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## Short communications

# Functional foods development in the European market: A consumer perspective

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### ABSTRACT

An overview of the functional foods (FFs) market in Europe that ascertains the opportunities for further expansion of this segment is presented. Consumer behavior towards FFs was analyzed through a quantitative survey conducted on 400 Italian food shoppers. Our findings reveal that respondents are confused due to the ambiguity of what FF products are, and that consumers perceive products that are intrinsically healthy such as yogurt, cereals and juice, as preferable and credible carriers of FFs. Moreover, use of principal components analysis highlighted the key role played by the perception of healthiness in determining shoppers' attitudes towards FF.

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## 1. Introduction

Functional foods represent one of the most interesting areas of research and innovation in the food industry (Jones & Jew, 2007; Sirò, Kopolna, Kopolna, & Lugasi, 2008).

In Europe, FF sales have increased significantly; Germany, France, United Kingdom and the Netherlands represent the most important countries within the FF market (Jago, 2009). However, many other European markets are experiencing high growth rates, such as the Netherlands and Spain. In addition, the Euromonitor forecasted that sales of FFs would rise moderately from 2005 to 2009 in the newly emerging markets of Hungary, Poland and Russia (Benkouider, 2004).

Furthermore, demand for FFs within the EU varies considerably from country to country mainly due to food traditions and cultural heritage, and in general the interest of consumers in FF in central and northern Member States is higher than in Mediterranean countries (van Trijp & van der Lans,

2007). Niva (2000) as well as Niva and Makela (2002, 2007) indicated that the need for FFs is increasingly questioned in Northern European countries, hence yielding the conclusion that consumer acceptance of functional foods cannot be taken for granted. By contrast, attitudes towards FFs were more positive in Finnish consumers compared to consumers in Denmark or the United States (Bech-Larsen & Grunert, 2003).

## 2. Materials and methods

The success of FFs is widely recognized to depend on consumer acceptance of the products as part of the daily diet.

This contribution presents the results of a quantitative survey conducted on 400 Italian consumers, living in four Italian cities: Milan, Rome, Bologna and Naples.

General attitudes concerning food, nutrition and health; consumer awareness and interest in functional foods; motivation to buy this type of food or to reject it; knowledge and

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beliefs about specific benefits of foods are analyzed in depth. For the data collection a specific questionnaire was developed and administered to participants randomly recruited in shopping areas.<sup>1</sup>

From socio-economic variables emerges that respondents were predominantly women (66.6%), mostly in the 36–45 age group (22.5%). With regard to the educational level, nearly 2/3 of consumers had a high school diploma (56.8%) or a bachelors degree (30.2%). As for the marital status the data revealed that most interviewees were married or cohabited (60.4%), with children under 12 years in 31.6% of cases and with ill family members in 26.6%. With regard to occupation, 23% of respondents were employees, followed by 21% as independent professionals and by housewives (18%).

### 3. Results

Taking into account consumer familiarity with FFs, data analysis shows that consumers were not greatly informed about the concept of FFs. In many cases respondents created confusion with light and dietary products (20%), or FF was incorrectly associated with food for those who have specific health problems (16%). Moreover, 24% of respondents were unable to give a definition for FFs.

With respect to consumption frequency, 21% of respondents stated that they had never consumed these products while 28% were occasional consumers, followed by those reporting a higher frequency of consumption (24%) and daily consumption (15%). The lowest absolute incidence (12%) was of those who stated they had tasted FFs only once. Respondents who had never consumed FFs, stated that they had never tasted these products, mainly because they did not know their properties (32%) but also because they were doubtful about their potential benefits (17%), or considered FFs only suitable for the sick (15%) or simply because they were not interested in this kind of product (15%).

In order to highlight the influence of socio-demographic characteristics on frequencies of FF consumption a cross analysis was performed with the  $\chi^2$ -test. Gender and age were not significantly associated with the degree of knowledge and frequencies of FF consumption. Conversely, education, presence of children under 12 years and existence of an ill family member were significantly associated with knowledge (all  $p < 0.05$ ) while only presence of an ill family member was significantly associated with consumption frequencies ( $p < 0.01$ ). With regard to the latter, consumers who have an ill family member report a daily consumption of FF in 68% of cases (see Table 1).

Regarding the analysis of available information flow to consumers the results show that the main sources from which respondents obtain information are advertising (28%) and doctors/nutritionists (20%), followed by word of mouth (18%), product labels (12%) and television programs (10%), internet and the specialized press (7%). Only 5% of the information was acquired through public information campaigns.

**Table 1 – Socio-demographic profile of respondents.**

	Sample	Population <sup>a</sup>
<i>Gender</i>		
Male	33.4	48
Female	66.6	52
<i>Age</i>		
18–25	9.8	8.5
26–35	17.7	17
36–45	22.5	19.8
46–55	19.2	17.8
56–65	17.9	16.2
66–75	8.7	9.6
<i>Marital status</i>		
Single	27.6	27.8
Married/cohabiting	60.4	62.5 <sup>b</sup>
Separated/divorced	6.9	6.2
Widow(er)	5.1	3.5
<i>Education</i>		
Masters degree	9.6	
Bachelors degree	30.2	31.9 <sup>c</sup>
High school diploma	56.8	57 <sup>c</sup>
Middle school diploma	1.9	n.a.
Other	1.5	n.a.
<i>Profession</i>		
Employee	23	n.a.
Self-employed	21	n.a.
Doctor/paramedic	3.9	n.a.
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.
<i>Children &lt;12</i>		
Yes	31.6	
No	68.4	
<i>Ill family member</i>		
Yes	26.6	
No	74.4	

<sup>a</sup> ISTAT (National Statistics Institute) data, 2007.

<sup>b</sup> Italian total married population.

<sup>c</sup> Eurostat and OECD data (2009) for the population between 25 and 64 years old in 2007.

The sources in which respondents had most confidence were doctors and public entities, trusted by, respectively, 42% and 39% of consumers, while a lesser degree of confidence was given to producers and product labels, since 32% and 34%, respectively, stated that they did not know whether or not to trust them.

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. Almost all consumers liked to have more information (only 5.4% stated otherwise), considering it necessary to implement information campaigns and public education (23%) and improve descriptions on

<sup>1</sup> Although this sample is not strictly statistically representative, it includes respondents with a wide variety of socio-demographic backgrounds. Moreover, the distribution of age and education closely match the distribution in the national population.

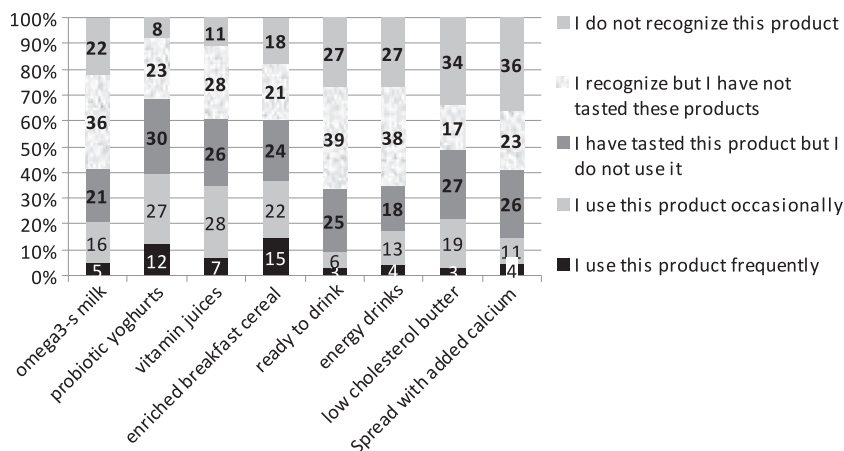


Fig. 1 – Degree of familiarity towards different FFs in %.

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

Subsequently the analysis focused on consumers degree of familiarity with several FFs. Respondents were shown eight different functional products, and were asked to express their opinion on a five-point scale (Fig. 1). The least recognized FFs were the spread with added calcium (36%) and low cholesterol butter (28%); whilst for the energy drink, ready to drink and enriched milk the vast majority of respondents stated that they knew but never tried it. Conversely, the most commonly consumed products we found were enriched cereals, probiotic yogurts and vitamin juices.

Through principal components analysis, we sought to verify the existence of latent factors that summarized consumer attitudes towards FFs in a smaller set of underlying dimensions which explain the inter-relations amongst an original variables. For this purpose 24 FF-related statements were formulated based on the aspects found in previous studies: taste, pleasure, security and familiarity (Urala & Lahteenmaki, 2003, 2007; Verbeke, 2005; Verbeke, 2006). For each statement respondents expressed their level of agreement on a five-point scale. Principal components analysis revealed the existence of three factors which together explain 64.7% of the original variance (see Table 2).

The first factor summarized eight variables related to the perception of *healthiness* of FFs and explains 27.8% of the variance. This factor included several statements that verify the respondents' opinions about the potential benefits associated with the consumption of FFs. Upon analyzing the mean scores in Table 2 it is clear that the main focus of this dimension was that using FFs improves one's health and promoted personal well-being. The negative correlation with statements such as *FFs were intended only for those who had health problems* and *FFs contained unnatural substances* probably indicated that respondents perceive these products as part of their daily diet.

The second factor contained nine items that described consumers' *confidence* in FFs and explained 21.4% of the variance. This factor described individuals' trust in the safety of FF and how far they believed the scientific basis of the information related to the health effects. What emerged from this factor was that respondents, whilst considering FFs to be top

science-based products and safe, were suspicious towards possible harmful effects of FFs, mostly if they were extensively used.

The third factor contained nine statements and described the degree of consumers' *satisfaction* of FFs. This factor, that explained 15.5% of the original variance, included statements that specifically reflected strictly personal feelings and judgments of the consumer with particular reference to the taste, price, and market availability of FFs. The analysis of mean scores showed that the respondents did not consider FF products completely useless or a passing fad, and that they do not perceive these products less tasty than conventional. Nevertheless, they consider FFs as more expensive than conventional products, that it was not easy to find FFs in the main food shopping outlets and considered the current available product range quite limited. Moreover, respondents stated that there were some difficulties in distinguishing functional from conventional products, denoting the complexity of the information contained on the label.

#### 4. Discussion of main results

The results of the explorative analysis revealed that Italian consumers were confused due to the ambiguity of what FF products were, 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 food choices. Similar findings were found in other studies conducted in other European countries. Hilliam (1998) found that in the United Kingdom, France and Germany, up to 75% of the consumers had not heard of the term functional food, but more than 50% of them agreed to fortify functional ingredients in specific food products. Krygier (2007) found that while in Belgium 49% of consumers were familiar with the term functional food, this ratio in Poland was only 4%. In addition, Szakaly et al. (2004) showed that in Hungary the expression functional proved unknown for about 70% of respondents.

Our results indicate that Italian consumers were more familiar with products that are intrinsically healthy such as yogurt, cereals and juice, as preferable and credible carriers of FFs. With regard to consumers demographic characteristics, our results highlight that gender and age

**Table 2 – Matrix of rotated components.**

Variables	Factors				
	Mean	Perceived healthiness	Confidence	Satisfaction	com <sup>a</sup>
FFs are likely to have a beneficial impact on my personal health	3.6	<b>.835</b>	–.038	–.134	.740
FFs can repair the damage caused by an unhealthy diet	3.2	<b>.777</b>	–.045	–.134	.590
FFs are intended only for those who have health problems	2.1	–.472	.044	–.143	.696
FFs promote my well-being	4.1	<b>.893</b>	.113	.584	.665
Consuming FFs improves my state of health	3.8	<b>.653</b>	.231	.598	.767
I can prevent disease by eating FFs regularly	3.2	<b>.384</b>	.166	–.069	.757
Functional foods make it easier to follow a healthy lifestyle	3.3	<b>.301</b>	.251	–.014	.625
FFs contain unnatural substances	2.4	–.289	.057	.231	
FFs are more expensive than conventional	4.2	–.259	.291	<b>.840</b>	.686
It is not easy to find these products	3.8	.179	.239	<b>.534</b>	.652
The range of FFs on the market is limited	4.1	.204	–.143	<b>.508</b>	.711
It's difficult to distinguish functional from conventional foods	3.6	.162	.107	<b>.421</b>	.709
I enjoy eating FFs	3.4	.231	.037	<b>.281</b>	.643
FFs taste worse than conventional foods	2.8	.332	.204	–.130	.790
The information on the label is difficult to understand	4.2	.214	.012	<b>.322</b>	
FFs are simply a passing fad	2.6	.125	.133	–.131	.810
FFs are completely unnecessary	2.0	–.374	.173	–.143	.851
The safety of FFs has been very thoroughly studied	3.4	–.184	<b>.809</b>	.139	.854
For a healthy person it is pointless to use FFs	2.4	–.288	–.596	.006	.832
FFs are top science-based products	3.8	.847	–.311	.004	.534
I fear that FFs may have side effects	3.2	.203	<b>.535</b>	–.102	.722
I'm cautious about the consumption of FFs	2.8	.018	–.133	.069	.697
I do not believe FF properties	2.3	.042	–.104	.067	.668
FFs are completely safe	3.2	.062	<b>.566</b>	.432	.526
If used in excess, FFs can be harmful to health	3.7	–.111	–.265	.389	.762
I trust the information given about health effects	2.4	–.152	<b>.633</b>	.209	.645
Eigenvalue		4.574	2.97	1.39	.646
Variance (%)		27.8	21.4	15.5	
Total variance (%)		27.8	49.2	64.7	

In bold the values of the variables that make up each factor.

<sup>a</sup> Extraction communalities are estimates of the variance in each variable accounted for by the factors (or components) in the factor solution.

are not significantly associated with the degree of knowledge and consumption frequency of FFs. Conversely, other studies have shown that female consumers are a more promising target group for FFs than men (Urala & Lahteenmaki, 2007), partly due to their higher interest in health in general (Childs & Poryzees, 1997). Concerning age, Poulsen (1999) mentioned that older participants in his research showed a greater intention to buy FFs; furthermore, Bhaskaran and Hardley (2002) suggested that older individuals showed different attitudes with regard to health claims and the type of functionality compared to younger consumers.

However, our results confirm that FF users were often more educated, and, as in Verbeke (2005), the existence of a family member with a specific health problem positively affected their acceptance of FFs.

Focusing on information on FFs, an interesting aspect that emerges from our analysis is that consumers would like more detailed news on these products, considering it necessary to implement information campaigns and public education activities, improve nutritional claims on labels and also introduce a symbol that might draw attention to the health bene-

fits of the food. Our results also show that consumer confidence in the information provided on FFs may vary according to the source and that respondents had a high degree of confidence in the information from doctors and public authorities while a lower degree of confidence was afforded to producers. These results are consistent with the studies of Urala and Lahteenmaki (2003) who showed that Finnish consumers were very confident with health-related information coming from the authorities and quite confident with information from newspapers, retailers and food manufacturers. Our results 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 FFs (Roe, Levy, & Derby, 1999).

Therefore, one of the most important aspects for FF manufacturers is to communicate the health effects reliably to the final consumer (Nicolay, 2003; Poulsen, 1999). The consumers' demand to include a specific logo on the label is particularly important to note, since at the moment in Europe the term "functional food" does not appear on food packaging,<sup>2</sup> whereas in Japan there is a specific logo that identifies Foods for Specified Health Use (FOSHU).

<sup>2</sup> In Europe the only step forward in legislation in this area was made in 2006 with the approval of EC Regulation No. 1924/2006 concerning nutrition and health claims on food products.



Investigating consumer attitude towards FFs through the principal components analysis, we found three dimensions that recall some aspects found in previous studies (Poulsen, 1999; Urala & Lahteenmaki, 2007). Our analysis showed the key role played by the perception of healthiness in determining the shoppers' attitudes towards FF. This means that approval of FFs has a strong utilitarian connotation as their usage should entail expectations of consequences. Many authors have stressed this component of FFs as their capacity to fulfill a more complex state of consumer well-being, which also implies psychological and mental aspects (Menrad, 2003; Niva, 2007; Roberfroid, 2002; Sirò et al., 2008). This view shows the key role of available information for the consumer in order to truly assess the healthiness of the products. This particularly holds for newly developed functional ingredients for which there are strong needs for specific consumer information and communication activities (van Kleef, van Trijp, & Luning, 2005).

The second factor found in our analysis concerns consumer confidence in FFs described whether individuals felt these products were safe and to what extent they believed in the scientific basis underlying the information on their health effects. Also Urala and Lahteenmaki (2004, 2006) in their research in Finland found that confidence in FFs seemed to be the most crucial factor in consumers' willingness to use these foods. Moreover, respondents were suspicious of possible harmful effects of FFs. We can state, in line with Frewer, Scholderer, and Lambert (2003), that the perceived risks of FFs can be a strong barrier to the consumption of such products.

As for the satisfaction factor, findings of this work demonstrated that consumers did not perceive FFs less tasty than conventional ones. This is an interesting outcome given that other consumer studies have shown that taste is one of the main conditions for acceptance of FFs (Tuorila & Cardello, 2002; Verbeke, 2006).

The results of this study also showed that high price, difficult availability and limited range can be considered the main obstacles to purchasing these products. With reference to high FF prices, examples of recently launched products indicated that consumers were only willing to accept limited price premiums for such products<sup>3</sup> (Sirò et al., 2008). Therefore, relatively high price premiums can be regarded as one reason for the limited market success of several FF products introduced in recent years in Europe. Krystallis, Maglaras, and Mamalis (2008) also state that the demand for fairly-priced FFs by young adults could be an indication for companies to develop more tailor-made pricing policies for functional product types, targeting different consumer segments.

Regarding the limited availability of FFs in traditional food retailers pointed out by interviewees, recent research has focused only tangentially on this issue. However, the scant accessibility of FFs could be due to the novelty of these products and to their recent development.

## 5. Conclusions

Results derived from this study provide insight that may contribute to more effective strategic and tactical marketing decisions. Furthermore, our findings may be useful for government bodies interested in designing public health programs. In terms of marketing strategies, FFs need to be promoted with the aim of making them much more visible and recognizable to final consumers, in order to avoid confusion with other generic health foods, such as light or diet products. Since the present analysis highlighted that the perception of healthiness is the main factor affecting consumer attitude towards FFs, firms should focus their marketing strategies on reinforcing FF properties and trying to communicate them clearly and less scientifically. In this regard, in line with findings elsewhere, the role of labeling should be strengthened, perhaps also with the introduction of a specific logo that could better distinguish such products in the market. Furthermore, taking into account the importance of consumer trust in health claims, more clearly defined policies need to be developed for FFs to avoid false health claims during the marketing process.

In terms of public interventions, the results of our analysis suggest the need to focus mainly on education campaigns and communication since consumers have a high degree of confidence in the information conveyed by public authorities.

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<sup>3</sup> In general, price premiums of 30–50% are observed in high volume FF segments like functional dairy products or ACE drinks (Menrad, 2003).

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