Consumers’ Requirements for Functional Foods

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Abstract

Although there is still no legal definition, functional foods are considered by the scientific community as providing additional benefits beyond the general benefits of nutrient intake and satisfaction of hunger. The bioactive compounds present in these products should provide a scientifically proven health benefit for the prevention, management or treatment of chronic disease. The aim of the present study was to investigate the consumers’ awareness, knowledge and interest for functional food consumption. The study was conducted on 120 respondents that answered a 16-questionaire distributed online. The participants were adults from rural and urban area, with different levels of education. The data collected from the respondents showed that women are more aware and interested in functional foods than the male respondents. Only 15% of the participants said that they do not know the meaning of the term “functional foods”. This study has shown that the knowledge and interest of consumers’ for the functional foods is influenced by factors such as gender, age, education or income level. The prices together with the sensorial and health benefits were among the decisive factors.

Keywords: bioactive compounds, consumers` perception, functional food, health properties

Introduction

The food industry is directing new product development towards the area of functional foods and functional food ingredients (Iwatani et al., 2019; Roberfroid et al., 2000). Although there is still no legal definition for functional foods, these are considered by the scientific community as providing additional benefits beyond the general benefits of nutrient intake and the satisfaction of hunger (Lenssen et al., 2018). The Academy of Nutrition and Dietetics (2013) tried to find a simple definition for functional foods “as whole foods along with fortified, enriched, or enhanced foods that have a potentially beneficial effect on health when consumed as part of a varied diet on a regular basis at effective levels based on significant standards of evidence” (Singh et al., 2019, Stojanovic et al., 2013 ). However, there is no regulatory definition for functional foods (ADA, 2011).

The term “functional food” was first used in Japan, in the 1980s, more exactly for food products fortified with special constituents that possess advantageous physiological effects. The first concept of functional food was promoted in 1984 by the Japanese scientists who studied the relationships between nutrition, fortification and modulation of physiological systems and sensory satisfaction (Hardy, 2000; Siro’ et al., 2008). Previous studies reported that Japanese people are known for their longevity, a well balance lifestyle, and healthy dietary habits. Nevertheless, the mortality caused by cardiovascular diseases was still high. Therefore, in 1991 the Japanese Ministry of Health introduced rules for approval of specific health related food category called FOSHU (Food for Specified Health Uses) as a regulatory system for “functional foods”, which included the specific health claims for this type of products. Shortly after the introduction of the FOSHU regulation, the
number of functional foods products increased, mainly from 1997 to 2007 (Iwatani et al., 2019).

The trend towards functional foods has led to the publication of many articles describing the effects of including foods and food components or ingredients with functional properties in various types of products which improve overall health and well-being, or reduce the risk of specific diseases (e.g. certain type of cancers, osteoporosis and cardiovascular diseases) (Fernández-Ginés et al., 2005; Kraus, 2014; Ozen et al., 2012; Vodnar et al., 2010a). Among the most popular functional ingredients are, for example, vitamins (B, C, A, D), antioxidants (e.g. lycopene, isoflavones) in fruits and vegetables, fibres in cereals, calcium in milk, minerals (calcium, magnesium, zinc, iron) or omega-3 fatty acids in fish (Kraus, 2014; Singh et al., 2019; Bordbar et al., 2011; Martirosyan et al., 2015; Siro et al., 2008; Vodnar et al., 2010b).

Over the last years, both market studies and academic research have reported the rising awareness and interest of consumers for functional foods (Urala and Lähteenmäki, 2004; Büyükkaragöz et al., 2014), highlighting several factors that can influence the consumer interest for functional foods: recognition of the role that food plays in the preservation of health and also the increase in life expectancy (Krystallis et al., 2008; Büyükkaragöz et al., 2014). Health issues such as obesity, cardiovascular diseases, age-related cognitive decline, metabolic syndrome, insulin resistance and diabetes were among the main triggers of consumers' awareness regarding the food – health relation (Siró et al., 2008). These global problems lead to an increased interest for the development of food products with additional health benefits based on their functional ingredients (Charalampopoulos et al., 2002). On the other hand, the Health Focus conducted a study reporting lower frequencies of healthy food consumption, although the importance of healthy eating was known by the participants. At the same time, the number of consumers reporting regular consumption of healthy foods has decreased in the USA, thus lowering consumers' desire to improve their diets (Gilbert, 2000). Singh (2019) reported that the "attitude" is "a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object". Other studies showed that the attitudes are usually measured by the assessment of a person's beliefs as a result of direct observation, indirect knowledge, positive or negative opinion from friends, teachers, media, or self-generated. In the same time that "belief" is formed by a number of variables like personality, mood, emotion, values, perceived risk, past behavior, age, education, race, ethnicity, sociocultural position, culture, nationality, religious affiliation, knowledge, media exposure to information, and social support (Fishbein and Ajzen, 2011; Singh et al., 2019). Schifferstein et al. (2001) reported that there are various beliefs and factors that have been reported to change the attitude towards functional foods. For functional foods same factors contributing to the formation of attitudes, can be categorized into consumer attributes and product attributes (e.g. sensory characteristics, health claim, price) (Schnettler et al., 2016; Smith et al., 2010).

**Materials and Methods**

Data were collected through a survey between April 2019 and June 2019, in which 120 Romanian consumers participated. Participants were randomly recruited by distributing the questionnaire on-line through social media networks and websites. Participants were given the questionnaire and asked to fill it in by themselves to minimize the influence of the interviewer. Participants deemed the content of the questionnaire and its items as clear and appropriate. All the answers were centralized by the research team. This study includes respondents with a wide variety of socio-demographic backgrounds.

The data collection questionnaire was made up of four sections:

(A) The first section asked about socio-demographic characteristics including sex, age, educational level, environment of origin and monthly income (Table 1).

(B) The second section comprised questions about the experience of the participant and the real understanding of the term "functional food". In this section, three questions were asked to the participants: (1) Do you know the meaning of the term "functional food? “; (2) "What does the term "functional food" means to you?”, and (3) "Have you buy functional foods before?". The second question was a free answer option question, most of the respondents saying that a functional food "is a product with health benefits".

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**Table 1**: Socio-Demographic Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>Educational Level</td>
<td></td>
</tr>
<tr>
<td>Environment of Origin</td>
<td></td>
</tr>
<tr>
<td>Monthly Income</td>
<td></td>
</tr>
</tbody>
</table>

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(C) The third section deals with the participants' consumption of functional foods. This section has four questions as follows: (1) "How much would you be willing to pay for a functional food?", (2) "Have you consumed functional products so far?" (yes/no answer); (3) participants were asked to give 1-5 examples of functional foods they consumed and the last question (4) referred to how often they consumed functional foods.

(D) The last section referred to the source and method of choosing functional foods on the market.

The aim of this questionnaire was to know the opinion of consumers on: benefits of functional foods; confidence in functional foods; necessity of functional foods; taste of functional foods; and information about functional foods. Examples of answers were: 'A functional product must be: Tasty, accessible, energizing effect'; 'Functional foods are needed by people who have specific health problems'; 'Functional foods promote my well-being'.

The questionnaire showed that the questions were well designed for the participants, and they could provide clear and useful information.

**Results and discussion**

One hundred and twenty people participated to this study: 23,1% were male and 76,9% were female. Participants ranged in age from 18 to over 50 (mean 36.4 years ±11.00 years). The most influent group was the one between 18-25 years (48.7%), followed by the group of 26-34 years (30.8%) and the group with the lowest representatives was that with respondents over 50 years (3.4%). Most of the consumers (65%) had higher education or postgraduate studies (28%) and the majority come from the urban environment (64.7%).

Regarding the term "functional food", 85.5% of total participants to this study confirmed that they knew the term. Among the most frequent answers about the meaning of this term were: "are foods products with health benefits due to the bioactive compounds that they contain ", "food that helps the digestive system to function and helps the health of the body ". Following the percentages obtained, 85.1% of the participants said they bought functional products, and the most reasonable purchase price they would be willing to give is between 2-4 € and only 15.2% of them would be willing to spend more than 4€ for a functional product.

When the participants were asked if they had consumed functional foods so far, 86.7% answered "yes" and only 13.3% of them gave a negative answer (Table 2). The most common examples of already consumed functional foods included: probiotic yogurt, protein bars, cereals, fruit, vegetables, fish, biscuits and fruit bars, fruits rich in antioxidants.

Regarding the frequency of functional foods consumption among the participants, the most selected choice was that of "once every 2-3 days". They purchase these type of food products mainly
Consumers’ Requirements for Functional Foods

Table 2. Consumers preference for functional foods

<table>
<thead>
<tr>
<th>Most consumed functional foods</th>
<th>Most common functional foods that participants would like to consume</th>
<th>Properties that from their point of view should have a functional food</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probiotic yogurt (28,3%)</td>
<td>Sugar-free fruit juices (11,7%)</td>
<td>Tasty</td>
</tr>
<tr>
<td>Fruits (22,5%)</td>
<td>Foods rich in probiotics (10%)</td>
<td>Energizing effects</td>
</tr>
<tr>
<td>Cereals (18,3%)</td>
<td>Functional vegetable bars (8,33%)</td>
<td>High nutrient supply</td>
</tr>
<tr>
<td>Protein bars/fruit bars (11,6%)</td>
<td>Chocolate with green tea (6,83%)</td>
<td>Beneficial effects for the body</td>
</tr>
<tr>
<td>Vegetables (15%)</td>
<td>Products derived from soy (6,66%)</td>
<td>Antioxidant properties</td>
</tr>
<tr>
<td>Fish (11,6%)</td>
<td>Functional drinks from vegetable extracts (4,16%)</td>
<td>Strengthening of immunity</td>
</tr>
<tr>
<td>Functional drinks (9,16%)</td>
<td></td>
<td>Accessible as a price</td>
</tr>
<tr>
<td>Functional bread (5,83%)</td>
<td></td>
<td>Minimally processed</td>
</tr>
<tr>
<td>Biscuits (5%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 1. Purchase locations for functional foods

from supermarkets (55.50%), and specialty stores (22.07%) (Figure 1).

According to the answers received from the participants to the question: “Do you consider that there is a sufficiently varied range of functional foods?” (Figure 2a-b), it can be concluded that the market does not offer a satisfactory variety of functional foods, and this aspect must be improved. On the other hand, among the most wanted foods to be found more often and in more varied ranges on the market are: functional drinks, different yogurts assortments, functional bread, probiotics enriched foods, minimally processed functional grain/fruits bars, chocolate, fortified biscuits.

Another important aspect followed in this study was to find out the opinion of consumers regarding the properties that from their point of view are essentials for a functional food. Thus, based on their answers, the utmost attributes were: taste, energizing effect, high nutrient content, beneficial effects for the body, antioxidant properties, strengthening of immunity, protection against digestive disorders and accessible price. An important aspect of functional foods that should not be overseen (due also to its weight in the consumers’ decision-making process) is the organoleptic attributes. Tuorila and Cardello (2002) reported that if the taste of functional foods is not very friendly, it decreases the likelihood of its consumption, irrespective of any persuasive claims about the advantages of its consumption.

Certain selected socio-economic and demographic factors (gender, education level, age) as well as consumers’ attitudes were found to be relevant in explaining consumers’ awareness regarding the functional foods. The results show that the female respondents were more aware of functional foods benefits than the male respondents. Taking into account the results obtained, the likelihood of respondents’ awareness of functional food was greater among those who had a higher education than among those with a lower educational level. Also, the results denoted...
that younger respondents were more aware of functional foods than older ones.

Lately, the consumer perception regarding the diet-health relation has become an important aspect of everyday life. Also, consumers are more opened to functional foods if these items are perceived healthier than the conventional alternatives. Thus, consumers need to be aware of functional foods potential health benefits including the decrease risk of diseases (Roberfroid, 2000; Menrad, 2003).

In terms of acceptance criteria for functional food, among the most important are consumers’ socio-demographic characteristics such as gender, education and age, their monthly income and also their openness to new (Urala, 2005). The scientific studies showed that female consumers are a more promising target group than men, the same result being obtained in our study. In the Buyukkaragoz et al. (2014) study, older consumers were more aware of functional foods than the younger ones, contrary to our results where younger consumers were more conscious of functional foods benefits. Another study by Childs and Poryzees (1997), showed that older consumers had less intention to buy foods that prevent diseases compared with younger consumers. Regarding age, Poulsen (1999), mentions that the relatively older participants (over 55 years), showed a greater intention to buy functional foods. Other studies, such as those of Iwatani et al. (2019), Siro´ et al. (2008), Bogue et al. (2000), showed that older consumers payed more attention to health claims such as the decreased risk of cancer. In the last years, the older people were more interested in functional foods and their health promoting proprieties but in the present time these statistics have changed. Now current studies revealed a
growing interest of younger people in healthy food, functional foods, and also in their request to see on the market a more varied range of functional products. This was also supported by the results obtained in the present questionnaire study.

In terms of socio-demographic aspects, consumers with a higher educational level and higher income bought functional products more often (Verbeke, 2005). Others authors reported considerable sociocultural differences between US and European consumers in relation to functional foods use (Jerko et al., 2015). In our study, most of the participants have higher education level, a higher monthly income level, and for that reason, a greater interest for the knowledge and consumption of functional foods such as: yogurts, functional bread, foods enriched with probiotics, minimally processed functional grain/fruit bars, chocolate, fortified biscuits. Buyukkaragoz et al., (2014) showed that consumers with a general interest in health and in new functional ingredients have a positive attitude towards functional food and perceive the foods as necessary and rewarding to consume.

Conclusions

Consumer acceptance of the functional foods concept has been recognized as key success factor for consumer-led product development, market orientation and opportunities. Therefore, there is a strong need for a proper communication of the functional products health promoting benefits, in order for the consumers to be correctly informed when they choose to purchase this type of products. Our study has shown that socio-demographic characteristics such as age, monthly income, level of education and also prices are important factors which influence consumers decision to buy and/or consume functional foods. Also, a lack of knowledge regarding functional foods concept or a misinterpretation of the term was noticed. From this point of view, it is important to educate consumers about the health benefits of functional products or functional ingredients and to encourage the consumption of functional foods through ethical and informative marketing. There is no doubt that functional foods generate one of the most promising and dynamically developing segments of food industry, requiring at the same time scientifically sound evidences of their health promoting benefits.

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