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Italian Consumer Attitudes Toward Products for Well-being: The Functional Foods Market

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Abstract

The current paper investigates the factors which influence Italian consumers' behaviour towards functional food products and verifies the opportunities for further expansion of these products through a survey with a sample of 340 consumers responsible for family shopping. Findings show that there is a large number of factors that influence consumer purchasing behaviour. The empirical analysis emphasizes that, although Italian consumers are rather confused on the exact meaning of the term functional foods, their high interest on the bond between diet and health can be a potential element for the development of the demand of these food products. The work also provides a segmentation of the sample to verify the existence of homogeneous groups of consumers characterized by a different propensity towards functional foods.

Keywords: Functional foods, Italian consumers, Market segmentation

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Introduction

Consumer interest in the relationship between diet and health has increased substantially in Europe in recent decades. Research has amply shown that the consumer is today more concerned about self-care and personal health and is seemingly demanding more information on how to achieve better health through diet.

Trends in population demographics and socio-economic changes also point to the need for foods with added health benefits. An increase in life expectancy, resulting in an increase in the number of the elderly and the desire for an improved quality of life, as well as increasing costs of health care, has stimulated governments, researchers, health professionals and the food industry to observe how such changes can be managed more effectively. As a result, today foods are not intended only to provide necessary nutrients for humans but also to prevent nutrition-related diseases and improve the physical and mental well-being of consumers (Menrad 2003); (Roberfroid 2002).

Consequently, the development and marketing of a growing spectrum of products such as *nutraceuticals, medifoods* and *vitafoods* is a major trend in today's food industry. However, the term functional food has become the predominant one even though several organizations have attempted to differentiate this emerging food category[1]. The heterogeneity of definitions used internationally to classify functional foods makes it difficult to collect homogenous statistic data on this market (Goldberg 1994); (Sheeby and Morrissey 1998); (Roberfroid 2002); (Gray et al. 2003). Despite the mismatch of information on total turnover and volume of functional foods sold, there emerges a business in rapid growth. According to a Euromonitor survey, Japan is the world's largest market, the US is the second largest while the European market is less developed. The major European markets are the UK, Germany, France and Italy (Bech-Larsen and Scholderer 2007). Despite the economic opportunities, functional foods have not as yet been defined by legislation in Europe and there is broad consensus that there needs to be a regulatory framework in the EU that will protect consumers, promote fair trade and encourage product innovation in the food industry.

Consumer acceptance of the concept of functional foods, and better understanding of its determinants, are widely recognized by the economic literature as key success factors for market orientation, development, and successfully negotiating market opportunities (Gilbert 1997); (Grunert et al.) 2000); (Weststrate et al. 2002).

The competitive environment for functional foods has been reported to suffer from a lack of data and understanding of consumer market segments (Gilbert 1997). Undeniably, despite the vast

[1] Typically, a food marketed as functional contains added, technologically developed ingredients with a specific health benefit (Niva 2007). Although the term ''functional food'' has already been defined several times (Roberfroid 2002), so far there is no single accepted definition for this group of foods.

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interest of the food industry and the alleged prospect of a bright future for functional foods, few empirical studies of European and Italian consumer acceptance based on primary data collection have been reported (Hilliam 1998); (Poulsen 1999); (Niva 2007); (Bech-Larsen et al. 2001); (Makela and Niva 2002); (Verbeke 2005, 2006); (Vassallo et al. 2009).

In this context the main intention of the current paper is to investigate the factors which influence consumer behavior towards functional food products and ascertain the opportunities for further expansion of this segment in order to subsequently develop appropriate consumer communication strategies based on market segmentation. In this study, the term *functional food* is used in accordance with the European Commission's Concerted Action on Functional Food Science in Europe (FuFoSE): *''a food product can only be considered functional if together with the basic nutritional impact it has beneficial effects on one or more functions of the human organism thus either improving the general and physical conditions or/and decreasing the risk of the evolution of diseases"* (ILSI Europe 2002).

Based on the previous considerations the first part of the current work carried out an overview of the development projections and market potential of functional foods at the international, European and national scale. This section is followed by a brief review of the literature on consumer attitudes towards functional foods, useful to identify core issues to be investigated in the empirical part. Subsequently the results of a direct survey are presented providing several indications for developers and marketers as well as government bodies that are interested in designing consumer communication strategies and effective health programs. The final section concludes with a discussion of the implications of the results and suggests some future research avenues.

Economic Opportunities in the Functional Foods Market

The lack of an official definition is one of the main constraints for the analysis and monitoring of functional food markets (Menrad 2003), as well as for their growth (Castellini et al. 2002). Hence whether a broader or a more specific classification is applied a variety of estimations on global and regional market values have been formulated. Nevertheless, academic researchers and professionals agree that the functional foods market is continuously growing worldwide (Menrad 2003; Verbeke 2005; FAO 2007). Some of the most reliable estimates of the functional foods market valued the industry at €7 billion in 2000, considering only markets in the USA, Japan and Europe (Weststrate et al. 2002), while global market estimates vary from $33 billion (Hilliam 1998), to €32 billion (Urala and Lahteenmaki 2004) and up to $47.6 billion (Sloan 2002). Other even brighter estimates report that the global market is currently worth around $60 billion per annum.

Regarded as the birthplace of functional foods and world leader in the development of related technologies, Japan is the largest market in the world and has the highest per capita consumption with around $166 per annum (World Nutraceuticals 2006). The Japanese functional foods market has exhibited a steady average growth rate of 9.6% per year for the past decade, and in 2003 its

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functional food industry was estimated to have a total turnover of around $11.7 billion[2] (Euromonitor 2004).

The United States currently possesses the second largest and most rapidly expanding functional food and nutraceutical market in the world. Estimates of the industry's value, in 2003, range from $10.5 billion (Euromonitor 2004) to $21.3 billion (Datamonitor 2007)[3]. Functional foods have a market share of around 2-3% in the US food market (Menrad 2003) and it is constantly increasing. This growth can be explained by the legislative framework which continues to be more favorable than in Europe (Hilliam 1999) and (Side 2006).

Other important markets for functional foods include Canada, India, China, Brazil and Europe. The Canadian functional foods industry totaled C$2.9 billion in revenues for 2004 (Statistics Canada 2007). In India the most common forms of functional foods and nutraceuticals are available as traditional Indian Ayurvedic medicines[4], which are marketed under different brand names (Patwardhan et al. 2005), making it quite difficult to set an exact value on the market: according to some researchers India's national industry is worth $10 billion per annum, with exports of $1.1 billion making a significant contribution to the export market (Singh et al. 2003). Functional foods and nutraceuticals are also part of the traditional Chinese diet and are a large component in traditional Chinese medicine, with the functional foods market estimated at $6 billion per year (FAO 2007). In Brazil, the sector is relatively young but growing rapidly: sales are projected to reach $1.9 billion by 2009 (FAO 2007). The functional food market in the European Union has grown in recent years from about $1.8 billion in 1999 (Kleter et al. 2001) to between $4 and $8 billion[5] in 2003, depending which foods are regarded as functional (Menrad 2003); (Datamonitor 2007). According to results from these studies, European consumers are generally far more critical of new products and technologies (e.g. GMO food, irradiated food) compared to American consumers (Bech-Larsen and Grunert 2003); (Lusk et al. 2004); (Lusk and Rozan 2005). Bredahl (2001) showed that across European countries, the attitude towards genetic modification in food production was deeply embedded in more general attitudes held by the consumers, in particular towards nature and towards technology. Particularly Italian consumers turned out to be significantly less negative towards genetic modification in foods than Danish and German consumers. In contrast, Canavari and Nayga (2009) suggest that the majority of Italians are not willing to buy GM food products even if they are nutritionally enhanced.

Europeans are not only suspicious of the safety of novel foods, but are also critical of the whole process through which food production becomes increasingly anonymous and distanced from everyday life (Poppe and Kjaernes 2003). Therefore, European acceptance of functional foods would appear less unconditional, better thought-out, and with more concerns and reservations as compared to US consumers[6]. Furthermore, demand for functional foods inside the EU varies

[2] Other estimates valued the Japanese market at 5 billion US$ in 2003 (Side, 2006) and total turnover at around $14 billion USD in 1999 (Hilliam, 2000).
[3] By contrast, Hufnagel (2000) estimated the market value in 1999 at around US$15.5 billion and the Nutrition Business Journal $31 billion in 2006.
[4] Ayurveda is a system of traditional medicine native to India, and practised in other parts of the world as a form of alternative medicine.
[5] Other recent studies estimate this value at around $15 billion in 2006 (Kotilainen et al. 2006) and €9 billion in 2009 (Nomisma 2008).
[6] This may also originate from the recent sequence of food safety scares (Verbeke 2005).

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considerably from country to country mainly due to food traditions and cultural heritage (Castellini et al. 2002) and in general the interest of consumers in functional food in central and northern member states is higher than in Mediterranean countries (Van Trijp 2007). According to the 2004 Euromonitor, the biggest European markets are United Kingdom ($2.6 billion), Germany ($2.4 billion), France ($1.4 billion) and Italy ($1.2 billion). However, many other European markets are experiencing high growth rates, such as the Netherlands (Makinen-Aakula 2006) and Spain (Monar 2007). In addition, Euromonitor forecasted that sales of functional foods will rise moderately from 2005 to 2009 in the newly emerging markets of Hungary, Poland and Russia (Benkouider 2004).

In Italy the demand for functional foods is constantly increasing due to mounting scientific validation of their effectiveness, its aging population and changing lifestyles. In addition, Italians over the past 40 years have robustly reduced daily calories (from 2600 kcal to 2200 kcal per day, in particular reducing fatty foods, animal protein and wine – Italian Ministry of Health, 2007) and are paying rising attention to foods that can combine nutrition and health. Industry reports show that over 4000 products have been reformulated by reducing or eliminating saturated fats, cholesterol, salt, fatty acids to fulfill the demands of national consumers and functional foods now account for around 17% of food sales in the country (Censis 2007). Several nationwide surveys also show that Italian families, especially those with children, seek quality and healthiness of food products ahead of price (Nielsen 2007) in contrast with the general decrease in food purchases, and highlight that at the end of 2007 30% of families claimed to consume functional foods (ISMEA 2007); (Nomisma 2008). Moreover, functional foods are experiencing wide-ranging success thanks to the recent introduction of new EU laws that have improved Italian consumer confidence in labels and advertising information related to the nutritional and health virtues of food products. However, the escalating demand for health-related foods is stimulating companies and farmers associations to offer new products. Effectively demonstrated by the decision of Barilla, the biggest Italian food brand, to launch at the end of 2007 Alixir[7] a new line of food products entirely dedicated to welfare and health. The offer includes ten products, divided in four categories, that (allegedly) help the cardiovascular system, the immune system, the intestinal functions and slow cellular aging.

Currently, on the Italian market, the only noteworthy functional foods, in terms of value, are yogurts, dairy products, beverages and energy drinks[8]. As a result, the Italian market, with plenty of underdeveloped functional food categories, offers interesting growth opportunities for food businesses involved in supplying products with enhanced nutritional and healthy compounds. At present, the market, as elsewhere worldwide, is dominated by large multinationals that are able to afford to pay for R&D and marketing efforts required for success in this area (Menrad 2003); (Thompson and Moughan 2008), though there is an increasing number of small Italian companies focusing on a specific product or health need that are starting to achieve notable results.

[7] No official market data on this product line is currently available. Noteworthy to remark is that on September 2008 the Antitrust Authority has imposed a fine of € 200,000 to Barilla for incorrect commercial practices, considering misleading Alixir's commercials, forcing the company to review its packaging and remove many recommendations.
[8] An interesting case in Italy is represented by "Selenella", potatoes rich in selenium. The Consortium Selenella, owner of the registered trademark, in 2008 had 23.5 million euros in revenues and a volume of about 30 thousand tons. The product is particularly appreciated also on foreign markets, particularly in countries of Northern Europe.

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Consumer Attitudes Towards Functional Food: A Review

Despite the general socio-demographic and behavioral trends which are in favor of functional foods there are specific challenges in marketing such products (Menrad 2003). For successful functional food expansion, as broadly recognized in the literature, consumer acceptance of the concept of functional foods, and a better understanding of its determinants, are key success factors for market orientation, development and successfully negotiating market opportunities (Gilbert 1997); (Grunert et al. 2000); (Weststrate et al. 2002). Accordingly, in recent years several papers have reported empirical studies of consumer acceptance based on primary data collection, especially in the United States (Childs and Poryzees 1997); (Gilbert 1997,2000); (IFIC 2007) and the European Union (Bech-Larsen et al. 2001); (Makela and Niva 2002); (Van Kleef et al. 2002, 2005); (Verbeke 2005 and 2006); (Urala and Lahteenmaki 2006, 2007); (Nielsen, 2007), providing insight into the profile of functional food consumers.

A common result emerging from the literature is that functional foods from the consumer's standpoint are not perceived as being one homogeneous group (Urala and Lahteenmaki 2003). It has thus been concluded (DeJong et al. 2003) that the characteristics of functional food users cannot be legitimately generalized, given the clear differences between the consumers of different functional food products. Most of such studies have demonstrated that cognitive, motivational and attitudinal determinants of consumer acceptance of functional foods vary considerably in different countries. In particular, the European market[9] is characterized by high demand heterogeneity linked to the existence of marked regional differences in the perception and willingness to use functional foods. Such heterogeneity stems mainly from socio-demographic differences, the existence of dissimilar dietary habits, the different national policies for the promotion of public health, but also differences related to cultural traditions (Castellini et al. 2002).

Considering consumer demographic characteristics, for example, the literature shows that female consumers are a more promising target group for functional foods than men (Urala 2005), partly because they show more interest in health in general (Childs and Poryzees 1997); (Bogue and Ryan 2000). Moreover, functional food users are often more educated (Anttolainen et al. 2001); (DeJong et al. 2003). Concerning age, Poulsen (1999) mentions that older participants in his research (i.e. >55 years) showed a greater intention to buy functional foods. This contrasts with previous results by Childs and Poryzees (1997) according to which the elderly were less intent on buying a food that prevents a disease compared to younger consumers. This trend seems to be confirmed in the Italian market where the "old generation", is more oriented towards so-called mature products, while young people prefer healthy foods (Ismea 2007). Furthermore, Verbeke (2005) mentions that consumer attitudes towards functional foods do not depend on their socio-demographic characteristics. These contradictory findings suggest that profiling functional food consumers should not be generalized demographically.

Some elicit evidence showing the main factors influencing purchasing behavior, related to functional foods, can be distinguished in lifestyle variables, health consciousness and attitudes

[9] Some studies show, for example, that in central and northern Europe, the interest of consumers towards functional foods is higher than in Mediterranean countries, where, undoubtedly, there is less familiarity with them (Menrad 2003); (Van Trijp 2007).

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towards healthier products (Cox et al. 2004); (Urala and Lahteenmaki 2004) and variables closely related to the product's extrinsic and intrinsic attributes (Jonas and Beckmann1998); (Urala 2005); (Verbeke 2006).

With reference to lifestyle variables an important factor for the consumption of functional foods is the preservation of good health status (Urala 2005) and to what extent consumers perceive functional foods contribute to this aim. European consumers consider food healthiness to be an important factor affecting their overall nutrition choices (Lappalainen et al. 1998). However, also in this case, there is a considerable body of research that shows there are consistent individual differences in health behavior (Armitage and Conner 2000); (Gilbert 2000). The research by van Kleef, van Trijp and Luning (2005) proves that the relation between the health condition of a consumer and the type of product's health claim affects the intention to buy the product. Also, Frewer, Scholderer and Lambert (2003) emphasize that consumer risk perceptions may have an important role in the acceptance of functional foods. Verbeke (2005) found that believing in the health effects of functional foods is the most crucial factor affecting consumer acceptance and Cox et al. (2004) found that the perceived efficacy accounted well for the intention to consume functional foods that were said to improve memory. Another important factor is the presence of specific health problems: according to Verbeke (2005) the existence of a family member with a particular health difficulty positively affects the acceptance of functional foods.

With reference to product attributes, those relevant to purchasing behavior are as follows: knowledge and familiarity with functional ingredients (Herrmann and Roeder 1998); (Rams 2002), as well as food safety (Bech-Larsen et al. 2001); (Verschuren 2002), convenience (Poulsen 1999); (Rams 2002); (Verschuren 2002); (Pettinger et al. 2004) and type of base product (Poulsen 1999); (Rams 2002). Furthermore, organoleptic attributes, especially taste, are some of the most important factors that affect consumers' choice of functional foods (Jonas and Beckmann 1998); (Urala 2005); (Verbeke 2006) as well as the perception that functional foods could be less natural than conventional foods (Frewer et al. 2003); (Cox et al. 2004). Urala (2005) supports the view that trust in functional foods is affected by the type of base product (carrier) whose attributes have been improved. Bech-Larsen and Grunert (2003) agree that the type of base product contributes to how much consumers perceive functional foods to be healthy. Van Kleef et al. (2005) add that potential buyers tend to trust health claims more when the basic carrier has a positive overall image, as well as a history in health claims (e.g. yogurt, juices, etc.). Moreover, it is much easier to gain consumer acceptance for a product enriched with more familiar ingredients, such as vitamin C, calcium, Omega-3, than it is for unfamiliar ones, such as selenium (Menrad 2003); (Bech-Larsen and Scholderer 2007). Furthermore, another important issue is how to communicate the health effects of functional foods reliably to consumers (Poulsen 1999) as marketing campaigns might not necessarily be trusted. The role of information is crucial because consumers cannot perceive the benefit directly from the product, unlike for instance taste and other sensory characteristics.

The type of information and the trust in it regarding the effect of a particular product on health constitute additional factors of functional foods' success (Urala 2005). According to Tuorila and Cardello (2002), information concerning the health benefits of a food can increase the likelihood of its consumption. However, due to limited consumer knowledge and awareness of the health effects of newly developed functional ingredients, there are strong needs for communication activities (Wansink et al. 2005; (Biacs 2007); (Salminen 2007).

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Analyzing the Italian market, few papers have reported empirical studies of consumer acceptance based on primary data collection. An interesting study (Vassallo et al. 2009) shows that Italian consumers perceive functional products as healthier but less pleasing than conventional, and tend to show little willingness to accept the derivatives of functional cereals. In addition, consumers tend to be influenced more by the health message concerning the reduction in disease risk in assessing the wholesomeness of foods.

Italian Consumer Attitudes toward Functional Foods: An Empirical Analysis

Objectives and Procedures

The main purposes of this paper are to investigate the factors which influence consumer behavior towards functional food products and verify the existence of market segments formed by consumers with similar preferences, in order to subsequently suggest and develop appropriate consumer communication strategies based on market segmentation. From the available studies, socio-demographic characteristics, cognitive and attitudinal factors emerged as potential determinants of consumer acceptance of functional foods.

Based on the evidence found in the literature, we hypothesize that consumer attitudes toward functional foods are affected by several factors, including knowledge, consumer trust in health claims as well as trust in regulatory bodies. We thus seek to explore general consumer attitudes about food, nutrition and health; consumer awareness and interest in functional foods; motivation to buy this type of food or to reject it respectively; knowledge and beliefs about specific food benefits. In addition, our analysis pays particular attention to the various ways in which information about functional foods is conveyed to consumers, trying to identify possible strategies to improve its effectiveness. This latter aspect is noteworthy considering that in recent times, in Italy, there has been growing interest in adopting an identification label for "health foods", to help consumers recognize them and clearly distinguish their benefits[10].

For this purpose, a quantitative survey was conducted to explore Italian consumers' knowledge and attitudes toward functional foods. A questionnaire was developed to conduct data and administered to a sample of consumers, living in the three cities of Bologna, Rome and Naples, respectively located in the north, center and south of Italy[11].

To determine the sample a two stage procedure was adopted. Firstly a simple sampling technique was used; setting 0.95 as the level of confidence, for an infinity population, 340 personal interviews were carried out fixing the sample error at 5.3%. Subsequently, interviews were conducted using two criteria: the city of residence and place of purchase. Face-to-face interviews (125 in the north, 100 in the center and 115 in the south) were conducted from July to September 2008 at different outlets (supermarket, discount, traditional store) so as to include the different consumer types in the sample. The number of questionnaires administered among modern

[10] The National Consumers Union has proposed to adopt a brand that identifies "health food" to help consumers distinguish and recognize the benefits provided. The brand should be under the close supervision of the Antitrust authority, to ensure the accuracy of the claims used and the completeness of the information, including contraindications written on food packaging.

[11] Rome is the largest Italian city in terms of population (approximately 2.726.593), and Naples the third largest (1.226.594), while Bologna has 374.057 inhabitants (ISTAT 2007).

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distribution chain outlets reflects the national share of food sales (ISMEA 2007); (Federdistribuzione 2007). Hence around 50% of the interviews were conducted in supermarkets; 20% in hypermarkets; 10% in discount stores and 8% in traditional stores. All respondents were responsible for food purchasing within their household. This choice is reflected in the gender distribution with approximately 35% male and 65% female[12]. Although this sample is not strictly statistically representative, it includes respondents with a wide variety of socio-demographic backgrounds (Table 1). More specifically, the sample is biased towards age[13]. However, the distribution of education and marital status closely matches that in the Italian population. Moreover, whether this bias has an impact on the general findings is rather questionable since the literature includes studies that report differing associations between age and functional food acceptance or use. For example, Poulsen (1999) mentions that relatively older participants in his research (i.e. older than 55 years) showed a greater intention to buy functional foods. Urala (2005) also maintains that elderly consumers put more emphasis on the results of food consumption relevant to the prevention of a disease compared to younger consumers. On the contrary, Childs and Poryzees (1997) found that the elderly show less intention to buy a food that prevents disease compared to younger consumers.

The questionnaire used during the survey consists of 34 questions, mostly multiple-choice, divided into five sections that examine, respectively: consumer knowledge of the link between food choices and health issues; purchasing habits and consumption of interviewees; perception and willingness to purchase functional foods; their views about the current level of available information, their socio-demographic characteristics and lifestyles. The collected data were analyzed in two phases. The first, purely descriptive, is an overview of the frequency of responses, based on the construction of contingency tables, through which there were early indications on the degree of association between two or more characters. Recognizing that knowledge of the distribution of consumer preferences forms the basis for product differentiation and market segmentation (Green et al. 2001), the second phase of analysis provides a market segmentation identifying different profiles of consumers, through the use of PCA and Cluster Analysis. PCA enables simultaneous analysis of the complex information provided by a large number of variables and turns the initial variable into a reduced number of artificial variables or factors explaining a high percentage of the information included in the original variables. After extracting the main components the statistical units can be aggregated through the CA aimed at classifying the statistical units identified in a set of "exclusive and exhaustive" clusters so as to maximize the internally homogeneous nature and the externally heterogeneous nature.

[12] The literature shows that female consumers are a more promising target group for functional foods than men (Urala 2005), partly because they show more interest in healthy food consumption and health in general (Bogue and Ryan 2000); (Childs and Poryzees 1997).

[13] Respondents aged between 26-45 were over-represented with respect to population demographics. This effect is partly due to the decision to include in the sample only individuals responsible for household food shopping (excluding from the survey consumers under 18 years old and over 75) and also due to the fact that we sought to include consumers sensitive to healthy products (who, judging from latest available data from the ISMEA (2007) survey on Italian food consumption, are mainly young, married with children and have a medium/high annual income). This may be a problem for the evaluation of the cluster size in the population since it probably overestimates the size of the clusters, grouping the most interested respondents. However, this paper does not aim to estimate segment sizes or market shares for particular product profiles.

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Main Results from Explorative Analysis

Socio-demographic analysis of the interviewees displays the predominant presence of women (66.6%) aged between 35-45 years (35.5%) and 25-35 (27.7%), married with children under 10 years (36.4%), with an average level of education: most of them hold a high school degree (58.8%), but the sample also includes university graduates (27.2%). In terms of occupation, the sample mainly comprised housewives and employees.

Table 1. Demographics

		Sample	Population*
	male	33.4	48
Gender	female	66.6	52
	18-25	9.8	8.5
	26-35	27.7	17
Age	36-45	35.5	19.8
	46-55	18.2	17.8
	56-65	5.9	16.2
	66-75	2.7	9.6
	single	24.6	27.8
	married with children under 10 year	36.4	
Marital status	married	28.6	62.5**
	Separated/divorced	8.1	6.2
	widow(er)	2.4	3.5
	Master degree	6.6	
	Bachelors degree	27.2	31.9***
Education	High school diploma	58.8	57***
	Middle school diploma	5.9	*n.a.*
	other	1.5	*n.a.*
	employee	31	*n.a.*
	self-employed	12.2	*n.a.*
	doctor/paramedic	3.9	*n.a.*
Profession	housewife	18.5	*n.a.*
	retired	4.8	*n.a.*
	student	12.5	*n.a.*
	trader	4.5	*n.a.*
	unemployed	3.9	*n.a.*
	other	8.7	*n.a.*

* Istat (National Statistics Institute) data, 2007
** Italian total married population
*** Eurostat and OCSE data 2009, referred to the 2007 population between 25 - 64 years old.

With reference to the level of healthy eating habits and lifestyle of the sample (ascertained by a set of specific questions) it appears that in most cases (36.4%) the former can be considered intermediate healthy, while with regard to lifestyle healthy habits are predominant (40.7%). Importantly, there is also a significant incidence of unhealthy habits (26.6%) linked to the fact that many of the interviewees have a sedentary lifestyle[14].

[14] For the evaluation of dietary habits we asked interviewees to indicate the frequency with which they consume fruits and vegetables, legumes and cereals, fried foods, carbonated drinks, snack between meals, high-fat products, white meat and organic products. To evaluate the lifestyle of the interviewees we asked how often they watched TV, did physical exercise, had check-ups, if they consulted a nutritionist, or attended health centres, if they had a job that forced them to stay seated for a long time. The replies were analysed and summarised on a scale of health ranging from 1 = not at all healthy to 5 = very healthy.

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However, respondents appear satisfied with their diet, 40% stating they are mildly satisfied with their choices and consider them quite healthy. Food consumption style was further analyzed by verifying the existence of any specific needs that may affect purchasing decisions and that potentially lead to a greater propensity towards functional foods. About 51% of respondents claim to be influenced in their food choices by specific requirements related primarily to specific medical disorders (22% overweight, allergies/intolerances 8%, heart problems 8%, diabetes 5%) but also by ethical considerations (vegetarian diet 3%) and sports (5%).

Regarding the awareness of the link between food style and health issues, the results clearly show that respondents are quite aware of the fundamental role played by their food choices in determining their health status (52% of the sample strongly agree with this statement) and the availability of specific products that have significant health properties. Moreover, they show complete disagreement (in 27.7% of cases) with the statement that they can monitor their health independently of their food choices, but do not always state their willingness to give up the foods they like to improve their health status. Hence, even though respondents are aware of the close relationship between diet and health, their choices lead towards the pleasure of consumption rather than wellbeing[15]. This trend is confirmed by the analysis of the variables related to shopping habits, validating that the respondents tend to be influenced in their food choices mainly by taste, pointed out in the majority of cases (59%) as the most important attribute. Significant sensitivity is attributed also to the nutritional aspects, selected in 36% of cases as quite important, while price and brand are perceived on average as important attributes, respectively in 44.5% and 45.7% of cases. The least important attributes are the indication of origin (18.2%) and the presence of quality certification (12.4%).

Consumer attention to nutrition is also confirmed by the interest shown by respondents in the nutrition information on labels. 28.5% of interviewees state to read always nutritional information on the label; while 35% claims to read it on a regular basis, particularly in relation to specific products. Differently 18% declares to read it only on the first purchase and 10,5% only occasionally, whereas just 8% never reads it. Taking into account consumers' propensity towards functional foods, our research tested the level of knowledge of such products displayed by the respondents and their purchase frequency. Analysis of the data shows that consumers are not well informed on the concept of functional foods. As regards the level of knowledge, only 8% of interviewees stated they had never heard of this new type of food product, while 31% stated they knew it quite well (Graph1).

However, this data is not confirmed by the definitions of functional foods given by respondents. Undoubtedly, the term *functional foods* is still not very common in everyday language, and in many cases (Graph 2), generates confusion with the "light" and diet products (20%), or functional food is incorrectly associated with food for those who have health problems (16%). In many cases respondents are unable to give a definition (24%). This finding confirms the results from other studies developed in various European countries that consumers often do not know the term *functional food* or similar phrasing, but show a rather good agreement with the concept[16]. The lack of familiarity with the concept of functional foods becomes more evident on

[15] This phenomenon is known as ''optimistic bias'' in the health behaviour literature, that is, people's general tendency to see only others at risk from lifestyle diseases, but not themselves (Frewer et al. 2003).
[16] In the United Kingdom, France and Germany, up to 75% of the consumers have not heard about the term ''functional food'', but more than 50% of them agree to fortify functional ingredients in specific food products

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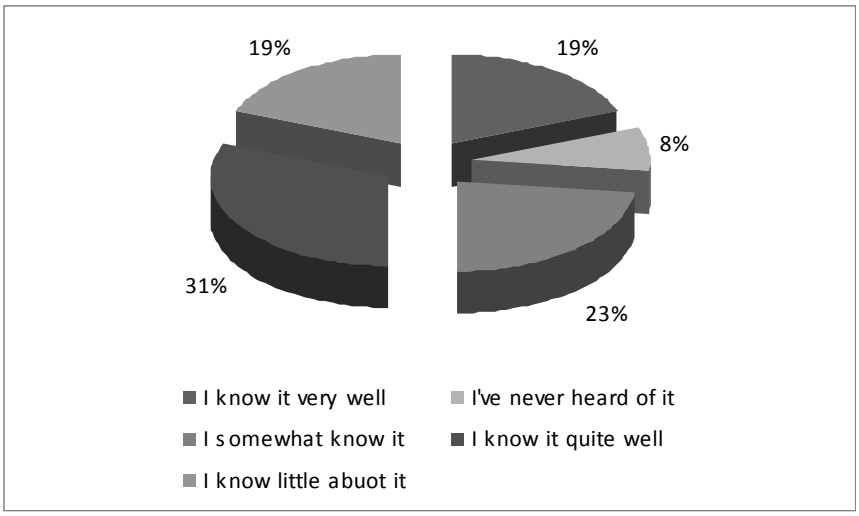
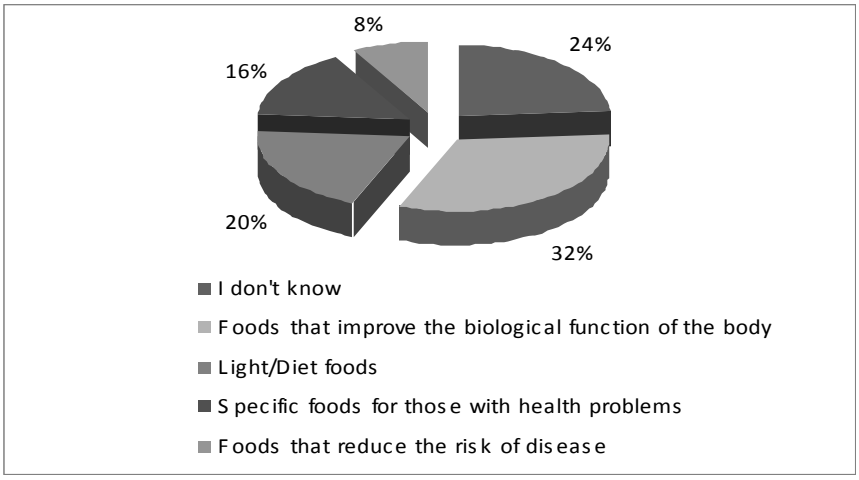
considering that most consumers (44%) were unable to provide an example of functional foods or gave incorrect examples (26%), while the proportion of those who indicated one or two examples (24%) was lower, and the lowest share was of those who indicated more than two (6%).



Graph 1. Knowledge of Functional Food



Graph 2. Definition of Functional Foods

With respect to the frequency of consumption (Graph 3), 30% of respondents stated that they had never consumed these products, mainly because they do not know their properties (32%) but also because they are doubtful about their potential benefits (17%), or consider these products only suitable for the sick (15%) or simply because they are not interested in this kind of product

(Hilliam, 1998; 1999). Another study found that while in Belgium 49% of the consumers is familiar with the term of functional food, this ratio in Poland is only 4% (Krygier & Florowska, 2007). In Hungary the expression of ''functional'' proved to be unknown for about 70% of the respondents, according to a market survey at the University of Kaposvar, Hungary (Szakal et al., 2004).

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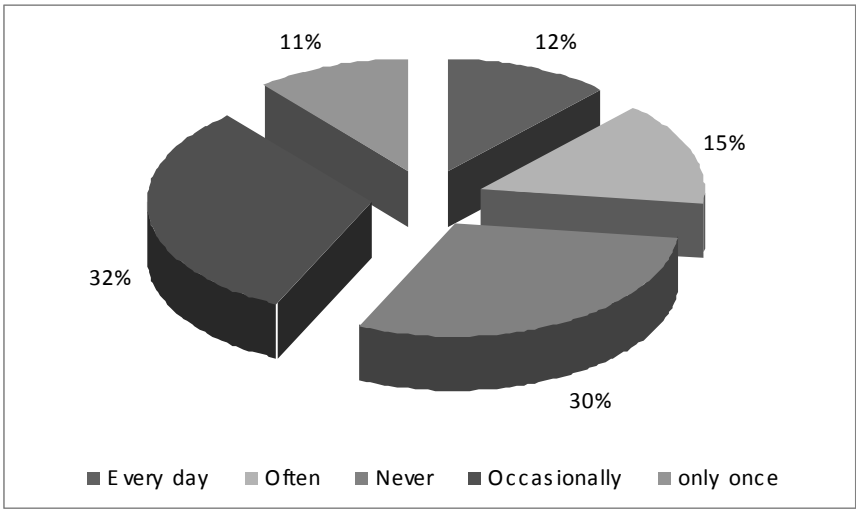
(15%). In order to highlight the characteristics of this segment of consumers, a cross analysis was made with the social demographic variables and the variables related to food habits and lifestyle (Table 2). The analysis shows that there is no significant relationship between consumption frequency and the socio-demographic variables although there is a significant relationship with respect to dietary habits and lifestyle (Table 2). In particular, this group is characterized by the highest concentration of individuals with eating habits not at all healthy (around 10%) or slightly healthy (34%), who have no food habit related to specific health problem (61%) and a fairly unhealthy lifestyle (41.9%).



Graph 3. Consumption frequency

Table 2. Main differences between consumers and non consumers

		Consumers	Non Consumers	Sig.
Specific health problem	None	40.3	61	.002
	Heart problems	6.1	3.9	
	Allergies/Intolerances	8.3	6.7	
	Overweight/obesity	26.5	20.9	
	Diabetes	7.8	2.5	
	Gastrointestinal disorders	4.3	2	
	Other	6.7	3	
Eating habits	Very unhealthy	2.6	9.8	.000
	Fairly unhealthy	12.5	34.3	
	Somewhat Healthy	36.9	32.2	
	Fairly healthy	29.1	20	
	Very healthy	18.9	3.7	
Lifestyle	Very unhealthy	1	5.7	.000
	Fairly unhealthy	19.6	41,9	
	Somewhat Healthy	53.9	43,8	
	Fairly healthy	22.2	7,6	
	Very healthy	3.5	1	

Deleting this segment of consumers from the sample, the survey focused on those who said they consumed functional foods, albeit with different levels of frequency. Among these prevail occasional consumers (32%), followed by those with a higher consumption frequency (15%) and

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those reporting daily consumption of such products (12%). The lowest absolute incidence is of those who say they have tested functional foods only once (11%). In 83% of cases consumers bought these products at modern distribution chain outlets (such as supermarkets and hypermarkets), the most widely consumed products are probiotic yogurts (29%), vitamin-enriched/omega-3s milk (21%) and enriched breakfast cereal (15%) followed by ready to drink products (11.5%), vitamin fruit juice (10%) and fortified biscuits (6%). Among the least consumed are low-cholesterol butter / margarine (5.3%) and energy drinks (2.2%).

The main reasons that lead consumers to purchase such products are to improve their personal well-being and that of their family members (23%), the need to reinforce their immune system (18%), and the need to improve their gastrointestinal functions (15%). However, there are also those who consume functional products just out of curiosity (14%) or without a specific reason (6%).

On analyzing the variables that affect the perception of functional foods it is quite apparent that the sample interviewed considers such products useful for improving their health status (42%) even if they state that they are not always able to fully understand the effects of such products (29.6%). Nevertheless, it should be noted that 15% of respondents strongly agree with the statement that these products are intended only for those who have health problems, while 11% believe that they can lead to side effects and 9% consider them simply a passing fad. These data highlight once again great respondents' confusion on functional foods.

Table 3 shows that consumers do not perceive these products less tasty than conventional; nevertheless in the preponderance of cases (53%) they point to their higher costs and consider the current available variety limited. Consequently high cost, difficult availability and limited range can be considered the main obstacles to the purchase of these products.

Table 3. Perception of Functional Foods

Degree of agreement	Not at all	A little	Middling	Quite strong	Strong
I fear that these foods may have side effects	16	40.2	17.7	14.6	11.5
These products are simply a passing fad	19	45.1	16.4	10.2	9.3
They are intended only for those who have health problems	10.2	32.2	27	15.6	15
I do not believe their property	22.6	55.3	13.7	3.1	5.3
I do not understand their effects or their consumption	8	16.1	25.4	20.8	29.6
Consuming these foods improves my state of health	0.9	12.8	19	25.2	42
They are less tasty	35.8	41.5	12.8	4.4	5.3
They are more expensive	5.3	11	12	18.2	53.5
It is not easy to find these products	11.5	36.2	26.2	11.1	15
The range on the market is limited	8.9	34	19	12	27
It's difficult to distinguish functional from conventional foods	10.2	26.1	25	15.5	23.4
The information on the label is difficult to understand	7.5	29.6	20.3	13.7	28.7

Moreover, respondents say that there are some difficulties in distinguishing functional from traditional products, denoting the complexity of the information contained in the label. Consistent with findings from other studies, the existence of a smooth flow of information between businesses and consumers, allowing proper assessment of the benefits that may result from the consumption of functional foods, plays a central role in determining the greater or lesser success of these products (Wansink et al. 2005); (Biacs 2007); (Salminen 2007).

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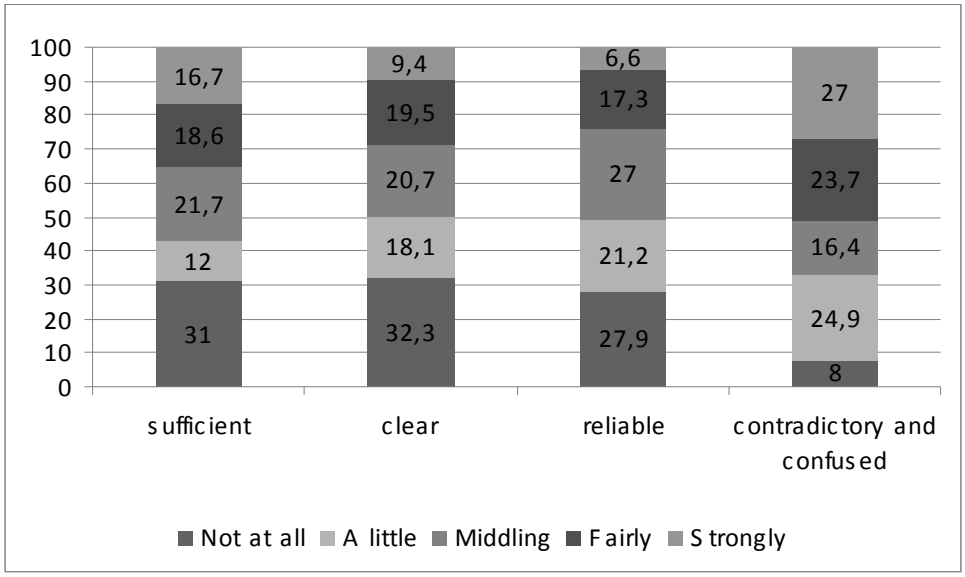
Following the above arguments, the last part of the survey analyses the different ways in which information on functional foods is conveyed to consumers, trying to identify possible strategies to improve their effectiveness. Specifically, we tested the opinions expressed by respondents regarding the adequacy, clarity and reliability of the information, the degree of importance and trust attributed to the different sources of information and, finally, possible ways of improving such information flows.

From the analysis of the results summarized in Graph 4, it is clear that consumers express a negative opinion towards the current level of information available, since in more than 30% of cases information is considered inadequate and not simple to understand, as well as contradictory and confused, showing also some skepticism about their reliability.



Graph 4. Consumer opinions on current available level of inform

The results also show that the main sources from which consumers obtain information are from advertising (32%) and product labels (27%), followed by doctors / nutritionists (15%) and television programs (8 %). The Internet (6%), word of mouth (6%) and the specialized press (5%) are ranked at the bottom, while only 1% of the information is acquired through public information campaigns. The sources in which respondents have most confidence are doctors and public bodies, trusted amply by, respectively, 63% and 49% of consumers, while a lesser degree of confidence is given to producers and labels, which 42% and 46%, respectively, state they do not know whether or not to trust. As the respondents place greater inherent trust in the sources from which they receive least information, this would indicate such sources need to be strengthened.

Finally, we asked interviewees to express their opinion on the need to improve the current level of information and also indicate possible ways to do so by giving them several options. Almost all of the consumers would like more information (only 5.4% stated otherwise), considering it necessary to implement information campaigns and public education (23%) and improve

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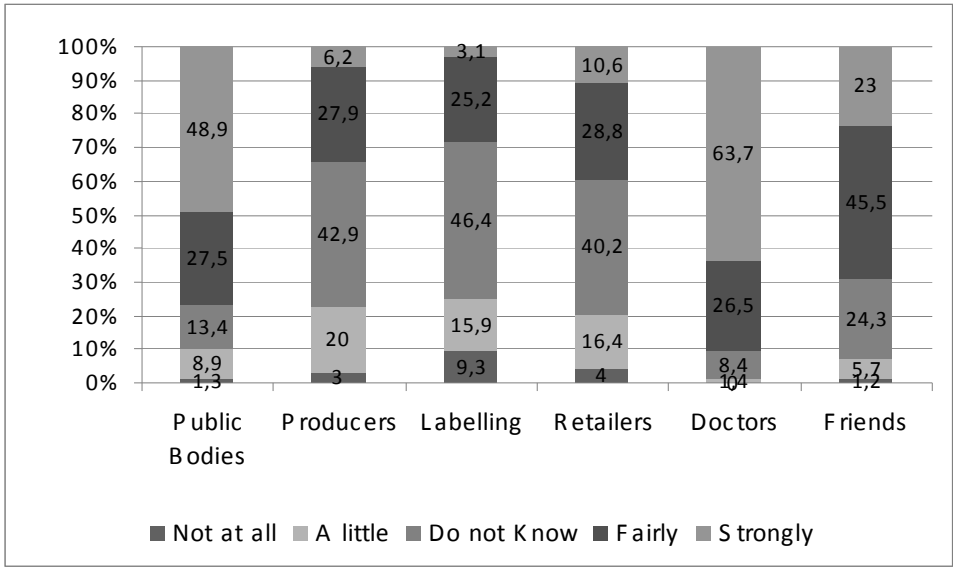
descriptions on nutritional labels (25.5%), but also introduce a logo or symbol that might draw attention to the health benefits of the product (22.2%).



Graph 5. Consumers' confidence in different sources of information

Segmentation Analysis

Traditionally the segmentation of the sample entails the breakdown of the statistical units identified based on socio-demographic features. However, to develop a profile of consumers based on their higher or lower propensity to functional foods, our analysis showed that there are many different variables that seem to be correlated and play key roles in influencing consumer behavior.

Through principal components analysis, we sought to verify the existence of latent factors that summarize consumer attitudes towards functional foods in a smaller set of underlying dimensions which explain the inter-relations amongst an original, large set of metric variables. The choice of the variables to submit to factorial reduction was made on the basis of the analysis of the correlations existing amongst the original variables, verified using Bartlett's test for sphericity while the choice of the factors was made on the basis of the eigenvalue criterion, as well as considering of the cumulated variance explained by the factors taken together. Analysis of principal components (varimax rotation method) reveals the existence of four factors which together explain 72% of the original variance. Table 4 presents the matrix of rotated components from which it emerges that the first factor summarizes up five variables related to the degree of adequacy, clarity and reliability of information available to consumers on functional foods and about the labels of these products. Thus we can consider the first factor as information.

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Table 4. Matrix of rotated component

Variables	Factors				com[17]
	1	2	3	4	
Degree of importance attributed to quality label	-.288	-.239	.158	.229	.740
Degree of importance attributed to brand	-.134	-.038	**.835**	.132	.590
Degree of importance attributed to indication of origin	-.134	-.045	**.777**	.154	.696
Degree of importance attributed to price	-.143	.044	**.772**	.059	.665
Degree of importance attributed to taste	.584	.113	**.893**	.063	.767
Degree of importance attributed to nutritional attributes	.598	.231	**. 653**	.038	.757
I'm cautious about the consumption of these products	.484	**.866**	-.069	.162	.625
These products are simply a passing fad	.501	**.751**	-.014	.055	.637
They are intended only for those who have health problems	.034	**.783**	-.140	.295	.686
I do not believe their property	-.259	**.791**	-.080	.112	.652
I do not understand their effects or their consumption	.479	.239	-.054	.349	.711
Consuming these foods improves my state of health	.304	**-.743**	-.108	.018	.709
It is not easy to find these products	.562	**.807**	.021	.263	.643
The range on the market is limited	.431	**.837**	.081	-.003	.790
It's difficult to distinguish functional from conventional foods	.532	**.704**	-.130	.255	.810
The information in the label is difficult to understand	**.825**	**.633**	-.131	.295	.851
The information about functional foods is sufficient	**-.774**	.173	-.143	.299	.854
The information about functional foods is clear and simple	**-.784**	-.099	.139	-.172	.832
The information about functional foods is truthful	**-.788**	-.096	.006	-.193	.534
The information about functional foods is confused	**.847**	-.111	.004	.202	.722
My food choices affect my health	.203	.235	-.102	**.651**	.697
I have control of my health no matter what I eat	.018	.333	.069	**.728**	.668
I don't want to give up the foods that I like	.042	-.104	.067	**.509**	.526
I do not need to worry what I eat	.062	-.066	.432	**-.748**	.762
Degree of healthiness in food choice	-.111	-.065	.389	**.842**	.645
Degree of healthiness in lifestyle	-.152	.333	.209	**.826**	.646
Eigenvalue	5.574	2.579	2.059	1.716	
Variance %	23.33	19.11	15.9	13.5	
Total variance %	23.3	42.41	58.3	**71.81**	

Extraction method: principal component analysis. Rotation Method: Varimax with Kaiser normalization.

The second factor, however, summarizes a number of variables related to the opinion that consumers have of functional foods, in terms of availability in food stores, range extent and also their beliefs on products' properties and potential health benefits. Therefore this factor expresses the *opinion* that consumers have of functional foods.

On analyzing the third column of the matrix of rotated components it is possible to describe the third factor as *shopping habits*, which summarizes several variables that indicate the degree of importance attributed by respondents to various attributes in their food choices. Finally, the fourth factor summarizes a number of variables used to measure the health consciousness of respondents and their awareness about the links between diet and health, and may thus be called *health in food choices*.

Based on these four factors, a segmentation of the sample was created to verify the existence of homogeneous groups of consumers with a different propensity towards functional foods. For this

[17] Extraction communalities are estimates of the variance in each variable accounted for by the factors (or components) in the factor solution.

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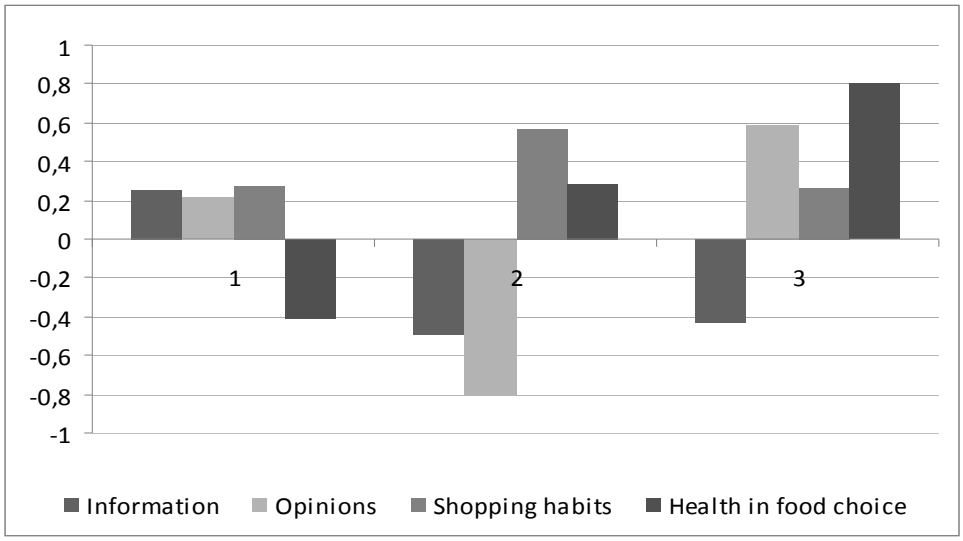
purpose a cluster analysis was applied, using the K-means method, which is a non-hierarchical algorithm, widely used in literature for analogous studies (Poulsen 1999); (Ares and Gambaro 2007), (Cox et al. 2008); (Herath et al. 2008); (Hailu et al. 2009); (Foutopoulos et al. 2008); (Wadolowska et al. 2008).

The non-hierarchical k-means algorithm splits the sample into a predefined number of clusters to maximize, using grouping variables, the ratio between external variance (between groups) and internal variance (in groups). There are no specific rules or statistical methods for choosing the number of clusters (Bretton-Clark 1993), and, as in many other cases, the trade-off between clarity and precision is partly what determines the choice. From the application of this method it results that the division into three groups was the ideal solution where homogeneity is maximized within the individual clusters and minimized between them; any further group would have determined an excessive fragmentation of the sample.



Graph 6. Final cluster centers

The results reported in table 5 elicit that highly significant differences were found in the scores of the four factors between the clusters, suggesting that the three identified clusters might give different importance to the evaluated factors.

Table 5. Final cluster centers

	Cluster 1 *38%*	**Cluster 2** *32%*	**Cluster 3** *30%*	**F tests**
Information	,25509	-,48592	-,43395	64,040
Opinions	,21162	-,79976	,58661	55,628
Shopping habits	,27613	,56911	,26723	40,647
Health in food choice	-,41633	,28902	,79994	76,616

To better understand which aspects characterize the different groups, crosstabulation and Anova analysis to compare means has been done between them and several different variables; as well as on attitudinal variables and personal motivations and also socio-demographic aspects. With

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regard to the latter, our results suggest that these variables are not very different among the groups, except for the level of education (see Table 8 in Appendix 3). This confirms the findings of Urala (2005), Dagevos (2005) and Verbeke (2005) that show consumer demographic characteristics are only partially correlated with the acceptance of functional foods. Otherwise significant differences between clusters were found for the variable related to the existence of specific needs related to definite diet needs ($p<0.05$).

Moreover Anova analysis (see Table 6 in Appendix1) suggest that the three groups are differentiated mainly in relation to variables related to the consumers' perception of information ($p<0.01$). These findings confirm the results of some previous research conducted by Hailu and colleagues (2009) that also report significant differences between-clusters regarding health-related behavioral; while Cox et al. (2008) report significant differences concerning information.

Cluster 1 - Curious Consumers

The first cluster groups 83 individuals (38% of respondents) showing least interest in functional foods confirmed by the high concentration of occasional consumers who are unfamiliar with functional foods. In the cluster there is a greater percentage of consumers who say they know them only vaguely, they are unable to give any example of these products or they tend to indicate incorrect examples (respectively 36.5% and 37.7% in the cluster). As this group also has a propensity to buy functional products just out of curiosity or without a specific reason, this segment can be termed *curious consumers*. In evaluating purchasing and consumption habits, it should be emphasized that so-called curious consumers show less sensitivity to nutritional properties, as confirmed by the low frequency of reading nutritional labels, and give more emphasis to extrinsic attributes such as brand and price. In addition, this group concentrates several individuals who claim to have control of their health despite their food choices and state they are unwilling to reject their favorite foods for health reasons. We can argue, then, that these consumers show less attention to the impact that their food choices can have on their health status. This is confirmed by the negative relationship with the factor *health in food choices*. Finally, with regard to socio-demographic variables (although as indicated previously there are no statistically significant differences in the clusters) it is interesting to see how this group is the only one characterized by a higher incidence of men, who represent 38% of the total.

Cluster 2 - Confused and Skeptical Consumers

The second cluster includes 32% of respondents who have a strong interest in nutritional aspects, as shown by the relatively high importance assigned to this attribute, and a keen awareness about the links between diet and health issues. This is also confirmed by a concentration of individuals who have both fairly healthy food habits and lifestyle and by the major presence of individuals who have a special diet for health problems. Despite this characteristic, these consumers have no clear idea of the concept of functional foods. Compared to the other two groups the consumers in cluster 2 tend to confuse functional products with "light" or dietetic products or consider such products as special food for people with specific health problems. This confusion is also reflected in consumers' propensity towards functional foods. Indeed, this group is quite cautious towards these products because they fear they might have side effects. Furthermore, this group of consumers state they have some difficulties finding these products since it is not easy to

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distinguish functional from conventional foods, and they also consider functional foods limited in range. Another interesting element that distinguishes this cluster is the negative opinion expressed towards the information currently available, which is considered contradictory and mostly confused, scant and not always reliable. A negative opinion is also expressed with regard to the labels of functional foods, described as quite incomprehensible. Based on this evidence it is possible to classify this cluster as the *confused and skeptical consumer*.

Cluster 3 - Health-aware

The third cluster made of 30% of respondents groups individuals with a greater propensity towards functional foods, particularly attentive to health aspects in their choice of food and aware of the link between nutrition and health. They can thus be called health-aware consumers. This group has a greater presence of individuals who claim daily consumption of functional foods and who actually show a good level of knowledge of such products, confirmed by the high incidence of individuals who not only provided a correct definition but were also able to offer correct examples. In addition, this group aggregates consumers with a good level of awareness of functional foods, whereas the responses indicated there is a lower incidence of generic reasons for consumption. However, these consumers also complain that there are some difficulties in distinguishing these products from conventional and in interpreting the labels. Finally, it should be highlighted in relation to socio-demographic variables that this group has a higher incidence of women with a high level of education, as there is a greater concentration of university graduates or individuals with a master's degree.

Discussion and Conclusions

Functional foods have been amply shown to represent a rapidly developing and particularly promising market segment. This phenomenon is largely due to significant social changes in recent decades, such as increased life expectancy and increases in health costs related to diseases arising from poor dietary habits, which have led to increasing food demand for products with strong health connotations.

Consumer acceptance has regularly been identified as the decisive factor in the successful marketing of functional foods, with cognitive, motivational and attitudinal determinants of consumer acceptance of functional foods being widely explored in different countries (Bech-Larsen and Grunert 2003); (Cox et al. 2004); (Urala and Lahteenmaki 2004); (Verbeke 2005). However, with particular reference to the European market, most research in the literature focuses on northern European countries, which represent the most developed European markets, while surprisingly little research has been conducted in Mediterranean countries. Specifically, despite substantial growth opportunities for food businesses involved in supplying products with enhanced nutritional and healthy compounds on the Italian market, few papers have reported empirical studies of Italian consumer acceptance based on primary data collection (Messina et al. 2008); (Stewart-Knox et al. 2007); (Vassallo et al. 2009). The empirical analysis conducted in this study was therefore constructed to investigate the factors which lead consumers towards functional food products and verify the existence of market segments formed by consumers with similar preferences in order to explore the opportunities for further expansion of this market.

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Though not considered representative of Italy as a whole, since the sampling procedure was not appropriate to obtain a truly representative sample; our analysis provides interesting indications for functional food developers and marketers as well as government bodies charged with designing effective health programs. From a critical analysis of the results it may be stated that interviewed consumers, despite having a marked awareness of the link between diet and health and a high level of interest in the nutritional and health aspects of their consumption choices, are rather confused on functional foods. Similar findings were found in other studies conducted in other European countries (Bech-Larsen and Grunert 2003); (Bech-Larsen and Scholderer 2007); (Krygier 2007); (Urala and Lahteenmaki 2007). These consumers are often unaware of the term *functional food* or such like, but show considerable agreement with the concept, substantiating the results from previous studies. The analysis reveals that the degree of knowledge of these foods is quite poor, demonstrated by the fact that in many cases consumers have problems defining and distinguishing them from other types of similar products. This confusion is reflected clearly in the frequency of consumption which appears predominantly occasional; indeed, only in 12% of cases did respondents report daily consumption.

From multivariate analysis it emerged that a large number of factors influence consumers' propensity towards functional foods, related not only to their socio-demographic characteristics, but also attitudinal variables, as well as health in food choices and personal motivations to engage in health-conscious behavior. This confirmed the findings of similar studies elsewhere (Ares & Gambaro 2007); (Hailu et al. 2008). The image that consumers usually have of such products, relative to their taste, cost and market availability, also plays an important role in determining the greater or lesser propensity to purchase such products, as does the type and amount of trust in health-related information, consistent with the findings from other similar researches (Urala 2005); (Tuorila and Cardello 2002).

Cluster analysis based on the four factors revealed the existence of three different groups of individuals with a different degree of interest in functional foods, in relation to which it would be necessary to build different marketing strategies to capture the best opportunities offered by the market. The clusters found in our sample provide limited indications on the size of the corresponding segments in the national population, since respondents were not randomly recruited. Although this can be considered a minor issue as other published research, that do not aim to estimate segment sizes or market shares for particular product profiles, demonstrate (Hailu 2008); (Ares and Gambaro 2007); (Ares et al. 2009).

In particular, only the consumers in the third cluster (30% of respondents), defined as health-aware, displayed good knowledge of functional foods and thus a greater propensity to consume such products, unlike the first two clusters which had a concentration of individuals who appeared quite confused and skeptical about such products (Cluster 2, 32% of respondents) or who stated they bought them mainly out of curiosity (Cluster 1, 20% of respondents).

Interestingly, albeit showing a different degree of inclination towards functional foods, the three clusters denoted deficiencies in the level of information available about these products, considered by all three segments inadequate and often difficult to understand. Another element to highlight is the skepticism expressed by many respondents about the reliability of information, with particular reference to that conveyed through corporate advertising and through labeling.

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As confirmed by exploratory analysis, almost all the consumers sought more information, considering it necessary to implement information campaigns and public education. Moreover, descriptions on nutritional labels needed to be improved, and a logo or symbol introduced to call attention to the health benefits of the product.

These findings support the idea that information sourced from a trusted, credible and recognizable agency may have a positive impact on the valuation and the likelihood of acceptance of functional foods (Cox et al. 2008); (Hansen et al. 2003); Roe et al. 1999). Given these findings, it may be stated that to define the medium/long-term prospects of the functional products market two factors become crucial: the existence of a proper and clear flow of information between businesses and consumers, enabling sound evaluation of the benefits that may result from the consumption of the products; and full consumer confidence in companies and bodies called to protect consumption. Information that considers the consumer's perspective can help all food and nutrition communicators better connect with consumers and guide them towards informed and healthful food choices. Therefore, more clearly defined policies need to be developed for functional foods to avoid false health claims during the marketing process.

The results of our analysis suggest the need to focus mainly on education campaigns and communication from public authorities: although consumers attribute a high degree of confidence to the information conveyed by public authorities, such information is still scant on a nationwide basis. However, as underlined by Bech-Larsen and Scholderer (2007), such activities require enormous resources and may yield effects only after considerable lengths of time; hence, actors in the food chain and public health administrations will have to join forces to reach critical mass. Finally, given that consumers need to understand the benefits, not the science behind the product (Leathwood et al. 2007), more efforts would seem to be required to improve the clarity of messages in nutrition labels. As indicated by respondents, labels should use less medical-scientific language and seek to highlight more clearly the potential benefits of consuming these products.

Our research also confirmed that, for functional foods manufacturers in Italy to exploit existing market opportunities and target product development and marketing efforts to specific groups, further consumer studies are required. New research avenues should focus on identifying the needs and wants of Italian functional food users and seek to detect the most effective instruments that deliver simple and useful information to the final purchaser. Other interesting results provided by the present study (such as the importance of taste in purchasing a functional food, or consumer interest in a specific logo for such products) would benefit from additional qualitative and quantitative research methods to reinforce the legitimacy of our findings.

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Appendix 1

Table 6. Comparison between cluster averages

Variables[18]	Cluster 1	Cluster 2	Cluster 3	Total	Sig.
Importance of nutritional properties	3.7	4.8	4.3	4.4	.002
Importance of quality marks	2.8	3.5	3.8	3.4	.000
Importance of brand	3.6	2.5	3.3	3.1	.000
Importance of price	4.2	3.1	2.8	3.3	.002
Importance of origin	2.7	3.5	3.7	3.3	.000
Frequency of reading nutrition labels	3.2	3.3	3.7	3.4	.023
Monitoring my health independent of what I eat	3.3	2.9	2.6	2.9	.012
I don't give up the foods I like	3.8	3.5	2.8	3.3	.000
I fear they may have side effects	2.4	3.06	2.2	2.6	.005
Passing trend	2.8	2.4	2.2	2.4	.033
Intended only for those who have health problems	3.3	2.6	2.3	2.8	.001
I do not believe their properties	2.4	2.1	1.9	2.1	.026
I don't always understand but I consume it	2.9	3.6	3.5	3.3	.003
Difficult to find	1.9	3.6	3	2.8	.000
Less tasty	2.04	2.9	1.9	2.2	.018
Limited in range	1.9	4.05	3.6	3.1	.000
Difficult to distinguish	2.33	3.9	3.4	3.2	.000
Incomprehensible labels	2.7	4.05	3	3.3	.000
Clear and simple information	2.5	1.8	3.3	2.5	.000
Truthful and reliable information	2.4	1.9	3.3	2.5	.000
Satisfactory information	2.8	1.9	3.5	2.7	.000
Confusing and contradictory information	3.1	3.8	2.5	3.1	.000

[18] Variables showing significant differences with a probability level of 95%.

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Appendix 2

Table 7. Comparison between qualitative variables

Variables		Cluster 1	Cluster 2	Cluster 3	Sig.
Knowledge of functional foods	I know them vaguely	27.3	14.5	10.8	.038
	I know them quite well	21.6	23.3	18.5	
	I know them	32.5	38.6	38.5	
	I know them very well	18.6	23.8	32.2	
Functional food definition	Specific foods for health problems	7.2	8.4	4.1	.016
	Reduce the risk of disease	18.7	20.1	26.1	
	Light foods	12	18.2	5.8	
	Improve the organism functions	40.8	45.2	58.2	
	Do not know	21.3	8.1	5.8	
Number of correct examples	No example	36.5	21.6	13.2	.162
	<2	21	28.4	34.8	
	<4	4.8	4.5	25.3	
	Wrong examples	37.7	45.5	26.5	
Consumption frequency	Once	28.1	16.2	13	.414
	Seldom	55.8	48.2	31.9	
	Often	11.3	29.7	45.3	
	Daily	4.8	5.9	9.8	
Consumption reason	Improve my health	28.4	31.2	16.5	.062
	Strengthen my immune system	19.4	20.3	27.2	
	Prevent cardiovascular diseases	4.3	7.8	9.2	
	Improve gastrointestinal functions	12.7	11.2	30.6	
	Follow nutritionist's advice	4.3	7.6	10.4	
	Curiosity	22	16.4	6.1	
	No specific reason	7.4	5.5	0	

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Appendix 3

Table 8. Comparison of socio-demographic variables in clusters

Variables		Cluster 1	Cluster 2	Cluster 3	Sig.
Age group	18-25	4.8	14.9	8.7	.554
	26-35	25.3	24.3	27.5	
	36-45	43.4	39.2	31.9	
	46-55	20.5	13.5	21.7	
	56-65	4.8	5.4	5.8	
	66 - 75	1.2	2.7	4.3	
Education	Master	6.4	7.2	8.5	.032
	Bachelors degree	25.7	26	30.3	
	High school	59.2	60.8	56.4	
	Middle school	6.4	2.7	4.8	
	Other	2.3	3.3	0	
Gender	Men	37.3	32.4	24.6	.244
	Women	62.7	67.6	75.4	
Occupation	Employee	24.8	30.4	34.1	.840
	Self-employed	15.6	11.6	10.4	
	MD/paramedical	4.2	6.2	5.7	
	Housewife	22.9	19.5	25.5	
	Retired	3.8	5.8	6.3	
	Student	16.3	15.2	13.8	
	Other	12.4	9.3	4.2	
Origin	North Italy	32.5	43.2	31.9	.601
	Centre Italy	27.7	23	27.5	
	South Italy	39.8	33.8	40.6	
Specific diet	No	42.1	40.6	49.2	.026
	Yes – health problems	53.1	57.3	42.7	
	Yes- ethical reasons	4.8	2.1	8.1	
Lifestyle	Unhealthy	22.8	18.2	14.4	.256
	Average	63.4	63.2	61.4	
	Very healthy	13.8	18.6	24.2	
Eating habits	Unhealthy	24.5	18.9	15.7	.200
	Fairly healthy	75.5	73	81.4	
	Very healthy	0	8.1	2.9	

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