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Research Paper

IRANIAN FOOD CONSUMERS' WILLINGNESS TO SHIFT INTO A HEALTHIER LIFESTYLE BY CONSUMPTION OF FUNCTIONAL FOODS

Zahra Salehi¹, Reza Nekouian^{1*} and Fatemeh Jahanjoo Amin Abad²

*Corresponding Author: **Reza Nekouian** ✉ rnekouian@tums.ac.ir

Change in human lifestyle followed by high incidences of obesity, chronic diseases and life time expectancies as well as aging of populations were underlying reasons which posed intense demand for consumption of health promoting food products such as Functional Foods (FFs). The present descriptive questionnaire based survey was aimed to investigate. (1) if Iranian food consumers are willing to switch into a healthier diet and life style; (2) whether they turn on functional foods to make them do so; and (3) what are main underlying reasons directing their acceptance of FFs?. Results of our study showed that majority of people in our sample society were informed about the link between diet and health and kept eye on diet (rather than physical activities and consumption of supplementary pills) to improve their health state and well-being. In addition, when it came to FFs, 65% of them were FF users. While healthiness was the most important determinant of consumers' willingness to use FFs, high price and safety concerns were demonstrated as vital factors which limited their acceptance. Successful communication and provision of information was another factor effecting consumers' willingness to buy FFs.

Keywords: Functional foods, Unhealthy eating habits, Chronic diseases, Consumer acceptance of functional foods

INTRODUCTION

In our era consumer demands in the field of food production has considerably changed (Mollet and Rowland, 2002; Siró *et al.*, 2008). High incidences of chronic diseases such as coronary heart disease, diabetes and cancer (Munene, 2006) as well as aging of populations are major health concerns of today's human life (Hasler, 2002). A WHO/PAHO survey on obesity revealed an

increasing trend in obesity as countries emerge from poverty, especially in urban areas (Uauy *et al.*, 2001).

In fact, unhealthy lifestyles, particularly an unhealthy diet, physical inactivity, smoking and stress account for increased prevalence and incidence of many chronic conditions such as obesity, coronary heart disease and certain cancers (Belpomme *et al.*, 2007; Hu *et al.*, 2001;

¹ Department of Medical Biotechnology, School of Allied Medicine, Iran University of Medical Sciences (IUMS), Tehran, Iran.

² Department of Epidemiology and Biostatistics, School of Public Health, Tehran University of Medical Sciences (TUMS), Tehran, Iran.

Kromhout *et al.*, 2002; Sarrafzadegan *et al.*, 2009; Stampfer *et al.*, 2000; Zimmet *et al.*, 2001). It has been reported that lifestyle-related chronic diseases, especially coronary heart disease, heavily burden the health-care system (WHO report, 2002). Therefore, lifestyle modification is extremely important in reducing the burden of them (Sarrafzadegan *et al.*, 2009). In this context, eating habits are strongly associated with occurrence of chronic diseases, thus improving diet would help to tackle with these health conditions (Munene, 2006).

According to food as medicine philosophy, food is believed to have therapeutic benefits (Hasler, 2002). Diet and eating behavior have been known as one of the most important factors affecting individual's well-being and state of health. Consumers increasingly believe that foods contribute directly to their health (Siró *et al.*, 2008) and tend to reduce harmful material in their diet and eat healthier foods (Schmidt, 2000).

The above changes in consumer demands for food are considered in the context of food production. Today's food not only satisfy hunger and provide necessary nutrients for human but also prevent nutrition-related diseases and improve physical and mental well-being of consumers. In this regard, Functional Foods (FFs) would play a prominent role (Menrad, 2003; Roberfroid, 2000b).

The term "functional food" was first introduced in Japan, in the 1980s, for food products fortified with special constituents possessing beneficial physiological effects (Hardy, 2000; Stanton *et al.*, 2005). In 1984 the concept of FF was first promoted by Japanese scientists who studied the relationships between nutrition, sensory satisfaction, fortification and modulation of

physiological systems (Hosoya, 1998; Menrad, 2003). In general, FFs are considered as those whole, fortified, enriched or enhanced foods that provide health benefits beyond the provision of essential nutrients (e.g., vitamins and minerals). FFs can confer health benefits when consumed at efficacious levels as part of a varied diet on a regular basis (Hasler, 2002).

Advent of growing demands for consumption of FFs cannot be taken for granted owing to increase in healthcare costs, life expectancy and desire of older people for improving quality of their lives (Kotilainen *et al.*, 2006; Roberfroid, 2000a, 2000b). Considering these growing demands, food industries are enthusiastic to produce FFs to both meet the consumer demands for healthy life style and add value to business (Kleef *et al.*, 2002; McConnon *et al.*, 2002; Munene, 2006). However, production of FFs is costly and risky involving positioning and marketing challenges (Kleef *et al.*, 2002; Maynard and Franklin, 2003). On the other hand, based on expert estimations around three of four newly introduced food products are removed from market within the first two years. In the food market FF products segment is characterized with high rate of product failure (Menrad, 2001).

In fact, an effective scientific research merely does not result in a new product success in the market. It should be in suitable form to be accepted by consumers (Siró *et al.*, 2008; Van Kleef *et al.*, 2005). Acceptance of FFs would be influenced by consumers' Socio-demographic characteristics, cognitive and attitudinal factors (Siró *et al.*, 2008). Good understanding of consumers' acceptance of the concept of FFs as well as its key determinants is known to be vital for successful market orientation and

consumer-led product development (Gilbert, 2000; Verbeke, 2006). Though, it is often neglected or rarely understood by manufacturers (Verbeke, 2005).

Based on the above considerations, we decided to study the following items in Iranian food consumers: (a) peoples' beliefs about the link between diet and health, and their willingness to shift into a healthier lifestyle; (b) their food purchasing priorities; and (c) underlying reasons why they like or dislike consumption of FFs as health promoting food products.

MATERIALS AND METHODS

This study was performed as a cross-sectional questionnaire-based survey in 2013 on 235 mature Iranian food consumers who had a regular income and consequently were expected to make decisions on family eating habit styles. Designed questionnaire for this study was pretested twice for making necessary modifications and checked and confirmed by several nutritionists. The questionnaire consists of four main sections. First section contained questions about people's beliefs about the effects of nutrition on their health and tendency to improve their lifestyle and diet. The second section contains a question on people food purchasing priorities. The third part consisted of questions on consumers' perception of definition, price and availability of FFs and underlying reasons why they favor or disfavor these food products. The last section consisted of questions on participant's socio-demographic status such as age, gender, marital status, income, level of education and role in family food decision making.

Statistical analysis was performed using frequency and percentage, chi-square and

independent T-test. To define statistical significance p -value <0.05 was used. The software used was Statistical Package for Social Sciences (SPSS, Chicago, IL, USA), version 15.

RESULTS

Out of 235 survey participants, 50.9% were male (118 individuals) and 49.1% were female (114 individuals), with ages ranging from 19-78 and a mean age of 36.63 years (SD: 10.64). About 75% were married (166 individuals) and 25% were unmarried (56 individuals). Monthly income of more than half of participants (57.3%) was between 5,000,000-10,000,000 rial, and 12.8, 12.3, 9 and 8.5% of respondents gained 10,000,000 – 15,000,000, more than 20,000,000, 15,000,000 – 20,000,000 and less than 5,000,000 rial, respectively. Their highest level of education was as follows: 40% bachelor degree, 18.7% master degree, 14.3% high School graduate, 10.4% some college degree, 9.6% Ph.D. and 7% less than high school. Only 43.7% of them (101 individuals) ranked their role in family food decision making as intermediate, 42% (97 individuals) high and 14.3% (33 individuals) low.

Regarding participants' opinion on the effects of nutrition on their healthiness in first section, 80.8 % of respondents (189 individuals) strongly agreed that type of the food consumed has prominent role in increasing or decreasing risk of some diseases. Correspondingly, 76.7% of them (178 individuals) believed health promoting foods have to be frequently used during lifetime (detailed results are shown in Table 1).

Approximately 69 % of people (152 individuals) answered yes to the question "have you ever decided to switch into a healthier diet due to presence of an ill family member"?. The most

Table 1: Consumers' Belief on the Link Between Diet and Health

Statements	Answer (N/%)				
	Strongly Agreed	Somewhat Agreed	No Idea	Somewhat Disagreed	Strongly Disagreed
Type of the food consumed has prominent role in increasing or decreasing risk of some diseases.	(189/80.8%)	(37/15.8%)	(6/2.6%)	(0/0)	(2/0.9%)
Health promoting foods have to be frequently used during lifetime.	(178/76.7%)	(48/20.7%)	(3/1.3%)	(2/0.9%)	(1/0.4%)

prevalent types of diseases they suffered from were high blood pressure, hypercholesterolemia and diabetes with frequencies of 28.5% (67 individuals) for both high blood pressure and hypercholesterolemia, and 17% (40 individuals) for diabetes, respectively. About 86% of respondents (201 individuals) were willing to change their diet to improve health status of the whole family members.

In addition, 54.9% of them used conserved and prepared foods such as sandwich once or several times a month. About 34% of people in our research sample sometimes exercised and 23.2% did exercise once a day or several times a week. Approximately, 44% of them declared that they often use natural foods, fruits and vegetable and 42.6% (96 individuals) often used to avoid consumption of fatty foods (with high cholesterol). But only a few of them (4.3%) said they always use supplementary vitamin and mineral pills (detailed results are shown in Table 2).

In the second section, participants were asked to mark their main food purchasing priorities. Three most frequently chosen items were food content and quality (79.9 %), food safety and health assurance (67.9 %) and price (35%). Products taste and flavor, brand and availability were other three items less frequently selected

by 34.6% (81 individuals), 29.5% (69 individuals) and 23.4% (55 individuals) of respondents respectively.

In response to the question "what is called a functional food?" in the third section, 86.4% of volunteers (203 individuals) chose the correct answer, i.e., "functional foods are those whole, fortified, enriched or enhanced foods that provide health benefits beyond the provision of essential nutrients". In addition, 51.5% of volunteers (121 individuals) believed FFs are intermediately available in Iranian food markets and 54% of them (127 individuals) ranked price of FF products as expensive (Table 3).

In the third section the questionnaire asked "Do you consume FF products such as probiotic yogurt, milk enriched with vitamin D and bread enriched with zinc and iron?". In response to this question, 64.8% (151 individuals) answered yes and 35.2% (82 individuals) marked no. Interestingly, there was a significant correlation between respondents correct answer to definition of FF and their willingness for consumption of these products (p -value=0.004). No significant correlation was found between any of socio-demographic features of our research sample with their willingness to use FFs (p -value >0.05). In the next question, they were asked to mention

Table 2: Participants' Willingness to Change Their Lifestyle and Diet

Statements	Answers (N/%)
Switched into a healthier diet due to presence of an ill family member	Yes (152/69.1%)
	No (68/30.9%)
Different types of diseases they suffered from	Cancer (8/3.4%)
	High blood pressure (67/28.5%)
	Hypercholesterolemia (67/28.5%)
	Diabetes (40/17%)
	Fatigue (23/9.8%)
	Heart disease (22/9.4%)
	Headache (8/3.4%)
Change diet to improve health status of family	Anemia (27/11.5%)
	Yes (201/86.3%)
Using conserved and prepared foods	No (32/13.7%)
	Once or several times a day (2/0.9%)
	Once or several times a week (33/14.2%)
	Once or several times a month (129/55.4%)
Exercise	Once or several times a year (69/29.6%)
	Once a day or several times a week (54/23.2%)
	Once a week (36/15.5%)
	Sometimes (80/34.3%)
	Seldom (51/21.9%)
Using natural foods, fruits and vegetables	Never (12/5.2%)
	Always (96/40.9%)
	Often (104/44.3%)
	Sometimes (31/13.2%)
	Seldom (4/1.7%)
Avoid using high fat foods	Never (0/0)
	Always (48/21.1%)
	Often (96/42.1%)
	Sometimes (67/29.4%)
	Seldom (15/6.6%)
Using supplementary pills	Never (2/0.9%)
	Always (10/4.3%)
	Often (38/16.4%)
	Sometimes (62/26.7%)
	Seldom (64/27.6%)
	Never (58/25%)

Table 3: participants' Perception of FFs Definition, Price and Availability	
Statements	Answers (N/%)
What is called a functional food?	Foods containing additives and preservatives (14/6.2%)
	Food produced under unnatural conditions (7/3.1%)
	Foods providing health benefits beyond the provision of essential nutrients (203/90.2%)
	Partially cooked foods or foods that are prepared for cook (1/0.4%)
Participants' perception of FFs availability	Low (43/18.3%)
	Intermediate (121/51.5%)
	High (28/11.9%)
	Don't know (41/17.4%)
Participants' perception of FFs price	Low (0/0)
	Intermediate (42/17.9%)
	High (127/54%)
	Don't know (64/27.2%)

why they like to use FFs. FFs healthiness, recommendation of FFs by specialists and nutritionists and their safety and quality assurance were three main motivating factors for consumption of these products, selected by

66.5% (103 individuals) and 62.6% (97 individuals) and 29% (45 individuals) of FF consumers respectively. While, in response to the last question asking about the reasons of consumer reluctance to use FFs, people who did not use

Table 4: Underlying Reasons Why Participants' Liked or Disliked Consumption of FFs	
	Reasons (N/%)
Using FFs	Safety and quality assurance (45/29%)
	Reasonable price (13/8.4%)
	Good effects on health (103/66.5%)
	Good availability (18/11.6%)
	Good taste and flavor (30/19.4%)
	Intensive need (24/15.5%)
	Family recommendation (33/21.3%)
	Advertisement (17/11%)
Don't using FFs	Specialists/nutritionists recommendation (97/62.6%)
	Bad taste and flavor (14/13.7%)
	Expensive price (37/36.3%)
	Poor quality control and assurance (30/29.4%)
	No positive effect on health (12/11.8%)
	No need (24/23.5%)
	No information (45/43.7%)
	Poor availability (18/17.5%)
Not recommended (18/17.5%)	

FF products chose lack of information about FFs (43.3%) expensive price (36.3%) and poor quality control and assurance (29.4%) as major reasons making them resist such foods (Table 4).

DISCUSSION

Change in human lifestyle followed by high incidences of obesity, chronic diseases and life time expectancies as well as aging of populations were underlying reasons which posed intense demand for consumption of health promoting food products such as functional foods (Belpomme *et al.*, 2007; Hasler, 2002; Hu *et al.*, 2001; Munene, 2006; Kromhout *et al.*, 2002; Sarrafzadegan *et al.*, 2009; Stampfer *et al.*, 2000; Zimmet *et al.*, 2001). To our knowledge, this was one of the first descriptive surveys in Iran which aimed to investigate if Iranian food consumers are willing to switch into a healthier life style by consumption of functional foods.

Approximately, 97% of participants agreed or strongly agreed that the type of the food they consume has prominent role in increasing or decreasing risk certain diseases and health promoting foods have to be frequently used during lifetime. This shows Iranian consumers are informed about the link between nutrition and health and believe that food contribute directly to their health. Most of the participants (86%) were willing to have a healthier diet, majority of them were not frequent conserved and prepared foods users as only 35 respondents (15.1%) declared they use such foods at least once a week. Most of them (85%) said they always or often use natural foods and more than half of them (63%) always or often avoided using fatty foods. In addition, when it came to FFs, 65% of them were FF shoppers. All these results are indicative of advent of self-care phenomenon for majority of

participants of this study. It means they are taking greater responsibilities for their own health and well-being and turning on their diet to enable them to do so. This has led consumers to view "kitchen cabinet as medicine cabinet", the tendency firstly identified in 1994 as a leading trend in the food industry (Hasler, 2002; Sloan, 1994). Our results were in contrast with results published by Deloitte and Touche who found that despite stated interests for consumption of healthy food, people eat what is most convenient rather than what is most healthy (Munene, 2006).

Surprisingly, about half of the respondents were reluctant to use supplementary pills, as 25% of them said they would never use supplementary pills and 27.6% rarely took these pills. From the other point of view, in terms of physical activity and exercise more than half of them (61.4%) cannot be considered as frequent exercisers. As most of them were interested in eating natural foods, fruits and vegetables, it can be assumed that these consumers prefer to take their necessary vitamins and mineral via foods rather than supplementary pills. In fact, they are keeping eye on diet (rather than physical activities and using supplementary pills) to improve their health state and well-being. In this case consumption of FFs containing health promoting materials would be more favorable.

About 69% of participants declared they had switched into a healthier diet due to presence of an ill family member which in a previous study undertaken by Verbeke (2005) was also reported as one of important determinants of consumer acceptance of FF products. In addition, high blood pressure, hypercholesterolemia and diabetes were the most prevalent types of diseases existed in our sample society. Considering these results

it is assumed that FFs directed against the most prevalent health conditions in the society such as high blood pressure, hypercholesterolemia and diabetes would be welcomed by these consumers with open arms, as it is crucial to take consumer demands into account before introduction of new food products to market.

Food contents, safety and cost were the most important determinants directing our respondents for their food choice. Moreover, functional food shoppers selected FF healthiness, recommendation of them by specialists and nutritionists and FFs safety as the most important factors making them buy these products. These data, confirm the results of earlier studies demonstrating that belief in food healthiness is the most crucial factor effecting consumers' acceptance of FFs (Krystallis *et al.*, 2008; Siró *et al.*, 2008). In addition, selection of recommendation of specialists and nutritionists as another determinant of intention to buy FFs, reinforces the importance of trust in the source of health-related information in FFs choice demonstrated in previous studies (Urala and Lähteenmäki, 2007). This is consistent with what was reviewed by Siegrist (2008) who mentioned, when communication of the benefits of a new food technology is done through independent scientists or consumer organizations it is more likely to positively influence consumer acceptance of the new food technology.

On the other hand, majority of participants who failed to answer correctly to the question asking the definition of FFs were also reluctant to purchase FFs. These people marked lack of information about FFs as the most important factor for not purchasing these products. These results indicated the findings of previous surveys

which showed lack of knowledge was the major reason for not consuming FFs and knowledge of foods and food ingredients positively contributed to the success of FFs in the UK market (Hilliam, 1996; Verbeke, 2005). According to these results, it is fair to mention that most of people in our survey were informed about the link between diet and health, and were concerned about self-care and personal health. Thus, they are demanding for more information to make specific and selected dietary choices as consumers' dietary behavior can be markedly affected by communication and information (Verbeke, 2008). This highlights strong need for special information and communicational activities for example through medical doctors or nutritional advisers in this respect (Menrad, 2003).

About half of the participants ranked price of FF products as expensive and 34% of individuals who did not use FFs selected high price as one of key reasons making them not consume these products. As price was also regarded the third important food purchasing criteria in our sample society, we assumed that it is a key determinant of FF acceptance by consumers. Similarly, high price prima was introduced as an important factor of FFs limited market success in Europe in previous studies (Menrad, 2003; Verbeke, 2005). In addition, food safety and quality assurance was stated as another key criterion concerned by people in purchasing food products. FF poor quality control and safety were indicated as a reason why some participants disfavored FFs. Thus, perceived risk from using these new food products would negatively correlate with consumers' acceptance (Siegrist, 2008; Urala and Lähteenmäki, 2004). It is potential that safety concerns of participants who were reluctant to buy FFs originated from lack of information about

these “new comer” and subsequently neophobia, as it would slightly decrease consumers’ willingness to use FFs (Urala and Lähteenmäki, 2004).

Research conducted by Munene (2006) showed that taste and flavor of food is the most important criterion affecting consumer’s food purchasing decision which was confirmed by Gilbert (2000) who reported that almost one in two shoppers won’t give up good taste for health benefits. Yet, this criterion was not prominent in our survey as food content and quality was the major food purchasing priority mentioned.

CONCLUSION

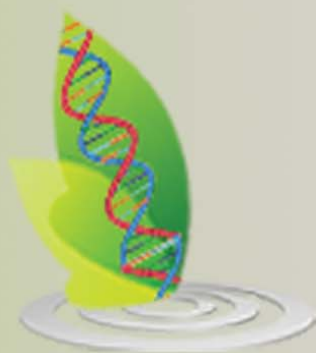
Results of this study protruded several key determinants of FFs’ acceptance in Iranian food consumers, which deserve attention to aid successful development of FFs and consequently promotion of public health. These key factors are as follows: (1) the effects of communicational activities and provision of information as consumers were demanding to get information on how to achieve better health through diet; (2) FFs’ healthiness and fruitfulness as a major motivator of consumers’ willingness to use FFs; and (3) FFs’ high price prima besides safety concerns as two underlying reasons which limited FFs’ acceptance.

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Hyderabad, INDIA. Ph: +91-09441351700, 09059645577

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