

## Plenary Lecture

# Impact of communication on consumers' food choices

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Consumers' food choices and dietary behaviour can be markedly affected by communication and information. Whether the provided information is processed by the receiver, and thus becomes likely to be effective, depends on numerous factors. The role of selected determinants such as uncertainty, knowledge, involvement, health-related motives and trust, as well as message content variables, are discussed in the present paper based on previous empirical studies. The different studies indicate that: uncertainty about meat quality and safety does not automatically result in more active information search; subjective knowledge about fish is a better predictor of fish consumption than objective knowledge; high subjective knowledge about functional foods as a result of a low trusted information source such as mass media advertising leads to a lower probability of adopting these foods in the diet. Also, evidence of the stronger impact of negative news as compared with messages promoting positive outcomes of food choices is discussed. Finally, three audience-segmentation studies based on consumers' involvement with fresh meat, individuals' health-related-motive orientations and their use of and trust in fish information sources are presented. A clear message from these studies is that communication and information provision strategies targeted to a specific audience's needs, interests or motives stand a higher likelihood of being attended to and processed by the receiving audience, and therefore also stand a higher chance of yielding their envisaged impact in terms of food choice and dietary behaviour.

### Communication: Consumer: Food choice

Behaviour change is determined by a complex set of interlinked personal and environmental factors. Personal determinants relate to motivational, cognitive and affective processes in which psychosocial variables such as attitudes, norms, self-efficacy, skills and their underlying beliefs play a crucial role. Numerous factors associated with a person's physical, social and economic environment can further encourage or inhibit behaviour change. Although initiating and maintaining behaviour change is a difficult and complex process in which many different determinants are involved, there is little doubt that consumers' choices can be markedly affected by information. Communication and information provision efforts can have an impact in terms of changing consumers' knowledge, shaping their attitudes and redirecting their decision making, including food choices and dietary behaviour. The role and potential impact of communication related to food

products have gained considerable attention recently. From the demand side of information, consumers as well as retailers increasingly seek guarantees concerning food quality and safety, which has been fuelled at least partly by several consecutive food-safety incidents in Europe. Consumers seem to want information to help them derive more pleasure from food, to achieve a better diet, to avoid certain allergens or to know the origin and environmental, ethical and technological conditions under which the food has been produced and processed. Information about health and nutritional composition can be used by consumers in their evaluation of product alternatives and formation of quality expectations. As such, health and nutritional value are product attributes that contribute to determining purchase intentions and choice, but they are weighed heavily against other motives such as taste, price and convenience<sup>(1)</sup>.

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From the supply side of information, the food industry as well as other commercial stakeholders in the food chain face increasing competition and decreasing margins, in particular in the European food market, which has become subject to lower levels of protection, higher prices of raw materials and increasing international trade and globalisation. As a consequence, profitability through strategies that focus on product differentiation and market orientation, in which information and communication are key attributes and activities respectively, are more than before determining the industry's success. At the same time, government and public institutions involved with food and health policy have also become important players on the supply side of food-related information. Providing consumers with free, transparent, informed and safe food choices, as well as promoting a healthier diet and lifestyle, have been key commitments in European food and public health policies, most specifically within strategies against overweight, obesity and other lifestyle-related disease risks.

There has been a growing interest, not only in the role and mechanisms of information, but also in the evaluation of the various techniques and vehicles for spreading information. Much effort has been devoted to evaluating the effects of advertising and media coverage of food quality and safety issues, investigating the role of trust and credibility of information sources and analysing consumer interest in and use of available information cues. Despite a number of attempts to map the impact of communication, many issues relating to its exact working and effectiveness, as well as to information processing by the receiving audience, remain unresolved. For example, it has been shown that communication through providing simple dietary advice is not equally acceptable among a wide diversity of consumers, therefore hampering compliance with the communicated dietary advice<sup>(2)</sup>. Furthermore, nutrition interventions or promotion campaigns aimed at stimulating fruit and vegetable intake<sup>(3,4)</sup> or fish consumption<sup>(5,6)</sup> have had hardly any or only a modest success at best in terms of convincing consumers to effectively adapt their dietary pattern. Also, in the case of nutrition information on food labels, there is still little insight into how labelling information is or will be used by consumers in a real-world shopping situation<sup>(7)</sup>.

The aims of the present paper are to describe a selection of relevant determinants for the effective working of the communication process and the establishment of desired communication effects. It concerns factors that act as catalysts to information processing, which is a precondition to a campaign's effectiveness, and therefore also to be accounted for when designing communication and information campaigns. Fig. 1 presents the framework for the present paper, which is inspired by two streams of research with relevance to communication and consumer behaviour. The first component is based on classical transmission models of communication or information theory<sup>(8,9)</sup>. Such models basically propose that the communication process includes a sender, source or communicator who sends a message through a particular channel to a potential receiver or audience. The reaction or feedback by the receiver depends on the processing of information within the individual after being exposed to the information message. The

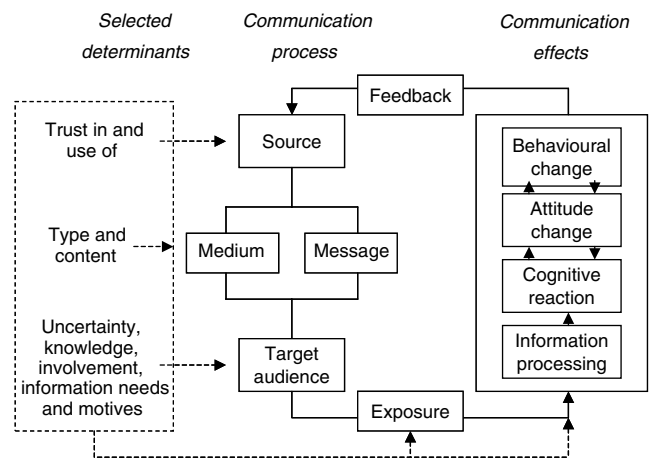


Fig. 1. Framework for the present paper: selected determinants of the communication process and its effects.

second component results from basic consumer psychology and behaviour models, which hold that information moves individuals through a sequence of stages, often referred to as a hierarchy of effects<sup>(10)</sup>. This concept indicates the different mental stages that consumers go through after being exposed to information and when responding to information and making buying decisions. While it is generally accepted that a structure including a cognitive response (learning, knowing), an affective reaction relating to attitude formation (thinking, feeling) and a behavioural reaction (intending, doing) is valid, the sequence and separation of these hierarchical steps depends on individual-related, product-related and situational factors<sup>(11)</sup>.

The present discussion will concentrate on selected determinants of the likelihood of information processing. First, it will be illustrated that it cannot be assumed that consumers will actively search for and process information or that they will pay attention to information and information cues, even if the objective is to reduce their uncertainty or improving their personal knowledge base when making food-consumption decisions. Second, particular attention will be paid to the impact of message type and content, as well as of different vehicles for information provision, such as negative press *v.* advertising. Third, it will be argued that consumers do not form a homogeneous market. Instead, audience segments with clearly different needs and interests can be identified, which calls for targeted information provision efforts. The arguments will be supported by empirical evidence from recent consumer studies dealing with meat, fish, fruit and vegetables and functional foods.

## Information processing, uncertainty and knowledge

### *Different modes of information processing*

Information processing is commonly depicted as a step-wise process, including several stages ranging from exposure, attention, comprehension and acceptance to retention of the message<sup>(12)</sup>. An important assumption in relation to information effectiveness is that consumers should be able

and willing to process information, ideally in a rational way, i.e. work systematically through the different processing stages before reaching a final judgement. In principle, rational consumers would not knowingly consume unhealthy or unsafe food. However, insights from cognitive psychology and behavioural economics have shown that the idea of the rational consumer who engages in active reasoning once he possesses all necessary inputs, capabilities and willpower is not true in many cases.

Different approaches to information processing have been presented. Two relevant ones in relation to food quality and nutrition information are the heuristic-systematic model<sup>(13)</sup> and the elaboration likelihood model of persuasion<sup>(14)</sup>. The heuristic-systematic model proposes two modes that individuals use to process information. The systematic mode is based on an analytical orientation in which individuals assess, investigate and integrate all useful information to reach their judgement. Systematic processing takes place when an individual encounters information of major personal importance or relevance. Conversely, the heuristic mode involves the use of simple decision rules or rules of thumb to reach judgements. Heuristics allow consumers to make fast decisions in complex situations, in situations of uncertainty or when their motivation to process information and think of potential consequences is low<sup>(15,16)</sup>. This type of processing is more likely to occur with low issue involvement. Also, limited cognitive capacity, low willpower or low self-interest explain why consumers prefer routine or habitual purchasing or the use of heuristics for active reasoning and extended problem solving.

The elaboration likelihood model holds that individuals process persuasive messages in one of two ways of information processing, the central route or the peripheral route. The central route is active information processing or high elaboration and involves in-depth processing of information. The peripheral route relates to low involvement and utilises external cues surrounding the information (e.g. the trustworthiness of the information source) to permit simple inferences about the merits of the message content without recourse to complex cognitive processing. The elaboration likelihood model conceptualisation has many parallels with the heuristic-systematic model, with systematic processing fitting with the central route and the use of heuristics corroborating with peripheral information processing.

Particularly in today's food environment, with consumers having relatively low levels of involvement with food and facing some time constraints as well as products with relatively low extents of differentiation, it is acknowledged that food-related decisions are often based on heuristics or follow peripheral routes of information processing<sup>(17,18)</sup>. In this context, brand image and corporate identity that are, for example, linked positively with health and nutrition are important assets because of their potential role as heuristics in consumers' information processing and decision making. This factor may explain why food products from a brand or company with a healthy corporate image have a higher probability of being perceived as healthy and nutritious relative to similar, or perhaps even healthier, products from brands or companies with a less-favourable health image.

### *Uncertainty arousing information processing?*

Uncertainty, risk, stress or threats to health and well-being make it profitable to spend more time and resources on acquiring information before decision making, and hence act as potential catalysts for information-need arousal and more active information search and processing<sup>(19)</sup>. In cases where consumers face uncertainty, an obvious solution seems to be the provision of more information. However, more information does not necessarily mean better-informed consumers, simply because information is likely to be effective only when it addresses specific information needs and can be adequately processed and used by its target audience<sup>(20)</sup>.

This point is illustrated by the experience from a campaign aimed at informing beef consumers about beef-quality labelling and traceability in Belgium<sup>(21,22)</sup>. On the assumption that consumers who face uncertainty as a result of consecutive meat and other food-safety crises<sup>(23,24)</sup> will be more prepared to engage in active information search and processing, the government and the food industry made information freely available for those consumers who felt a strong need for it. Consumer information campaigns were initiated together with the introduction of the mandatory beef-labelling regulation. A one-quarter-page coloured advertisement was inserted in twenty national newspapers and in four women's magazines. The advertisement included a free telephone number to call for an information leaflet about the traceability and labelling system. The impact of the campaign on consumer interest in information cues was measured by a pre- and post-campaign survey. Whereas the advertisement was found to succeed in terms of attracting consumers' attention to specific information cues, such as the quality label and indications of origin, the direct response component largely failed, with only 304 calls for the free information leaflet received as opposed to a target of 15 000. The failure of the direct-response component was explained by consumer involvement being too low and by reduced uncertainty between the period of campaign planning, shortly after the occurrence of the dioxin crisis in 1999 in Belgium, and the execution of the campaign >1 year later.

This case illustrates that it may be utopian to expect high direct-response rates, even in cases where consumers are supposed to be uncertain. Instead of engaging in active information search and information processing, an alternative and much easier solution was to stop beef consumption and substitute it with another protein source. This notion fits with the rationally-ignorant consumer hypothesis<sup>(25)</sup>, which states that even when information is free, it may be the most rational decision for consumers to remain ignorant. The reason is that the opportunity costs of information processing (i.e. costs related to the allocation of time, cognitive capacity and effort) are larger than the expected marginal benefit of the information, thus not providing any incentive for engaging actively in the processing of information.

### *Selectivity in paying attention to information cues*

The risk of information overload and potential adverse effects resulting from consumer indifference or

misunderstanding when confronted with too many information cues on the package or label has been clearly recognised<sup>(17,20)</sup>. Consumers are selective in paying attention to information in general and to information cues on food labels in particular. This selectivity has been demonstrated, for example, in the cases of meat<sup>(22,26)</sup> and fish<sup>(27)</sup>, for which information cues such as expiry date, species name, weight and price receive much higher levels of attention than health and nutrition information, and has been confirmed in a review of European consumers' response to nutrition information on food labels<sup>(7)</sup>. Although consumers generally indicate an interest in nutrition information, this particular interest is seldom among their top priorities in relation to food. Nevertheless, the review has indicated that interest in nutrition information is higher for processed products than for fresh products such as meat, fish or fruits and vegetables, and that this interest is higher if the time constraint is low<sup>(7)</sup>, which is one of the conditions necessary to arouse active reasoning. Taken together, the available evidence suggests that the processing of nutrition information requires more active reasoning, thus more systematic information processing, relative to other information that is apparently more straightforward in its interpretation, or more prone to the use of heuristics.

#### *Role of knowledge*

In addition, consumer knowledge is a relevant and important construct that influences how consumers gather and organise information and, ultimately, what products they buy and how they use them<sup>(28)</sup>. Although empirical studies investigating the impact of nutrition knowledge on dietary behaviour have produced mixed results, there is consensus that nutrition knowledge is a necessary, but usually insufficient, condition for adopting healthier eating patterns<sup>(7,29–31)</sup>. It is important to distinguish between two knowledge constructs: perceived self-estimated or subjective knowledge *v.* factual or objective knowledge<sup>(32,33)</sup>. Although findings about whether or not subjective knowledge is a better predictor than objective knowledge are contradictory<sup>(34)</sup>, there is a consensus that knowledge is a key construct in information processing. The potential impact of consumer knowledge, most specifically subjective knowledge, will be illustrated through two cases. The first is dealing with fish, the second with functional foods.

#### *Objective v. subjective knowledge about fish*

Consumers' subjective and objective knowledge about fish, as assessed in a pan-European fish consumer study, have been shown to differ markedly across consumers from different countries<sup>(35)</sup>. Danish consumers followed by Spanish consumers were found to have the highest objective knowledge about fish, with Polish consumers followed by Spanish consumers having the highest subjective knowledge. The percentage of correct responses to the statement 'Fish is a source of *n*-3 fatty acids' was found to vary from 68 in Poland to 91 in Denmark. On the other hand, it was found that between 67% (in Belgium and

Poland) and 40% (in Denmark) of the consumers wrongly believed that 'Fish is a source of dietary fibre'. Similar gaps in consumers' objective knowledge about fish have previously been reported based on a Belgian consumer sample<sup>(36)</sup>. Most importantly, subjective knowledge was found to be a better predictor of fish consumption as compared with objective knowledge. Furthermore, non-significant correlations between objective knowledge and fish consumption level were found in the two countries with the highest subjective knowledge, *i.e.* Poland and Spain. These findings suggest that the more consumers are convinced of being (subjectively) knowledgeable, the less their factual knowledge matters as a determinant of food choice and behaviour.

#### *Subjective knowledge and acceptance of functional foods*

In addition, the case of functional foods illustrates the potential impact of consumers' subjective knowledge. Based on consumer research in Belgium during 2001, it has been found that consumers' belief in the health benefits of using functional foods is the strongest determinant of accepting the concept of functional foods<sup>(37)</sup>, which is in line with the findings of other studies, *e.g.* in Finland<sup>(38)</sup>. Together with the belief in their health benefit, subjective knowledge about functional foods has emerged as an important determinant of functional food acceptance. However, in contrast with expectations, consumers with a high subjective knowledge have a markedly lower probability of adopting functional foods in their dietary pattern.

Further analysis has revealed that consumers' knowledge base about functional foods mainly results from mass-media coverage in the form of advertising, which is also their least trusted information source. It should also be noted that functional foods were still a relatively unfamiliar food category in the sense that consumer experience of these products was rather low in 2001, which may attenuate the negative impact of subjective knowledge in this case. This study illustrates the potential adverse impact of subjective consumer knowledge when this knowledge results from a source with a low perceived trustworthiness.

#### **Message type and content**

Specific message content dimensions, such as the message's tonality (*e.g.* transformational *v.* information) and directionality (*e.g.* self-directed *v.* other-directed)<sup>(39)</sup> (for discussion on health-motive orientations, see later), as well as the message's overall appeal to positive (benefits) *v.* negative (risks) outcomes determines its processing and effectiveness. A similar quantity of unfavourable news or negative news dealing, for example, with food safety risks weighs more heavily in consumer decision making than favourable news<sup>(21,40–42)</sup>, *e.g.* information concentrating on nutritional and health benefits. Consumers' expected value of additional information is higher when it concerns an issue with potential negative welfare effects than with positive welfare effects. This outcome links with prospect theory<sup>(43)</sup>, and more specifically the endowment effect<sup>(44)</sup>, which explains why economic agents attach a higher value

to potential losses than potential gains. Consumers evaluate the consequences of negative information about potential health risks at higher prices than could be expected from risk neutral or health benefit information.

In an initial study using time series analyses following the BSE crisis it was shown that beef TV advertising expenditures would need to be increased to about five times their mean level in order to maintain the beef expenditure share in the presence of a mean level of negative press<sup>(42)</sup>. A similar ratio between the impact of negative and positive news was also reported in previous studies<sup>(40)</sup>. The ratio of 5:1 is quite dramatic for those who are involved in bringing positive messages to consumers (e.g. messages appealing to health benefits), particularly as positive news is more expensive, working more slowly and fading away more rapidly as compared with negative news.

Also, an experimental communication testing study has investigated the potential impact of risk *v.* benefit communications, more specifically in relation to fish attribute perceptions and Belgian consumers' intentions to eat fish<sup>(45)</sup>. Fish consumers were exposed to either a benefit only, a risk only or a balanced message about fish consumption. The benefit only message, which stressed the nutritional benefits of eating fish because of its *n*-3 PUFA and vitamin D content, was found to increase consumers' intention to eat fish by 21% as compared with their current fish consumption level, while attribute perceptions were found to only marginally improve. The finding that fish attribute perception scores in terms of healthiness and nutritional value do not increase significantly, was attributed to a ceiling effect; the perception of fish as being healthy and nutritious is already so positive that it can only show a minimal further increase.

The risk only message, which stressed potential toxicological risks related to dioxin and methyl mercury contamination, was found to result in a very strong negative perceptual change, most notably in terms of health and safety perception, and to translate into an 8% lower behavioural intention. Finally, a balanced message referring to both risks and benefits, was found to yield no significant change in behavioural intention, despite a worsening of fish attribute perception.

These findings indicate that communication impacts differ markedly depending on the type of message and its content in terms of its appeal to risk *v.* benefit, as well as on the level at which this impact is assessed, notably attribute perceptions (i.e. changes relating to beliefs and attitudes) *v.* behavioural intention (i.e. changes relating to behavioural variables).

### Segmenting the target audience

#### *The need for audience segmentation*

As consumers are not all alike they do not react equally, systematically and predictably to information<sup>(46)</sup>. Apart from situational and product-related determinants, numerous individual characteristics such as involvement and knowledge, as well as attitudes, lifestyles and socio-demographics account for differences in information needs and reactions to communications. Information is most

likely to be efficient and effective when it meets specific needs of the target audience<sup>(47)</sup>. The finding that much of today's information about food is ignored and irrelevant to consumers is attributed to the fact that this information does not address the audience's needs and expectations<sup>(20)</sup>. Apart from its proven usefulness in commercial marketing areas, the importance of audience segmentation is increasingly acknowledged in social marketing as well, especially for designing tailored health marketing campaigns that are more responsive (and therefore more likely to be effective) to the individual needs and motives of well-defined target audiences<sup>(48,49)</sup>. Distinguishing between different types of consumers, in particular through segmentation studies on consumer interest in nutrition information, has previously been suggested as a crucial issue on future research agendas<sup>(7,17)</sup>. In line with this suggestion, the findings of three segmentation studies with relevance to communication and its potential impact on food choices will be discussed.

#### *Consumer involvement in fresh meat*

First, using different components of consumers' involvement in fresh meat as segmentation variables, differences in information needs have been identified for four distinct consumer segments<sup>(50)</sup>. Higher levels of involvement, i.e. personal importance attached to meat as a product category because of higher perceived pleasure value and/or higher perceived risks to human health, were expected to result in a greater depth of information processing and more extended decision making.

The first segment, typified as 'straightforward meat lovers', was found to include more men and daily fresh meat consumers who displayed a very low interest in external information. The primary focus of this segment was on taste and hedonic benefits of eating meat. Another segment was identified as 'indifferent meat consumers', for whom price was a major interest factor. These consumers were found to show the lowest involvement in fresh meat as compared with the other segments, which translated into the least-extensive decision-making process and a very low willingness to engage actively in information search and processing. The other two segments, both including more families with children, were found to be much more interested in information. The segment of 'cautious meat lovers' were involved in fresh meat both because of its pleasure value and high perceived risk. Their interest in information was mainly related to health and nutritional issues. Finally, the fourth segment was typified as 'concerned meat consumers'. This segment mainly included consumers who had strongly reduced their meat consumption because of safety concerns. Their reactions to information were characterised by a strong belief in negative press and mass-media reporting, as well as a considerable need to receive reassurance from personal information sources concerning meat safety and wholesomeness, e.g. from medical sources or trusted commercial sources such as their local butcher.

The findings from this involvement-based segmentation corroborate other studies that have concluded that all consumers irrespective of their involvement are interested in

tangible quality attributes like taste, while only the more- or highly-involved consumers may additionally demand intangible quality attributes, e.g. information related to credence qualities such as health or safety<sup>(51)</sup>. This case of involvement-based segmentation stresses the role and importance of involvement as a motivational force that stimulates information-seeking behaviour and information processing, and therefore also the potential effectiveness of communication. The fact that involvement-based segments with clear differences in information needs could be identified is an initial argument in favour of adequate segmentation and targeting in information provision.

#### *Health-motive orientations and fruit and vegetable consumption*

The second segmentation case relates to health motives in the context of fruit and vegetable consumption<sup>(39,52)</sup>. The proposition for study was that the only modest success of public health campaigns aimed at increasing fruit and vegetable consumption may be the result of a disregard of the possibility that the total population consists of a number of smaller subgroups with distinct need patterns. Based on this proposition that several subgroups may exist within a population for which health has another distinct meaning, a segmentation scheme using participants' health-related-motive orientations, i.e. psychological meanings that individuals attribute to health and that motivate health-related behaviour, has led to the identification of five consumer segments. These five segments could be organised along two bipolar dimensions, which represent an intrapersonal (emotional *v.* functional) and interpersonal (individualistic *v.* altruistic) health perception respectively.

Although it was found that the segments do not differ *a priori* in terms of fruit and vegetable consumption, they do react differently to targeted fruit and vegetable advertisement. In particular, all segments were found to respond more positively toward the health advertisement that was designed and expected to be most responsive to their underlying health-related-motive orientations, i.e. a transformational and self-directed message for the 'energetic experimenters' (who have a predominantly emotional and individualistic health orientation), a transformational and other-directed message for the 'harmonious enjoyers' (who have a predominantly emotional and altruistic health orientation), an informational and other-directed message for the 'normative carers' (given this segment's functional and altruistic health orientation) and an informational and self-directed advertisement for the 'conscious experts' and 'rationalists' (given these segments' functional and individualistic health orientation). Thus, apart from demonstrating the practical usefulness of this segmentation based on health-related-motive orientations in a food choice context, the study also shows that a segment's reactions to targeted communications (in terms of attitude toward the advertisement and behavioural intention in relation to fruit and vegetable consumption) are more positive to well-designed messages targeted to appeal to particular health motives as pursued by the individuals belonging to the specific segment.

#### *Use of and trust in fish information sources*

The third segmentation case deals with consumers' use of and trust in information sources about fish<sup>(53)</sup>. An earlier application of the idea of segmenting consumers based on their use of information sources has identified five segments that differ in terms of reported use of food-safety-related information sources, personality characteristics and socio-demographics<sup>(54)</sup>. In the study dealing with fish perceived trust together with source usage were added as segmentation variables<sup>(53)</sup>. Trust plays a crucial role in the utilisation of provided information. The value of information becomes zero, or even negative, if the information source itself is not trusted<sup>(55)</sup>. Thus, trust is an important antecedent to information processing and effectiveness in general. Trust can also act as a catalyst to the peripheral information processing route or as a heuristic for reaching judgements and making decisions more easily.

Three consumer groups, based on their use and trust in fifteen potential information sources about fish, were identified<sup>(53)</sup>. These three clusters were found to differ in their use of potential and existing information cues, behaviour toward fish consumption, knowledge about fish and socio-demographic composition, which yields opportunities for targeted information provision efforts.

The first segment, termed 'sceptics', includes consumers who are very passive toward trusting and using any information relating to fish. This segment was found to include more older and male consumers who had the lowest fish consumption level. From a public health perspective this segment represents a very relevant target for stimulating fish intake. However, this group is also the most difficult group to reach for communicators and marketers because of their genuine disinterest in any information about fish. 'Enthusiasts' were found to constitute the biggest consumer segment. They use and trust all information sources about fish. In general, they are the most interested in information about fish and they use information cues on fish labels quite intensively, including available nutrition information. This segment was found to consist of relatively more women than men. Finally, the third segment, 'confident fish consumers', was found to be the smallest segment, consisting of relatively more younger consumers who do not really use any information sources but have high trust in independent information sources such as government, scientists and consumer organisations. They simply 'trust the system'. This consumer group, together with the 'sceptics', was found to report a low fish consumption level. However, this group is the easiest group to reach for communicators and marketers because of their high level of trust in information sources.

Interestingly, this study has also revealed that there is no group of consumers who report very low trust levels, combined with high levels of use of information sources related to fish. This finding indicates that a minimum level of trust may be required before information sources are critically examined and used<sup>(55)</sup>. In the extreme situation of very low trust consumers are unlikely to examine information sources in any way, i.e. neither critically nor uncritically.

### Conclusions

Although consumers' food choices and behaviour change can be influenced by information and its processing by the target audience, the working and effectiveness of communication efforts cannot be taken for granted. In particular, messages promoting positive outcomes, such as health and nutritional benefits, face difficulties in effectively achieving their objective of establishing healthier food choices. Health and nutrition are weighed against other motives for food choice such as taste, price and convenience, and related information is spread in an environment characterised by increasingly fierce competition to gain consumers' attention, processing capacity and willpower. Numerous personal and environmental factors determine whether behaviour change is initiated and maintained. Likewise, many of these factors determine whether consumers are able and willing to spend time and effort on the processing of food-related information, which is a precondition for a campaign's effectiveness in terms of improving consumer knowledge, changing their attitudes and ultimately redirecting their behaviour. The present paper has discussed a selection of these determinants. Information processing is largely conditional on whether consumers perceive a real need for information, as well as a clear benefit from engaging in active reasoning and using the information provided. Such benefits may pertain to reducing consumers' uncertainty and improving their objective and subjective knowledge base, or to assisting consumers in making choices that better align with their actual preferences. Much of today's food-related information may be either irrelevant to or simply overloading consumers, and therefore risks resulting in ignorance, indifference, boredom or misunderstanding. Such information clearly fails to appeal to the needs, expectations and interests of well-defined target segments within the population. Invariably, the three segmentation studies that have been discussed, which were based on involvement, health-related-motive orientations and use and trust in information sources respectively, illustrate that consumers form a heterogeneous market composed of different segments with distinct information needs and information acquisition and usage patterns. These findings, supported by other segmentation studies<sup>(48,54)</sup>, as well as being reinforced by a strong call for further research efforts to distinguish between different types of consumers in relation to their needs and interests in nutrition information<sup>(7)</sup>, support the need for communication strategies that include the development of targeted information provision. Such efforts are expected to stand a higher chance of being attended to and processed by the receiving audience, and therefore also a higher possibility of yielding their envisaged impact in terms of food choice and dietary behaviour.

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