



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

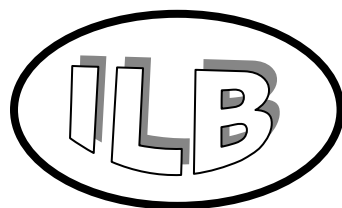
System Dynamics and Innovation in Food Networks 2009

*Proceedings of the 3rd International European Forum on System Dynamics and Innovation in
Food Networks, organized by the International Center for Food Chain and Network
Research, University of Bonn, Germany
February 16-20, 2009, Innsbruck-Igls, Austria
officially endorsed by*

*EAAE (European Association of Agricultural Economists)
IAMA (International Food and Agribusiness Management Association)
AIEA2 (Assoc. Intern. di Economia Alimentare e Agro-Industriale)
INFITA (Intern. Network for IT in Agric., Food and the Environment)*

edited by

M. Fritz, U. Rickert, G. Schiefer



The Role of Consumer Acceptance in the Food Innovation Process: Young Consumer Perception of Functional Food in Italy

Teresa Del Giudice¹, Stefano Nebbia² and Stefano Pascucci²

¹*Department of Agricultural Economics and Policy (DEPA) - University of Naples Federico II – Centro per la Formazione in Economia e Politica dello Sviluppo Rurale – Portici(Italy)*

²*Department of Agricultural Economics and Policy (DEPA) - University of Naples Federico II, Portici(Italy)*

Abstract

In this article we analysed the role of acceptance of a new food within innovation processes in the Italian food sector. Our analysis focused on preferences and the opinions expressed by three distinct groups of young consumers in relation to functional foods (FFs). Such products represent an innovation both in terms of technology and commerce for Italian food companies, and the segment of young consumers would appear especially interested in them. Our results showed that a different cultural education, hence the degree of knowledge cumulated by young consumers, is a key element in the preference for, and perception of FFs. This implies the need to identify highly differentiated marketing strategies for firms seeking to reach this segment of FF demand in Italy.

1. Introduction

The innovation cycle in the food sector is led by two driving factors: on the one hand we have the "technology-push" dynamic which implies a strong technological and know-how transfer from other sectors; on the other, we can find the "demand-pull effects" which are dependent upon consumer acceptance of new products (Grunert et al., 1997). Thus the capacity of a firm to transform a technological adoption into a real innovation is highly conditioned by effective market response. Food firms interested in using innovativeness as a competitive strategy have to constantly analyse the change in their target-consumer perceptions, tastes and preferences (van Trijp, Steenkamp, 2005).

One of the innovative aspects in the food sector is currently represented by functional food (Schaafsma, Kok, 2005). In Italy, although functional foods are becoming increasingly popular, with rosy forecasts of their future development and demand, there is still little understanding of how these foods are perceived by consumers and how the demand is segmented. In order to increase the chances of success in this market a food firm cannot afford not to broaden its knowledge on function food consumer perception, the cultural, psychological and social motivations under which he/she behaves (Urala, Lähteenmäki, 2003). It is important to recognise that consumers accept new products in different ways, and often the same product is viewed antithetically by two distinct groups of consumers. Moreover, the production of a new product frequently fails a few years after its introduction onto the market (Mark-Herbert C., 2003).

In this paper we analysed the preferences for functional foods of three groups of Italian young consumers with different "life-styles". A field survey was organised using a questionnaire to obtain all the information related to functional food consumption. On the basis of the work of Urala and Lähteenmäki (2003) eight main descriptors were selected which could be related to the main statements the potential consumer could give according to his/her preferences in a range of judgements from 1 to 7 (Likert scale). The descriptors give us the opportunity to con-

sider the main aspects related to functional food consumption such as customer satisfaction, familiarity with the product, consumer needs, perception of functional food as a drug, consumer diet, food risk, tastes and price.

The results allowed us to distinguish between the preferences of the three groups of consumers on the basis of their cultural and social profiles (degree of education, work experience, cultural values, etc.). Starting from these results we detected the main strategies which could be implemented by Italian food firms to enhance their ability to intercept the needs of this specific segment of the market (under 30) which seems to have an increasingly keen interest in consuming functional foods.

2. Functional foods: from “technology push” to “demand pull” innovations

2.1 Definition of functional foods

The concept of functional food (FFs) has rapidly extended in recent years and consumers have had little time to gain familiarity with the phenomenon. Functional food started in Japan with the undeclared aim of cushioning the health costs arising from the large percentage of elderly people among the population. To date, functional foods have not yet attained a precise definition within European law. Thus we may consider the definition coined by the European Food Information Council (EUFIC) still valid: “generally, they are considered as those foods which are intended to be consumed as part of the normal diet and that contain biologically active components which offer the potential of enhanced health or reduced risk of disease” (<http://www.eufic.org/article/en/expid/basics-functional-foods>, 2009). Anyway, to avoid any “misunderstanding”, we decided to refer to an operational definition of FFs given by a recent work of Doyon and Labrecque (2008) based on a review of the literature and the Delphi technique with a group of North American and European experts: “A functional food is, or appears similar to, a conventional food. It is part of a standard diet and is consumed on a regular basis, in normal quantities. It has proven health benefits that reduce the risk of specific chronic diseases or ill states in addition to its basic nutritional functions”. According to this definition FFs must remain foods and must show their effects if consumed within a diet in quantities which are considered normal; the mechanisms through which a functional food may model definite functions to contribute to maintain the state of health, must be scientifically demonstrated and supported by epidemiological data which prove the statistical validity of the positive effect (Bottazzi, 2004). Such foods must be consumed as an integral part of a normal food regime and the effects are obtained by consuming the same quantities thereof as those envisaged by a common diet.

FFs must thus be distinguished from enriched (or supplementary) and/or fortified foods. Fortified foods are intended to combat malnutrition occurring in broad sectors of the population. Cooking salt, for example, may be fortified with iodine, given that this mineral is essential for thyroid functions. By contrast, supplemental foods are those in which the concentration of a nutrient already occurring in natural food is increased. For example, cereal flakes usually already contain vitamins and minerals but may also be further supplemented since the refining process reduces the contents of such nutrients. FFs must not be confused with dietetic foods, which are aimed at individuals suffering from specific pathologies, while FFs target healthy subjects who wish to remain healthy. Further, dietetic foods are used upon specialist medical advice, while functional foods are purchased directly by the consumer. FFs are not *nutraceutical*, a term which was coined in 1989 by Dr. Stephen L. De Felice, combining the terms *nutrition* and *pharmaceutical* (De Felice, 1989). Nutraceuticals are products derived from foods or food raw materials sold in the form of pills, powders or other forms that have a proven effect upon a pathology or in disease prevention while functional foods are real foods. Nor does the term *nu-*

traceutical yet have a precise use context: currently nutraceuticals may also simply be used to cover all pharmaceuticals. Thus it would be misguided to speak of a functional food as a “food with nutraceuticals added”.

FFs are not supplements. The latter are products in the form of pills, powders or bars which aim to fill some nutritional lack so as to reach the daily dosage recommended for a certain substance. Being consumed in a different form from foods currently used, they lend no contribution to the digestion phase or the hedonistic phase of food consumption. Nor should functional foods be confused with diet foods, which are “lightened” foods, derived from traditional foods which undergo some variation in chemical composition so as to reduce their caloric content. This change especially concerns fats and carbohydrates.

FFs are not to be considered traditional foods insofar as the latter do not constitute an innovation (“the breakthrough”). Traditional health foods are commonly thought of as functional foods since they partly fall within the definition of functional foods. However, in preparing them modern food technology is not used; thus we may refer to them, in this context, as foods which the food industry uses as a starting point to create a functional food. It is therefore reductive to use the term traditional for foods which were created precisely to confer, as against traditional foods, an extra benefit for health (<http://www.eufic.org/page/en/nutrition/functional-foods/>).

The following food components make a food “functional”: beneficial micro-organisms, carotenoids (beta-carotene, lutein, zeaxanthin, lycopene), food fibre (soluble and non-soluble fibre), monounsaturated and polyunsaturated fatty acids (omega-3), flavonoids (anthocyanidin, catechins, epicatechins, flavanones, flavonols), isothiocyanates, phyto-oestrogens, plant sterols, stanols, vitamins, mineral salts, oligosaccharides (prebiotics), reduced sugars and others again. Examples on the Italian market include: probiotic foods (foods containing probiotic micro-organisms which, if consumed in a certain quantity, confer beneficial effects on health in addition to those which are intrinsic to general nutrition) and prebiotics (foods containing particular chemical substances which stimulate the growth of positive endogenous micro-organisms, thereby promoting the host’s state of health)¹. Hence what may be considered functional are also those natural foods in which components potentially non-beneficial to health have been modified (e.g. hydrolysed proteins in formulas for childhood to reduce the risk of allergies). While waiting for clear-cut legislation to be enacted, however, there is no harm considering as functional all foods which promote well-being, although it is worth recalling that functional foods claim to have a beneficial ingredient which, under normal and natural conditions, does not occur in the food product.

1. This category includes Activia, Actimel, Lc1 and many others; symbiotic foods (foods that contain both prebiotics and probiotics); eggs enriched with omega-3 fatty acids; fruit juices with added fibre, vitamins and mineral salts such as Parmalat Jeunesse juices enhanced with the Q10 coenzyme. The 5-colour Santal juices, enhanced with the extracts of grapeskins rich in polyphenols, might also fall within the definition of functional products; breakfast cereals with added vitamins, minerals, fibre and oils. Breakfast products which faithfully reflect the definition of *functionals* are not commonly found on the Italian market; what may be considered functional are those breakfast cereals in which the ratio between soluble and insoluble fibre has been changed thanks to food technology; bread and baked products with a high content of vitamins, minerals, fibre and folic acid. Pancor is an example of functional bread; products enriched in phytosterols such as Danacol; energy drinks like Red Bull; low fat content milk with added fibre, vitamins, minerals, fibre, folic acid and polyunsaturated fatty acids. Examples are Parmalat milk with added omega-3 or milk to reduce hypertension (Evolus) not yet common on the Italian market.

2.2 The technological implications

Technologically speaking, there are three strategies that may be used to create a functional food:

1. change the macro- or micronutrient contents of the raw material;
2. change the technological process;
3. change the recipe.

With reference to the first point, the intervention is carried out on the raw material, animal or plant, so that it may have different compositional characteristics from its conventional counterparts. This may be achieved, for example, by varying animal diet (as in the case of hens that produce eggs rich in omega-3 fatty acids).

As regards the second point, during preparation of the food in question physico-chemical operations or fermentation may be carried out which generate compounds with biological activity or, by modifying the raw material, improve its functional characteristics. For example, the functional characteristics of cereal fibres may be considerably modified during the extrusion-cooking process; thermal treatment may make some compounds more bioavailable, as occurs with carotenoids in tomato products, or generate new ones, as occurs with the products of non-enzymatic browning which form in bread or coffee, while fermented soy sauces have a greater antioxidant capacity than fresh sauces due to the formation of ortho-hydroxy phenols during fermentation.

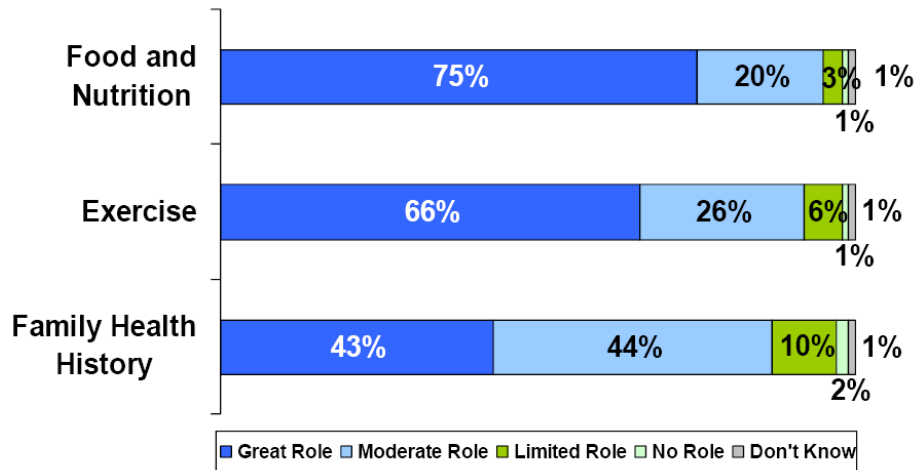
The simplest and most widely used way to create a functional product is undoubtedly the third strategy, i.e. adding to a conventional food base an ingredient with known beneficial properties. In this case, it is essential to ascertain that the ingredient added does not compromise the sensory quality of the product; for example, soya proteins in cereal products lead to a decline in product quality (Esposito et al., 2004). It is of fundamental importance to allow for possible interactions between such substances and other components naturally occurring in food or which are added at the same time. It is also indispensable to assess the bioavailability of the added component, i.e. its real use by the organism, better defined as the percentage of total content absorbed and then used by the organism for its specific functions. It may then be necessary to protect the added ingredients to ensure their stability during product preparation and shelf-life. A particular example is the contemporaneous addition to functional milk of both polyunsaturated fatty acids and antioxidants (vitamins) which, besides contributing to greater functional effectiveness of the product, ensure protection for PUFAs, that are particularly sensitive to oxidation. In research terms, functional foods thus represent an excellent field of play for food technologists, in a sector where their skills intersect with those of doctors, biochemists and nutritionists. The union of these diverse skills is essential to obtain innovative products that are actually useful for maintaining well-being, with the same quality standards as their conventional counterparts which are, sensorially speaking, the main point of reference.

2.3 Consumer acceptance: analysis of Italian FF market trends in the global scenario

The present-day marketing of food products focuses decidedly on the health implications of their consumption (Schaafsma, Kok, 2005). Along with Americans and Japanese, European consumers are well aware that, together with physical exercise, a proper dietary regime is the most important factor for maintaining a satisfactory state of health (fig. 1). Demographic trends and socio-economic changes, as we saw in section 1, also make it necessary to have access to foods endowed with more beneficial properties.

The increase in life expectancy, which has led to an increase in the number of elderly people

and to a desire for an improved quality of life, and the consequent rise in health care costs have driven politicians, researchers, health care professionals and the food industry to seek a way to manage such changes more effectively. In Western societies the perception of food as a nutrient is now flanked, if not overtaken, by that of food as a promoter of well-being. Functional foods represent one of the most interesting responses that the food industry can supply to the demand for health tied to food consumption (Fogliano, Vitaglione, 2005).



Source: IFIC, 2007

Figure 1. Results of a survey of US consumers on factors that contribute to improving and maintaining a good state of health

While the issues concerning the legal aspects and definition of characteristics that go to make up a functional food are still under discussion, and are likely to be for some time, this sector has seen an increase in sales in all industrialised countries (fig.2). In Europe the release of functional products onto the market has been a major novelty. The dairy sector has been radically changed by the introduction of probiotics, but also for oven-baked products, soft drinks and baby foods the number of new products launched is considerable, even if the failure rate remains high. Functional foods are thus proposed as foods which promote well-being and their market is growing. Suffice it to think that scientific validation of a particular food's therapeutic properties is a very powerful marketing tool insofar as it can be used as a specific message for advertising and information campaigns, a highly effective, appealing message for the average consumer.



Source: www.igd.com/1145

Figure 2. The world market for functional foods in the last decade

Annual research conducted by the IFIC since 1996 (IFIC, 2002; 2005; 2007) through focus groups and telephone interviews shows that demand for functional foods continues to rise (Schmidt, 2000) and this positive trend is also observed in Italy and Europe as a whole where consumers are increasingly determined to look after themselves without resorting to the use of medicine (Soldi, 2007). According to the estimates of some international research centres, total sales were expected to reach 5.7 billion euros by the end of 2007, 12% of which would be made on the Italian market (Lunati, 2004). These are forecasts which must be viewed with great caution and which should be used as simple indicators of a trend (Lunati, 2004). The global market was estimated at around US\$ 32 billion in 2002 and has risen ever since, given that new functional foods are frequently launched (Urala, Lähteenmäki, 2003). The market for these foods is thus in continual expansion and every year the list of products authorised by the government with the FOSHU logo lengthens. Japan is the largest market for the consumption of functional foods with a market of US\$16 billion, a per capita expenditure of 126 dollars per year, against about 68 dollars per year (42 euros) in Europe. Since 1990, over 5500 new functional foods have been introduced onto the Japanese market. The sector has grown by about US\$ 4 billion (Gianfelice, 2005).

However, the distribution and spread of functional foods is still very uneven among European countries and often it is so even within the individual country. Moreover, in a study carried out on 950 participants it emerged that there is great confidence in information concerning health from the competent authorities but also from the press, large shopping malls and food sector employees (Urala, Arvola, Lähteenmäki, 2003). In understanding how the attitude of consumers towards functional foods is formed, the first step is to identify the sources of information. Studies have revealed that information comes exclusively through the media which reach all market segments. Media information channels include television, radio, magazines, newspapers and messages via the Internet. A decisive element for consumer confidence is the involvement of a nutritionist, or at least a specialist in the sector, who illustrates the functional food and lauds its properties (Mark-Herbert, 2003). This is important because consumers need experts directly working in the field, since they receive information on the properties of such food more often in the form of advertising to increase sales rather than as quality information.

The strict correlation of functional food consumption with food habits means that the development of the “functional” type of product varies greatly across countries. Marketing has to bear

in mind that habits, cultural substrata and traditions are the main factors influencing a population's food choices. The Japanese, for example, praise the functional properties of drinks while the US consumer prefers the enrichment of solid foods, cereals, milk products, eggs and even ready-made meals. Finally, one of the main problems currently encountered by producers of functional foods is the lack of a precise definition of them; many terms overlap in the consumer's mind, creating only confusion (nutraceuticals, therapeutic foods, pharma food, etc.).

The ability to anticipate and respond suitably to consumer food demands is thus essential for ensuring the long-term survival of agri-food firms in a market which has become increasingly competitive and which acquires ever greater professional skills at the forefront of research. In addition to this component, food companies must be able to implement a policy of corporate social responsibility, a policy for consumers. A rapport of trust with consumers has to be created, offering them a broad range of safe, reliable products, thanks to continuous attention to the quality of the raw materials used, controls throughout the production process, commitment to research and development, and the rapport of partnership established with suppliers. What should lastly be considered are all the components that affect consumer behaviour when the food product purchase choice is made.

In 2003 the market for functional foods in Italy concerned chiefly drinks, oven-baked products, snacks and dairy products. The foods that have the best development potential appear to be those that have a beneficial effect on the gastro-intestinal environment, hence prebiotic, probiotic and symbiotic foods. To appreciate the market potential for functional foods in Italy, we may illustrate the food habits of the Italians with data from research conducted by Censis, commissioned by the Italian Academy of Cookery (AIC) on the occasion of its 50th anniversary. The research showed that while 22% of European consumers (with peaks of 30-40% in Northern Europe) stated they had recently changed their style of diet, Italians appear to be the most «traditionalist» in Europe, coming last in this particular category with a score of 15% (heading the list was Sweden with 43%, followed by Denmark and the Netherlands with 31%). However, Italy is not totally immobile and, judging from ISTAT data, we note that there has been a progressive change in consolidated food habits (just take, for example, the decline in daily pasta consumption or the introduction of new protein foods (fish products). There was an increase of 11.7% in the period 1995-2005 in the Italian habit of having a suitable breakfast in which not only tea or coffee but also milk is drunk and something is eaten (78.5% of Italians, more frequently women, children between 3 and 10 years and the over 65s). The habit of eating between meals is increasing (40% of Italians say they usually have a snack mid-morning and/or mid-afternoon), which testifies to the major dietary change in the traditional day. For 70.2% of Italians lunch remains the main meal of the day although its power of aggregation has declined against the rival attraction of personal interests (shopping, fitness, Internet use, etc.). There has also been an increase in the percentage of Italians (21.9%) who consider dinner the main meal of the day (+3.4% more than 1995).

Italians continue to be fond of foods able to satisfy dietary and health requirements: in the last two years, to satisfy consumer demands, over 4000 products have been reformulated, reducing or eliminating saturated fats, cholesterol, salt and fatty acids. Research shows that 24% of overall sales in the food industry come from innovative products, especially ready-to-eat foods (packaged vegetables, ready sauces, fresh condiments, frozen food, etc.). The classic foods of Italian tradition account for 66% of total sales. The remaining 10% is covered by typical products and organic food. Lastly, 17% of consumers state that they buy functional foods, which account for 700 million euros on the Italian market (Europe-wide this figure is 5.7 billion euros). In general, Italian consumers show they have developed a balance between the minimum quality required and family resources to be allocated to food and drink. However, if the quality and price of goods correspond to the first two factors of consumer choice (39% and 32% respectively), a far from secondary role is played by the impression of the freshness of what is

purchased (20%) and by product safety (16%). Flavour comes fifth (14%), followed by the healthiness of food (12%). Some point to food habits and preferences (10% and 11%), while a smaller percentage opt for brand, production method and country of origin (7% each). In 1975 food consumption accounted for 34.4% of family outgoings. Today, faced with resources to be split between the home (rent, mortgages, maintenance, taxes), transport (daily trips, weekends, travels and holidays) and services in general (health, education, communication, culture and free time), expenditure on food has fallen to 18.9% (ISTAT) and is even below 15% if alcoholic beverages are excluded (Eurostat, 2006).

3. Case study: the preference of young Italian consumers for FFs

3.1 Scope

Although functional foods are becoming somewhat popular and all the future predictions of their development and market growth are extremely positive, relatively little is known of how they are perceived by consumers. To enhance the potential in this growing market it is logical to think that the industry should really know the reasons that drive consumers to choose functional foods, how they justify their choice, and to what extent their interest is tied to their values and their basic culture (Urala, Lähteenmäki, 2003). Consumers accept new products in different ways, and the same product is very often perceived in opposite ways by two distinct categories of consumers. Moreover, the sale of some products very often stops a year after their release onto the market (Mark-Herbert C., 2003). Hence, to be able to develop such products in the future, the research of marketing experts is essential and constitutes the starting-point for food companies which must invest in launching new products.

In practical terms we sought to ascertain how far the propensity to consumption, the general attitude and the perception of safety related to functional foods were linked to the underlying culture and previous experience. We also sought to understand whether there is a divergence of opinion between groups of young consumers according to their cultural background, especially whether the consumers with a scientific background are more inclined towards such foods. We also investigated how much confidence there is in information generally and in what types of information and how willing they are to learn more about functional foods and examine them in depth. The general objective of the survey was to analyse the consumption behaviour of functional foods in the market segment consisting of the under-35s and therefore to identify the main strategic tools to promote and market functional foods, while the specific objectives were to examine, in terms of consumer characteristics, the role of knowledge and information in purchase behaviour, and the role of food habits and, with regard to product characteristics, the influence of product attributes and functions and hence production technology, the trade class, sensory characteristics and the main function of the functional product.

3.2 Methodology

A direct questionnaire survey was the method adopted to investigate the attitude of young Italian consumers to functional foods. During the set-up phase it was necessary to test its validity and effectiveness by administering it to various people who were totally unaware of the project, hence impartial. On the basis of their judgements the questionnaire was modified several times. Abstruse terms which were uncommon in current Italian, such as health claims and pharma food, were eliminated and replaced with other expressions which nonetheless rendered the concept. The questionnaire was administered to three groups of 50 subjects each: consumers with a humanities background between 22 and 30 years old (average age: 25.14), consumers with a scientific background between 22 and 30 years old (average age: 25.58) and young

employees between 25-35 years old without university degrees but with high-school diplomas (average age: 28.92). Together with the questionnaire, they were shown some functional foods “in the flesh” so that the consumers could be more familiar with the question: Actimel, Activia, Parmalat Jeunesse, Danacol, milk with omega-3 and Red Bull. The questionnaire may be clearly separated into two parts: in the first warm-up part our interest was to capture the degree of sensitivity of the interviewees towards the subject of nutrition and well-being; in the second part the subject of functional foods was tackled directly. From the first part we expected confirmation of certain points: scant familiarity with the concept; confusion in appraising all the categories of novel food, hardly ever frequent consumption of such foods. The first part, with the aid of real foods which the interviewees could touch and, if they thought it appropriate, taste, was the most appealing and responded very well to the aim for which it was devised. In the second part we decided to use eight large descriptors for functional foods, in accordance with an interesting Finnish study (Finland is at the forefront in promoting and developing functional foods) by Urala and Lähteenmäki (2004). The descriptors are based around some statements which the consumer, applying a score from 1 to 7, must indicate to what extent they are part of his/her thinking. The descriptors chosen allow us to consider everything that the person-in-the-street might think on such foods. There are eight in all and are in the following order in the questionnaire:

1. Degree of satisfaction derived from using functional foods;
2. Confidence in functional foods;
3. Necessity of functional foods;
4. Proximity of functional foods to medicine;
5. Functional foods as an important part of a healthy diet (their contribution to a healthy life);
6. Absence of nutritional risk in functional foods;
7. Taste of functional foods;
8. Price of functional foods.

Seven statements make up the first descriptor and they are all positive. This scale includes statements that describe the degree of satisfaction deriving from the actual use of functional foods. All were able to respond as all the interviewees except for one consume or have consumed, at least once, a functional product. It includes statements that specifically reflect the strictly personal sentiments of the individual. The key point of this descriptor is that using functional foods improves one's health and performance, and constitutes an effective way to look after oneself. Consumers who gave higher scores perceive greater satisfaction from using functional foods than those with lower scores.

The second descriptor concerns confidence in functional foods and includes statements that describe consumer attitudes towards claims and information on the health effects of functional foods. In other words, this descriptor seeks to understand to what extent individuals trust information and to what extent they believe in the scientific basis of the alleged health effects. What emerges from this descriptor is also how much they appreciate the advances that scientific research has made in recent years in the food sector. While functional foods may be criticised from several angles, it is undeniably appealing to be able to isolate an ingredient from a food and insert it into another food without the risk of creating a genetically modified organism. In this descriptor we inserted some negative statements where the consumer had to give the opposite score to that given for the other statements. The third descriptor concerns the necessity of functional foods and describes how essential functional foods are thought to be for themselves and for the population in general. This descriptor only describes the general need for functional

foods and makes no reference to any pathology. The usefulness of functional foods also emerges thanks to the presence of negative statements, inserted with the same purpose: to make the consumer reflect and check his/her consistency.

The fourth descriptor concerns functional foods and medicine, and seeks to detect how far, in the collective imagination, they are viewed as surrogates for medicine, to what extent foods must always differ from drugs and whether these two categories may have the same fields of action. The fifth descriptor is called *functional foods as an important part of a healthy diet* and seeks to understand to what extent it is thought they can play a decisive role in building up an optimal state of health. What is emblematic here is the question concerning people who should be in better shape if, *ceteris paribus*, the only thing that distinguishes them is the frequency in their use of functional foods. The people who responded with high scores believe that the use of functional foods may afford protection against an unhealthy diet.

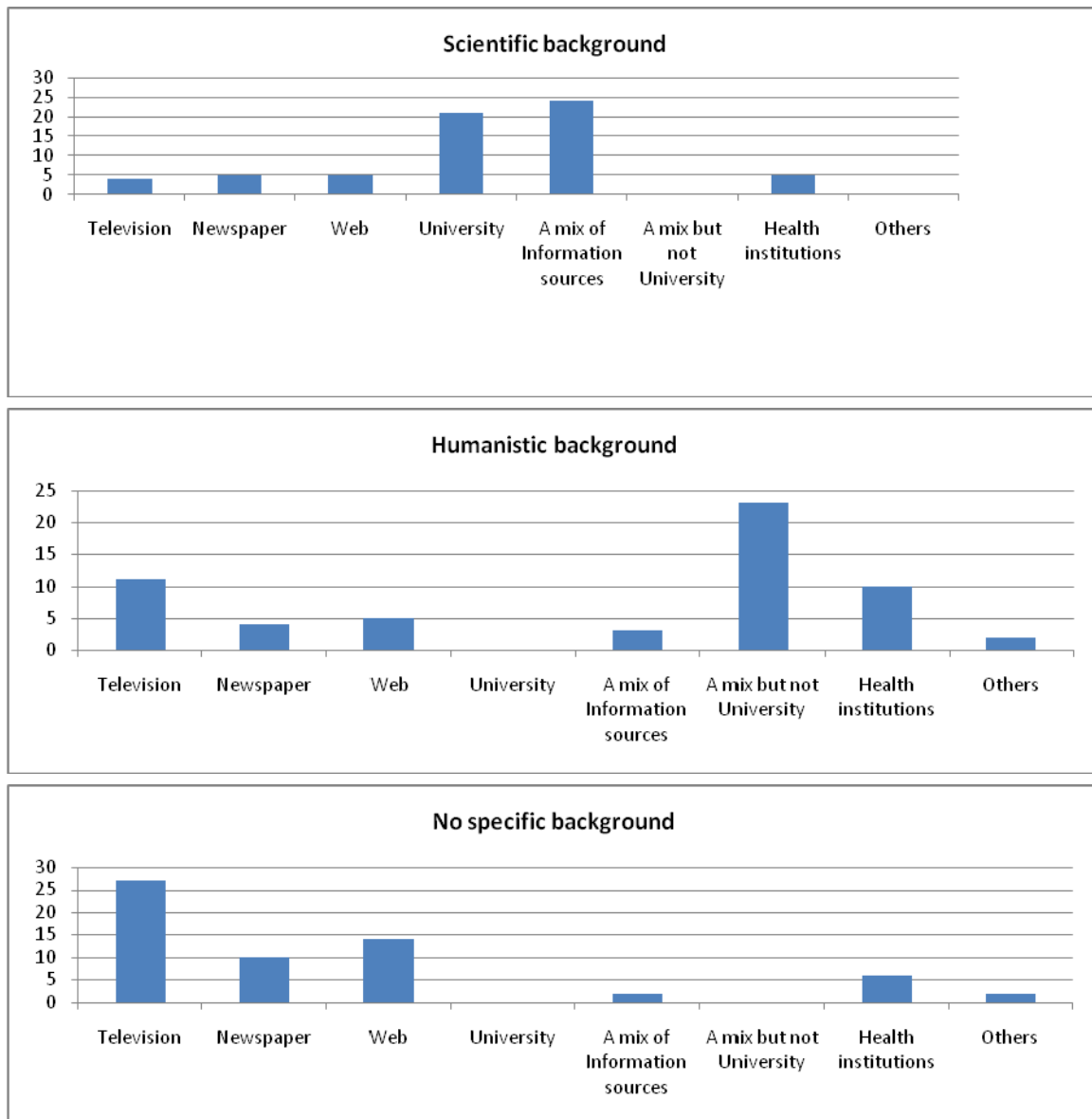
The sixth descriptor concerns the absence of nutritional risk in functional foods. This dimension describes the interviewees' suspicion of there being possible harmful effects in functional foods which may also stem from their excessive use. If they think that the release onto the market of such foods has been extremely rapid, to ensure survival in an ever more competitive market, then they will think that this could lead to unforeseen risks. The third question includes the two options. Those who gave higher scores think that there may well be health risks. The seventh descriptor contains statements that explore the relationship between food flavour and health effects, and describes how willing consumers are to give up the good flavour of a food if the latter is functional. It indicates, for example, how willing they are to drink chicory juice with added omega-3 only because the product is functional. The eighth and last descriptor explores the perception of price of such products. It detects to what extent functional foods are perceived as the most expensive in their categories (e.g. of all yogurts, functional yogurt is the most expensive), how much they are willing to pay and also how far they are willing to overlook price for ascertained product quality.

In the categories we inserted not only positive but also negative statements. The purpose was to force people to reflect and not simply give a response because they liked the number or because they were for or against in principle. Besides, such questions would serve to verify test consistency.

4. Results

What emerges from the first part of the survey is widespread knowledge of the new way of viewing diet, which may be summarised by the motto "eat to keep fit" and no longer just "eat to live". Of those interviewed, 87% (131 out of 150) felt they agreed with this new view of diet. Consumers with humanities and scientific backgrounds draw on different sources of information while employees prefer television, although it is important to stress, for the development of marketing strategies, the presence of the Web, which may well become an important means to reach technologically less well-informed consumers.

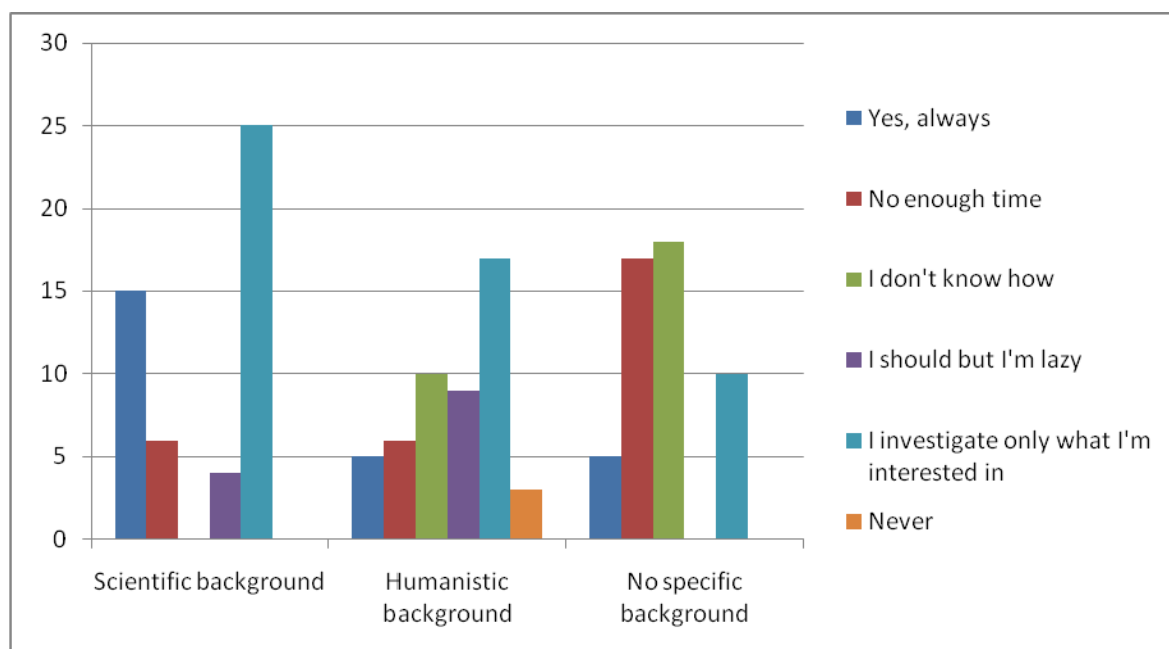
As a whole, the consumers interviewed were well-informed and attentive to health and their food habits: 30% of consumers with a scientific background always investigated the information while only 10% of arts consumers and those with no specific cultural background explored such subjects; 12% of the first two groups knew how to get more details but stated they did not have the time while 34% of those with no specific background stated they had no time; no consumer with a scientific background stated they did not know how to get more details while 20% of the arts consumers and as many as 35% of the non-university students stated they did not know how to investigate the information. Half of the science consumers, 34% of the arts consumers and 20% of the third group stated that they sought more details selectively: they only investigated what interested them (fig. 4).



Source: own elaboration of field survey data

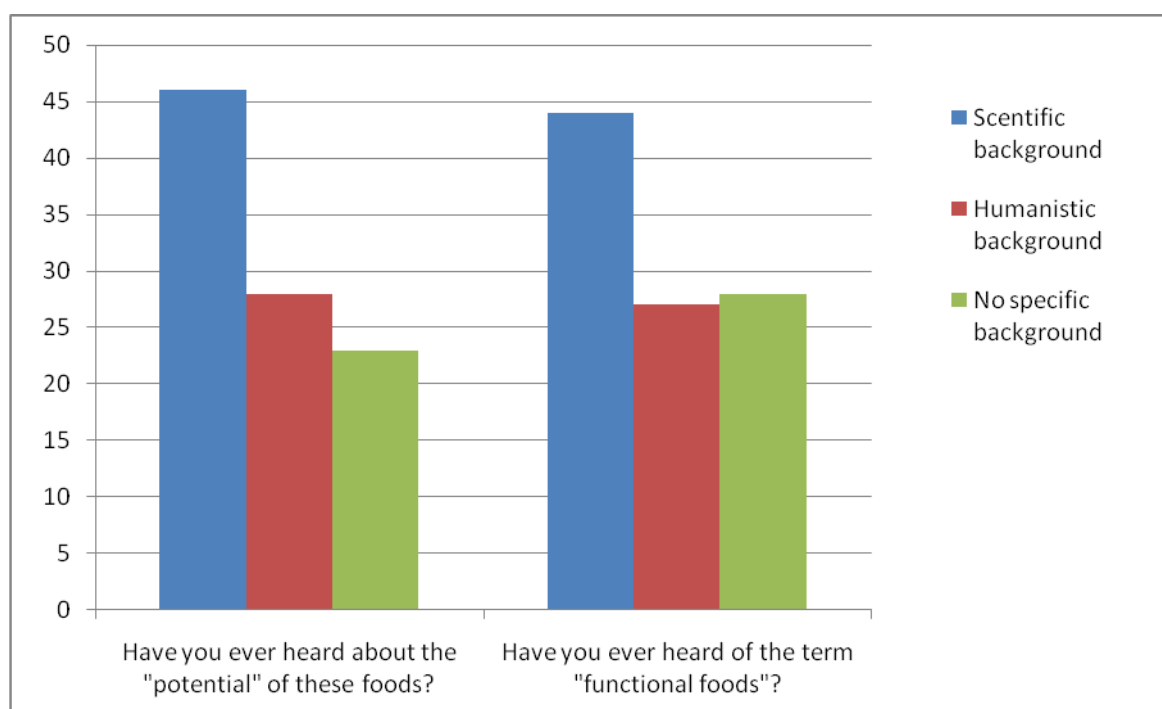
Figure 3. Source of information for the three groups of consumers

However, the term *functional food* is not yet universally known: 33% of the sample stated that they had never heard it used. In choosing what might be, in their opinion, the same thing as functional food, the responses varied greatly (42% considered them fortified). This question was formulated after explaining what really was a functional food. General confusion on the term thus remains, which is also an indicator of general confusion on all new food products. While this may be explained by the lack of unanimously accepted definitions, it is an indicator how consumers are interested in what the product is used for rather than how it is made. The sample interviewed knew the functional foods found on the market, and some of these such as yogurt with probiotics and Red Bull are widely consumed.



Source: own elaboration of field survey data

Figure 4. Tendency to investigate information about food

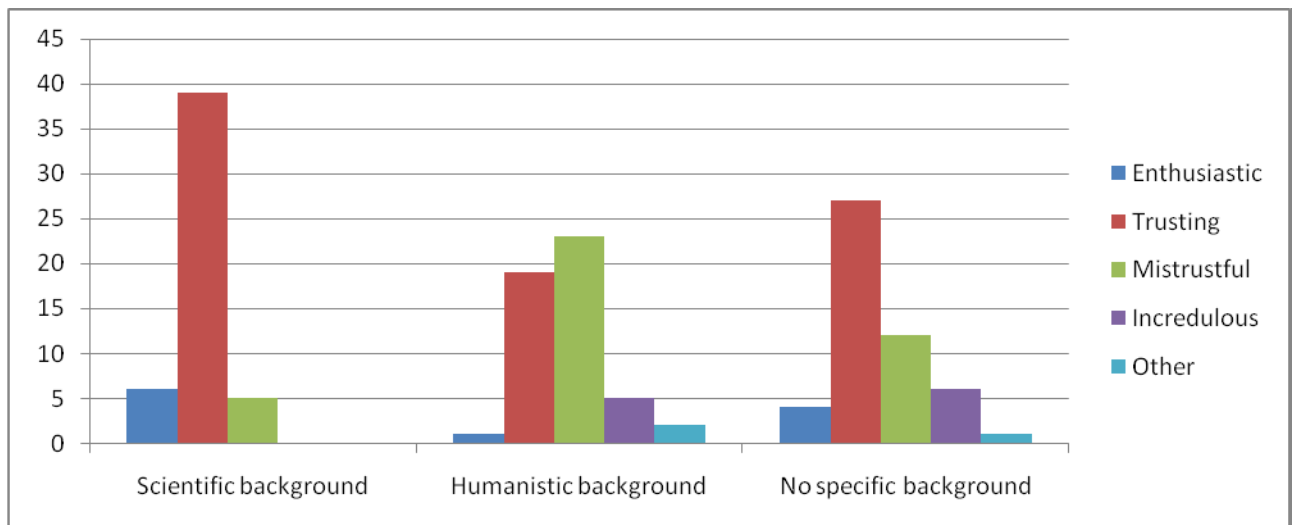


Source: own elaboration of field survey data

Figure 5. Consumer knowledge of food promoters of health and the terms “functional foods”

A quick opinion was then asked on this type of food. The group of consumers with a science background was that with the most trust in the capabilities of such foods: 12% were enthusiastic, 78% trusting and only 10% mistrustful; those with a humanities background were much less trusting: only 2% were enthusiastic, 38% trusting, 46% mistrustful and 10% incredulous (they did not believe that a food could bring about health benefits); the consumers without a specific cultural background showed a more positive attitude than the second group: 8% were enthusi-

astic, 54% trusting, 24% mistrustful, and 12% incredulous (fig. 6).



Source: own elaboration on field survey data

Figure 6. Assessment of FFs by the three groups of consumers

The most interesting observations emerged from the second part of the questionnaire. In general, analysis of the opinions allowed assessment of the sample's preferences in relation to the interpretation applied. The various opinions expressed by the three groups of consumers on the eight descriptors selected were compared to statistically determine the difference in opinions/preferences expressed (table 1). The results indicate a statistically significant difference between groups for all the descriptors except for those concerning the role of taste in choosing FFs and partly the degree of familiarity/knowledge thereof.

The most interesting facts that emerged, group by group, are as follows: consumers without a specific cultural background are willing to try less well-known products if they are functional while the other two groups still seem tied to "fashion" foods. In our opinion, the family of origin plays a role in food choice while consumers without a specific background, who also work and are older on average, are less influenced by family food habits. The latter also believe that, with the aid of functional food, they can considerably improve their performance. However, all three groups state they have a high degree of satisfaction resulting from the use of such foods. As regards the role of knowledge of functional foods, the consumers with a scientific background, by virtue of their greater technical knowledge, showed greater confidence in the information given and more appreciation of the scientific progress behind a functional food. Functional foods were necessary (descriptor 4) for the three groups, but also in this case those with a scientific background proved a step ahead. The latter group and the arts group eat more foods which have the same effects as pharmaceuticals while those with no specific background were more sceptical. They in no way accepted that medicinal products could be replaced by food. The science group felt it was not unwise to add health effects to non-healthy food, and assigned an important role to FFs in a healthy diet; consumers without a specific background held that too much functional food was extremely detrimental to health. In short, the latter were neither afraid nor suspicious of new products but they were very distrustful of advertising and the information given. This is also due to the fact that many in this group are unable to appraise the information received; students of agriculture were those most reluctant to give up taste; all three groups thought FFs were the most expensive in their respective categories.

Table 1. Analysis of assessment differences between different groups of consumers

| Descriptor | No. of cases | Groups | | | Levene statistic | Sig. | One-way ANOVA ^a | |
|--|--------------|--------------------|-----------------|------------------------|------------------|------|----------------------------|------|
| | | Science background | Arts background | No specific background | | | F-stat. | Sig. |
| Degree of satisfaction from using FFS | 150 | 4.57 | 4.06 | 4.78 | 20.76 | 0.00 | 7.90 | 0.00 |
| Degree of knowledge | 150 | 4.06 | 3.77 | 3.85 | 1.30 | 0.27 | 3.07 | 0.05 |
| Needs for FFS | 150 | 3.93 | 3.63 | 3.83 | 2.55 | 0.08 | 4.72 | 0.01 |
| Closeness to medicine | 150 | 4.11 | 3.99 | 4.52 | 2.95 | 0.06 | 5.32 | 0.01 |
| Contribution to a healthy life | 150 | 3.94 | 3.32 | 3.92 | 2.98 | 0.05 | 10.66 | 0.00 |
| Relevance of absence of nutritional risk | 150 | 3.43 | 3.39 | 4.91 | 0.47 | 0.63 | 25.05 | 0.00 |
| Taste | 150 | 3.85 | 3.57 | 3.67 | 1.82 | 0.17 | 1.01 | 0.37 |
| Role of price | 150 | 5.50 | 5.02 | 5.94 | 1.10 | 0.34 | 13.65 | 0.00 |
| Global assessment | 150 | 4.18 | 3.85 | 4.43 | — | — | — | — |

a. One way ANOVA for the equality of means and Levene's test for equality of the variance were used. When Levene's test was significant, a Brown-Forsythe statistic was used that does not assume equality of variance.

Source: own elaboration of field survey data

5. Concluding remarks

In conclusion, although functional foods may be said to be consumed quite widely among the young, the degree of knowledge and information concerning this food type plays an important role in the choice of purchase. Sensory characteristics in the world of young people play a fundamental role in purchase choices. Indeed, the three groups are reluctant to compromise the flavour of a food for its functional characteristics. Technological characteristics appear to have no particular appeal and are not decisive in food choice. The commodity sector is also important, given that functional foods fall within all food categories. Our view is that these foods should not be considered separately since they occur in all food categories and, as emerged in the study, a functional food in one category is accepted and consumed very differently from one in another category. Lastly, the problem of health, thanks to continuous appeals from various quarters, also affects the world of the young and there is great trust in those products which promise well-being. The general attitude towards such foods is undoubtedly positive.

In terms of marketing strategies, some remarks should be made on possible public and private interventions. In general, the level of consumer awareness is not yet such as to clearly identify a specific segment of functional foods. The existing confusion means that generic health products still compete with functional foods. They therefore need to be promoted generically, with the aim of making functional foods recognizable, avoiding the straightforward replacement of these products with others. However, public and private interventions must have *information* as the dominant strategy. Though it appears we are saying nothing new, today information on which to structure marketing strategies must be constructed with more rigour than in the past.

In other words, the greater degree of knowledge possessed by modern consumers, the various food disasters which have occurred in recent years (BSE, bird flu etc.), the high degree of innovation possessed by functional foods and, lastly, the impact that they could have on health make

the use of information necessary, provided that the latter is credible. This demand, increasingly expressed by a modern society continually on the verge of a crisis of collective panic, represents the real future challenge of agri-food marketing in the case of new products and those of higher quality. This aspect opens up new scenarios for promotion strategies where strong brand or price policies no longer seem able to ensure growing market shares.

Acknowledgements: The research for this study was supported by the Centro per la Formazione in Economia e Politica dello Sviluppo Rurale (Portici, NA)

References

- Bottazzi, V., (2004), *Latte fermentati funzionali probiotici- nuove opportunità per il benessere dell'uomo*, Elite Communication Srl, Milan.
- Doyon M., Labrecque J. (2008), Functional foods: a conceptual definition, *British Food Journal*, Vol.110 n. 11, Emerald Group Publishing.
- Esposito F., Fogliano V., Gennaro L., Napolitano A. (2004), *Ideazione e sviluppo di alimenti funzionali. Ingredienti alimentari III*, pp. 29-34.
- Fogliano, V., Vitaglione P. (2005), "Functional Foods: Planning and development", *Mol. Nutr. Food Res*, 49, pp. 256-262.
- Gianfelice C., (2005), Foshu: ovvero gli alimenti funzionali, *Natural 1*, pp. 60-65.
- Grunert, K., Hermesen H., Meulenberg M., Kuiper E., Ottowitz T., Declerck F., Traill B. and Göransson G., (1997), "A framework for analysing innovation in the food sector", in Traill, B. and Grunert K. (Eds), *Product and Process Innovation in the Food Industry*, Blackie Academic. & Professional, London, pp 1-37.
- International Food Information Council (IFIC) (2002), *Functional Foods: Attitudinal Research*, available on www.ific.org.
- International Food Information Council (IFIC), *Consumer attitudes toward functional foods/ foods for health*, Opinion Leader briefing 2005 available on www.ific.org;
- International Food Information Council (IFIC), *Consumer attitudes toward functional foods/ foods for health. A trended quantitative survey*, Opinion Leader briefing 2007 available on www.ific.org;
- Mark-Herbert, C., (2003): Development and marketing strategies for functional foods, *AgBioForum*, 6 (1&2), pp. 75-78.
- Schaafsma, G., Kok, F., (2005): Nutritional aspects of food innovations: a focus on functional foods, in Jongen W.M.F, Meulenberg, M., (eds.), *Innovation in agri-food systems. Product quality and consumer acceptance*, Wageningen Academic Publishers, Wageningen, NL.
- Schmidt D.B., (2000), Consumer Response to Functional Foods in the 21st century, *AgBioForum*, 3, pp. 14-19.
- Soldi S., (2007), E' tutto funzionale? Pro e contro di formulazioni accattivanti presenti sul mercato. 2007. Disponibile su <http://www.aita-nazionale.it/atti/071025/soldi.pdf>. Last consultation 3/12/2007.
- Urala, N., Lähteenmäki, L., (2003): Reasons behind consumers' functional food choices, *Nutrition & Food Science*, 33, pp. 148-158.
- Urala, N., Arvola, A., & Lähteenmäki, L. (2003), Strength of health-related claims and their perceived advantage, *International Journal of Food Science and Technology*, 38, pp. 815-826.

Van Trijp, J.C.M., Steenkamp, J.E.B.M., (2005): *Consumer-oriented new product development: principles and practice*, in Jongen W.M.F, Meulenberg, M., (eds.), *Innovation in agri-food systems. Product quality and consumer acceptance*, Wageningen Academic Publishers, Wageningen, NL.

<http://www.eufic.org/page/en/nutrition/functional-foods/>. Last consultation 10/1/2009.

www.igd.com/1145. Last consultation 11/09/2007.

