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Analysis of Consumer Attitudes and Consumers' Willingness to Pay for Functional Foods

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ABSTRACT

The objective of this study is to analyze consumer behaviour in relation to functional foods by a direct survey. To this end, the proposal is an analysis of the reasons for choosing to consume this type of food or not, accompanied by a supplementary investigation, mostly to assess the relationship between consumption patterns and willingness to pay (WTP) for the most common categories of functional foods, such as milk fortified with CLA (conjugated linoleic acid).

Our research shows that a proportion of the population is unaware of the existence of functional foods and their properties. Moreover, it shows that when the concept of functional foods is explained to consumers, this creates a greater willingness to pay for such food, which is strongly linked to type of product carrier but not greatly to income. So the knowledge and transparency of information appear to be decisive variables in the process of choice, with significant implications in terms of policies for classification, labelling of food and public health.

Keywords: functional foods, willingness to pay, consumer-directed survey

1 Introduction

The twenty-first century was marked by continued progress in the field of nutrition science: the discovery of nutrients, the guidelines for a healthy diet and the concept of a balanced diet have accompanied the evolution of increasingly dynamic food. First came the power to eradicate malnutrition and, later, an attempt to limit excesses in the use of certain substances that are harmful to health (Welsch, 1996).

Today nutritional science is ready to face new challenges, including that linked to the spread of "functional food" (Ashwell, 2001). This new concept was born in the 1980s in Japan, and was adopted in the late 1990s in the West. Due to various factors, such as alarm related to biotechnology and the progressive attitude to personalization of diet, modern consumers have shown increasing attention to the diet-health relationship and an increased awareness of the healthiness of food (Belletti, Marescotti, 1996, Ural, Arvola and Lähteenmäki, 2003; Caswell, Siny 2006; Marette et al. 2010).

One of the main reactions to these evolutionary trends has been the development of functional foods to maintain health and the introduction of a large quantity of products labelled with information on nutrition and function: *health and functional claims* (Katan, De Roos, 2004). The functional food market is however characterized by a strong information asymmetry that assign them to the "credence good" category, since often the consumer is not able to verify the claims' veracity, even after consumption.

A standard identification of the category of functional foods is however quite complex. Although there exists a scientifically recognized definition, published in 1999 in the British Journal of Nutrition, the result of concerted action between the International Life Science Institute and the European Commission, no

Western country has produced a legally-binding definition.

Furthermore, if the definition in question is derived from the Consensus Document[*], in which it is described, it is almost impossible to clearly define that category.

Indeed, this document states that "*a food can be regarded as 'functional' if it is satisfactorily demonstrated to affect beneficially one or more target functions in the body, beyond adequate nutritional effects, in a way that is relevant to either an improved state of health and well-being and/or reduction of risk of disease. Functional foods must remain foods and they must demonstrate their effects in amounts that can normally be expected to be consumed in the diet: they are not pills or capsules, but part of a normal food pattern".* (Diplock et al.,1999).

Therefore, according to this definition, "functional foods" may be considered as technologically advanced and improved foods, such as products enriched with polyunsaturated fatty acids (ω3 and ω6), those with added biologically active substances (plant sterols), or those enriched with probiotics (live cultures with healing properties) (Ashwell, 2004) as well as more conventional ones, such as green tea (for the content of catechins) (Hrelia et al., 2009), garlic (for hydro and lipo-soluble substances that possess anti-cancer and anti-cholesterol properties) and olive oil (for tocofenols, carotenoids, substances of phenolic origin and about 200 other minor components that constitute it) (Cocchi, 2007). These definitions may be risky, as provocatively stated by Katan and De Roos (2004), that *"even tap water could be called a functional food, because a liberal intake of water prevents cystitis, as well as kidney and bladder stones".*

Since the range of functional attributes is very large, there exists a real risk that the widespread use of fortified foods or foods depleted of nutrients, accompanied by promises of health benefits that are difficult to verify in the short term, leads to increasing confusion and, paradoxically, increases distortion in the perception and choice of how to have a proper and balanced diet.

For this reason, while unable to solve the problems associated with too vague a definition, EFSA, in its role as third-party defender of the consumer, has tried to curb this risk by reducing the information imbalance in this sector, through "action for monitoring and evaluating the correspondence between the beneficial effects declared on product packaging and scientific demonstrations of the same" (EFSA, 2009).

Within this context, given the increased consumption of these foods in recent years, also in the European market (Hilliam, 2000; Shah, 2001; Weststrate et al., 2002; Frewer, Sholderer, Lambert, 2003; Verbeke, 2005; Mintel International – Jago, 2009; AC Nielsen-Nucci, 2009; AC Nielsen-Feenstra, 2009) and given the growing attention from the institutional, scientific and industrial bodies involved in this category of products, the objectives of our work were to understand the degree of consumer knowledge with respect to the definition of functional food, the awareness of the presence of such products on the market, the reasons for the purchase or non-purchase of these foods , the relation between consumption/non-consumption of functional products and people's lifestyles and food styles, and finally the evaluation of the characteristics that affect willingness to pay more for functional foods. Specifically, the analysis addressed two objectives: the first was to identify emerging consumer profiles through an exploratory analysis in order to obtain conceptual categories for easier analysis and interpretation (consumer groups), while the second was to explain the characteristics (socio-demographic, lifestyle, knowledge, etc) that are most important in determining a higher probability of willingness to pay higher prices for products with the same "guaranty" of functionality by using an econometric model.

Our work focused attention on the category of dairy functional food (fortified with CLA-Conjugated Linoleic Acid) which, to date, has been the most subject to innovations aimed at improving health content – both real and perceived (AC Nielsen - Feenstra, 2009; Mintel International - Jago, 2009; Maynard, Franklin, 2003; Bonanno, 2009).

[*] ''Scientific concepts of functional foods in Europe: Consensus Document". *British Journal of Nutrition*, Vol.81:1-27.

2 Methodology

To obtain the information necessary for the analysis, it was decided to administer a semi-structured questionnaire. For the questions, we preferred to use a funnel sequence (from more general questions to more detailed ones), placing those considered sensitive to the end. The questions were grouped into eight sections, plus a filter question used in order to select those responsible for food purchase within the household and this resulted in the selection of a sample mainly composed of women.

The sections of the questionnaire were as follows:

- Sec. 1 - Shopping habits
- Sec. 2 - Sources of information which influence decisions when purchasing food
- Sec. 3 – Knowledge of relation between diet and health
- Sec. 4 - Knowledge of functional foods and a test question
- Sec. 5 - Reason and how to purchase functional foods
- Sec. 6 - Lifestyle
- Sec. 7 - Willingness to pay for foods fortified with CLA
- Sec. 8 – Socio-demographic profile.

To test the functioning of the questionnaire, it was first piloted on a sample of 20 persons in the manner suggested by Aaker and Day (1986). The questionnaire was found to be easy to understand, with an average time of 20 minutes to complete.

During the period between March and May 2009, 163 questionnaires were administered face to face in the cities of Bologna, Rome and Bari. (Table 1)

Table 1.
Technical sample

Characteristics	
Target	Italy – Regions North - Bologna Central- Rome South – Bari
Field	Responsible for household food expenditure
Sample	163 interviews
Sampling	Non probabilistic sampling
Timing	2nd March – 30th May 2009

Sampling was non-probabilistic with rational choice, based on a sample of people aged between 20 and 80 years, who were responsible for food expenditure for the family of reference (Table 2). The sample was distributed in three cities in the three major regions in Italy: north, central and south (55 questionnaires in the city of Bologna, 55 in Rome and 53 in Bari). Interviews were conducted near outlets of large retail chains. Table 2 summarizes the main characteristics of the sample.

Table 2.
Main characteristics of the sample

SAMPLE		
Household size		2,6
Age group		
	20-34	32%
	35-49	30%
	50-64	31%
	65-80	7%
Education level		
	Primary school	2%
	Junior high school	6%
	Senior high school	45%
	University	47%

Source: direct investigation

3 Exploratory Analysis

To achieve the first goal, that is, to identify homogeneous groups of consumers and then evaluate their prevailing consumption patterns, we referred to a method of multivariate analysis and, in particular, the concatenation of Multiple Correspondence Analysis (MCA) and Cluster Analysis (CA).

From the methodological point of view, one of the strengths of this technique is that it does not impose any structure to the data but it subsequently highlights the relationships between the variables considered. On that basis, we were able to proceed to the definition of consumer clusters, grouped according to the reports of similarity and dissimilarity within the same data structure.

After identifying, by means of MCA, the main dimensions that drive the phenomenon, we proceeded to the cluster analysis, the objective of which was the creation of homogeneous groups of individuals (Hair et al., 2007). This step allowed us to obtain uniform clusters, which were very different from each other cluster. The interpretation of clusters was based on the most significant variables (graded according to a test of significance), thus allowing us to have different profiles[†].

4 Econometric Analysis

To analyse the characteristics that increase the willingness to pay (WTP) for functional foods and identify which variables determine the likelihood of a greater WTP, the interviewee was provided with information (in one paragraph of about 30 lines) on the functional properties of CLA and then asked to declare his/her willingness to pay more for three specific dairy products (milk, butter and yogurt) fortified with this molecule. A logistic regression model was used for analysis of data obtained, in which the dependent variable used assumes the value of 1 if the consumer declared his willingness to pay more for functional foods with a level of certainty of at least 70%, and value 0 otherwise.

The formal specification of the model used was as follows

$$P_i = P(Y_i = 1 | X_i) = E(Y = 1 | X_i) = \frac{1}{1+e^{-(\alpha+\beta X_i)}} = \frac{1}{1+e^{-Z_i}} \quad (1)$$

which was intended to show the impact of independent variables on the likelihood that a consumer will consume functional foods or not. X_i is the set of independent variables and, as in standard regression models, α is the intercept and β is the vector of coefficients for the vector of independent variables. The last part of the equation

[†] The data base available was organised so that the information collected by questionnaires could be elaborated and then analysed with SPAD V 5.0 software (Système Portable pour l'Analyse des Données).

$$P_i = \frac{1}{1+e^{-Z_i}} \tag{2}$$

represents the logistic distribution which takes on a value of between 0 and 1; this possibility warrants that for each estimated X_i, the value of P_i can be interpreted as a probability. In other words, the condition is that $0 \leq E(Y_i | X_i) \leq 1$ (Wooldridge, 2002). This is one of the main reasons why a logit model was implemented for this analysis.

In order to estimate P_i the equation (2) must be rewritten so that it is linear in X_i and β. Therefore, in order to make the estimation, the logit model was specified as:

$$\ln\left(\frac{P_i}{1-P_i}\right) = \alpha + \beta X_i + \varepsilon_i \tag{3}$$

In (3) the dependent variable is the logarithm of the ratio of frequency of consumption of functional foods, while ε_i represents the stochastic disturbance term. The estimated parameters, $\hat{\beta}$ can be interpreted as a change in the frequency of the likelihood that a consumer will buy functional foods. Positive values of $\hat{\beta}$ imply that the growth of the variable X_i will increase the likelihood that the interviewee will purchase functional foods; negative values imply the opposite (Gujarati, 2003).

To determine which variables can be included in the model, it is possible to implement a method of screening before or after the estimate, based on the significance of the estimated parameters. Many other tools can be used for an overall assessment of the estimated logit model (Wooldridge, 2002) and this work has made use of the likelihood ratio test. This considers the simultaneous presence of null values for all the coefficients β as null, that is, that the model does not explain anything about the variation of the dependent variable Y_i. This null hypothesis is rejected if the likelihood ratio test is greater than the value of Chi-squared (χ^2-value) with degrees of freedom equal to the number of

independent variables used in the model. Concerning the adaptability of the model, the software used for the estimate (Microfit) provides the values of 'R^2, which may be interpreted as the proportion of the total variance explained by the model. However, as demonstrated by Gujarati (2003), the adaptability of the model assumes secondary importance in discrete choice models, while the signs and the statistical significance of estimated parameters take on primary importance.

In the logit model implemented in this analysis, in order to examine how socio-economic factors influence the willingness to buy functional foods, the following were used as independent variables: the place of purchase, purchase frequency, age and the level of education, attention to nutritional value, price and experience of consumption declared, buying habits and above all consumption habits (consumption of foods low in sugar and salt), and finally, the degree of knowledge of functional foods and the consumer perception of the use of these products in terms of lifestyle (regular check-up, physical activity and dietary change).

5 The results of exploratory analysis

Cluster analysis identified four homogenous groups of consumers (clusters) defined by the variables considered most representative in the explanation of the phenomena investigated.

- The first group represents 29% of the total and consists of "uninformed consumers." These people mainly belong to the 50-64 age group (51%), characterized by an average-to-high level of education and the prevalence of low-to-average income. This cluster is homogenous regarding its knowledge; in particular, these are consumers who claim not to know any type of functional foods, have never bought such foods, do not wish to do so in the future, and therefore cannot express any opinion on the matter. They are uninformed on the issues specifically related to food, and are unaware of the food-health relationship. Ultimately, this profile possesses little information or awareness related to food consumption and is most likely to carry out merely routine purchasing.
- The second cluster, 14% of the total sample, are "consumers concerned about their health." Within the group were interviewees with the highest average age (49 years), characterized by a high level of education and average income. These are consumers who seem to be familiar with functional food, have bought it and continue to do so. The main reason for purchase is the possibility of being able to combat a specific health problem, which leads them to choose functional foods. Their knowledge is also associated with a good awareness of the link between health and eating accompanied by “cautious” eating habits (these consumers pay attention to the consumption of salt and sugar, etc.).. They also believe that proper nutrition is not sufficient to guarantee adequate health benefits and that it is necessary to supplement their diet with nutrients or concentrates; in this context, they agree with the statement that "functional foods bring about a real benefit to health.”

- The third group are "conscious consumers", representing 29% of the sample. Consumers in this group had a mean age of 40 years, they often had children under the age of 10, their level of education is mostly high (63% are graduates) and their income is average-to-high. Their knowledge of functional foods, is transversal to the major product categories. These consumers say they are firmly convinced of the real benefits of functional foods, but, nevertheless, the purchase of such products is not frequent and only covers those foods most advertised. As for their attention to health, many of these consumers say they have changed diet in recent years in favour of eating behaviours considered as healthier (with plenty of fruit and vegetables), they pay attention to the nutritional content of food, as well as the presence of fat, sugar and salt etc, and they even purchase food supplements.

- The final group includes "Non health-conscious consumers" and is made up of 28% of interviewees. These consumers have the largest families and their family unit is characterized by a greater number of young children as well as elderly people. Their income is low-to-average, while their average education level is high. Their knowledge of functional food is greatly influenced by advertising, They know the most popular products with health claims and claim to have bought food due to their curiosity aroused by advertising. This group has never bought or shown interest in food supplements or similar products. They are less aware than the first group of the relation between food and health, they do not pay attention to possible risk factors (high cholesterol, etc.) and often prefer to use convenience foods. The main empirical evidence arising from the analysis appears to be consistent with the most important results which emerged in other studies (O'Connor et al., 2006; Wadolowska et al., 2008, Hu et al., 2009).

The following are the main features that define the four consumer profiles described with reference to the most important socio-demographic variables and to comparison with the overall distribution of the sample (Table 3-4-5).

Table 3.
Main characteristics of groups and comparison with the sample mean

Cluster	%	Age mean	Household size	% of family with child younger than 10	% of family with person holder than 65
uninformed consumers	29%	48	2,5	6%	11%
consumers concerned about health	14%	49	2,8	17%	13%
conscious consumers	29%	40	2,8	21%	4%
Non health-conscious consumers	28%	39	3,1	18%	22%
Total	**100%**	**43**	**2,8**	**15%**	**12%**

Source: direct investigation

Table 4.
Characterization of groups with regard to education levels and comparison with the sample mean

Cluster	Primary school	Junior high school	Senior high school	University	Total
uninformed consumers	2%	9%	49%	40%	100%
consumers concerned about health	-	-	52%	48%	100%
conscious consumers	-	4%	33%	63%	100%
Non health-conscious consumers	4%	7%	51%	38%	100%
Total	**2%**	**6%**	**45%**	**47%**	**100%**

Source: direct investigation

Table 5.
Characterization of groups with respect to income and comparison with the sample mean

Cluster	Less than 10.000 €	From 11.000 to 20.000 €	From 11.000 to 35.000€	From 36.000 to 50.000€	From 51.000 to 75.000 €	More than 75.000 €
uninformed consumers	4%	19%	40%	21%	13%	2%
consumers concerned about health	-	13%	65%	22%	-	-
conscious consumers	2%	25%	25%	29%	17%	2%
Non health-conscious consumers	7%	18%	33%	29%	9%	4%
Total	**4%**	**20%**	**37%**	**26%**	**11%**	**2%**

Source: direct investigation

6 Results of the econometric analysis

The econometric analysis was implemented for three different products, that have the same functional properties: milk, butter and yogurt. The reason for this was the possibility, as suggested by other empirical studies (Bonanno, 2009), of observing different consumption patterns emerging within the same category of functional foods (dairy produce) and, therefore, the ability to identify different variables of the same or dissimilar impacts, which determine the consumption of different products with the same functionality.

The evidence derived from the logit model used to identify the elements that influence WTP for milk are summarized in Table 6.

The analysis shows the importance of the variables "knowledge of functional foods," "young age" and "lifestyle" (with the combined presence of physical activity and dietary change) and "purchase in

supermarkets" linked with a higher probability to declare a greater WTP, while the link between higher income and greater willingness to pay is negative. This possibility seems to emphasize the fact that a greater awareness of the qualities of functional foods, people's identification with particular lifestyles and the pursuit of a healthy life, are more important than price and disposable income. These results reflect findings in other studies and indicate that young age, knowledge of functional products and a healthy lifestyle are extremely important factors in determining a higher WTP (De Francesco, Galvan, 2005; Bonanno, 2009, Del Giudice et al. 2009). In particular, a study conducted by Maynard and Franklin (2003) on WTP for milk products enriched with CLA shows how knowledge of nutritional principles, the perception of the link between food and health, and adopting a healthy lifestyle are all important in influencing a greater WTP.

The result obtained by the application of the econometric model to data for milk is as follows:

$$WTP_{MILK} = -\text{cost} - \beta_1 \text{Revenue class} + \beta_2 \text{ Younger age} + \beta_3 \text{ Lifestyle} + \beta_4 \text{Knowledge} + \beta_5 \text{Supermarket.} \quad (4)$$

Table 6.
Factors affecting a greater WTP for Milk
(Logit Maximum Likelihood Estimation)

Variabile	Coef.	Std Error	T-Ratio[Prob]
Cost	**24302**	**15753**	**1.9427[.054]**
Income	**41661**	**14808**	**2.8133[.005]**
Younger age	**30514**	**14856**	**2.3640[.041]**
Lifestyle	**28387**	**14239**	**3.2635[.003]**
Knowledge	**38594**	**15633**	**4.1340[.011]**
Supermarket	**1.9582**	**40089**	**4.8847[.000]**

Factor for marginal effect computations = .24585
Maximized value of the log-likelihood function = -140.3430
Akaike Information Criterion = -144.3430
Schwarz Bayesian Criterion = -151.2536
Hannan-Quinn Criterion = -147.1293
Adaptability = .68803
Pesaran-Timmermann test statistic = 5.7977[.000]
Pseudo-R-Squared = .13015

Applying the model to data for yogurt is summarized in Table 7.

The results show a similarity between the variables identified here and those previously noted. That is, the variables "knowledge of functional foods," "young age" and "lifestyle" (together with physical activity and diet change) as well as "purchase in supermarkets" influence the increased WTP declared by the consumer. There is no link, however, between income and higher WTP for functional foods. There is a strong influence of diet factors, probably due to the ease of consumption of yogurt, consumed as it is often outside the home and as a substitute for meals. The results of this second analysis reflect what has already emerged in a recent study (Bonanno, 2009), which highlights a greater propensity to consume functional yogurt (drinkable) by Italian consumers with a healthy lifestyle, but also by those who want to increase or maintain their state of health, such as people with chronic diseases.

$$WTP_{YOGURT} = -\text{cost} - \beta_1 \text{Revenue class} + \beta_2 \text{ Younger age} + \beta_3 \text{ Lifestyle} + \beta_4 \text{Knowledge} + \beta_4 \text{Supermarket} + \beta_4 \text{Diet.} \quad (5)$$

Table 7.
Factors increasing WTP for yogurt
(Logit Maximum Likelihood Estimation)

Variabile	Coef.	Std Error	T-Ratio[Prob]
COST	**67111**	**.16335**	**4.1084[.000]**
Revenue class	**27565**	**14201**	**1.9411[.053]**
Diet	**.23247**	**14296**	**1.9861[.050]**
Younger age	**.21233**	**.14143**	**1.9213[.054]**
Lifestyle	**1.1214**	**31781**	**3.5285[.001]**
Knowledge	**.41329**	**15633**	**4.1340[.011]**
Supermarket	**73762**	**39021**	**4.8847[.000]**

Factor for marginal effect computations = .24103
Maximized value of the log-likelihood function = -146.9309
Akaike Information Criterion = -151.9309
Schwarz Bayesian Criterion = -160.5692
Hannan-Quinn Criterion =-155.4138
Adaptability = .65385
Pesaran-Timmermann test statistic = 3.9362[.000]
Pseudo-R-Squared = .072445

The results obtained from applying the logit model to data on butter consumption are presented in Table 8. Again, as previous evidence seems to confirm, the important variables which increase WTP are "knowledge of functional foods", "lifestyle" (together with physical activity and diet change) and "purchase in supermarkets". Moreover, as with yogurt, the variables referring to a particular attention to diet, in this case, "reduced salt intake" and "reduced sugar intake" also increase WTP. Unlike the two previous cases, "young age" is substituted with "adult " and, contrary to that recorded for other products, there is a positive link between increased WTP and income. These aspects appear to emphasize the fact that, as butter is a food complementary to meals prepared at home, and thus used by people who probably spend more time preparing food, it is seen by the younger age group as a little-used "accessory" and therefore not worthy of a higher price. The reasons for this might also be found in the negative connotation that the product has in the minds of some consumers, and therefore in the ambiguity and contradiction created between a positive functional characteristic and food perceived as unhealthy.

The result achieved by the application of the econometric model for data on butter is as follows:

$$WTP_{BUTTER} = +cost + \beta_1 Revenue\ class + \beta_2\ Adult + \beta_3\ Lifestyle + \beta_4 Knowledge + \beta_5 Supermarket + \beta_5 Diet. \quad (6)$$

Table 8.
Factors increasing WTP for butter
Logit Maximum Likelihood Estimation

Variabile	Coef.	Std Error	T-Ratio[Prob]
COST	**33118**	**13628**	**2.7856[.054]**
Income	**41661**	**16527**	**3.8133[.004]**
Diet	**81764**	**42123**	**1.9411[.053]**
Adult	**30514**	**16724**	**4.1578[.005]**
Lifestyle	**43112**	**14239**	**4.1146[.002]**
Knowledge	**41329**	**15633**	**4.1340[.011]**
Supermarket	**73762**	**39021**	**4.8847[.000]**

Factor for marginal effect computations = .20778
Maximized value of the log-likelihood function = -116.6536
Akaike Information Criterion = -122.6536
Schwarz Bayesian Criterion = -133.0196
Hannan-Quinn Criterion = -126.8332
Adaptability = .77778
Pesaran-Timmermann test statistic = 6.9658[.000]
Pseudo-R-Squared = .20109

The decision to differentiate the products is justified in the light of the empirical results. Although some variables (knowledge, lifestyle and place of purchase) seem to be a constant fundamental in determining a greater WTP, it can be observed that other features are specific to each product. This suggests that, with the same "functionality", the WTP is different according to the product and therefore its degree of use or the perception of health aspects, elements which tend to vary depending on socio-demographic factors (in this case, age and income).

7 Conclusions

The analysis provides interesting insights that provide an empirical scenario which is complex but clear concerning key factors that drive demand for functional products.

The results show a real interest in functional foods and a consistent approach to this type of product, albeit in different ways and with different aims. The use of cluster analysis revealed the presence of four emerging consumer profiles, each characterized by specific dynamics: purchase targeted by those who, concerned about their health, are looking for foods that can preserve or improve it ; conscious behavior driven by the conviction of the benefits of functional foods, although they are rarely integrated into the diet, as well as an occasional purchase entirely the result of curiosity aroused by advertising and probably, as often happens when novelty is concerned, in most cases often not repeatable. However, the analysis indicates the presence of consumers who are also completely uninformed and unaware of the existence of functional foods and therefore do not intend to buy them.

These results highlight the crucial role that information and knowledge can bear in market dynamics (Akerlof 1970; Nelson, 1970) and to what extent they actually affect the demand for new products, especially with *credence* food, with nutritional and functional characteristics that have a long time projection that is hard to verify in terms of efficacy (Verbeke, 2005).

The problem of information in the field of functional foods is linked in particular to the credibility of claims and the presence of unbalanced information (Ashwell, 2001; Katan and De Roos, 2004; Robertfroid, 2002). It is apparent how consumers make their decisions also based on the information on product labels or in advertising campaigns. If the users of these products are therefore unable to recognize or accurately identify food which is really functional because the information is unreliable or misleading, their willingness to buy such products may decrease, as well as their acceptance of a premium price associated with functional characteristics. This not only determinines the failure of the market but also severely limits the incentives for the development of such products.

It is therefore reasonable to assume that, if the cause of market failure is unbalanced information, then better information and greater transparency may contribute significantly to reducing the negative effects of this unbalance (Lusk, Hudson, 2004). Thus legislation is necessary in order to lay down clear and precise rules. This would help to develop a more competitive and transparent market (Unnevehr et al., 1999, Cash et al., 2004). In this way, functional foods could "leave" the area of *credence goods*. This would have positive effects on the functional food market and on the health "market", particularly with the reduction of social costs associated with illnesses due to nutrition.

The importance of these elements is confirmed by the results obtained from the second step of analysis designed to assess the factors that affect a greater WTP. In particular, it appears that the consumers who are more health conscious, who lead a healthy lifestyle and who are aware and informed on the link between nutrition and health are the ones who declare a greater WTP for functional foods. So, "educating" the consumer, making him/her more aware of food choices is certainly a key step in ensuring that these foods may be a useful tool for a proper diet.

It should also be noted that not all products under investigation are perceived by consumers in the same way. In fact, functionality being equal (all foods fortified with CLA), the greater WTP varies according to the product's inherent characteristics, to how it is perceived and to its usability.

It is therefore important to identify which functional principle must be conveyed and for what segment of the population in order to better determine the most suitable product carrier. But it is also important to identify the type of message and how to transmit it.

The functional products market has grown strongly in recent years, showing that the demand for food devote an increasing attention for functional attributes. People are also willing to spend more on food with higher nutritional value and good health-effects (Del Giudice et al., 2009, Maynard and Franklin, 2003). An increasing demand for functional products (and health information) encourages producers to provide more positive guidance on food, as this can generate more sales and higher profits. However, it also creates the incentive to market products that are not really functional and that merely tend to capitalize on the benefits of an expanding market without bearing the costs of real innovation.

For these reasons, proper labeling and clearer and more effective legislation would be a useful tool for both consumers and producers, contributing to the achievement of social objectives and reducing the phenomenon of market failure. If reliable information is used, it is possible to carry out four main objectives (Golan et al., 2002):

1) increase consumers' awareness of food safety and health;

2) promote access to information *tout court*;

3) promote fair competition between producers and the marketability of products;

4) influence individual consumption choices to align them with social objectives.

In conclusion, based on the literature reviewed and the most important empirical evidence resulting from the analysis, future research should be oriented towards providing a more accurate picture of consumer behavior and can define the factors that influence the purchase and consumption of functional foods. Only in this way can we provide the necessary tools to key stakeholders to support market development in line with public health objectives.

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