Open Access Macedonian Journal of Medical Sciences. 2013 Dec 15; 1(1):102-107.
http://dx.doi.org/10.3889/oamjms.2013.021
Public Health

Functional Foods in Macedonia: Consumers' Perspective and Public Health Policy

Igor Spiroski[1*], Dragan Gjorgjev[1], Jasna Milosevic[2], Vladimir Kendrovski[3], Daniela Naunova-Spiroska[4], Dominique Barjolle[5]

[1]Institute of Public Health of the Republic of Macedonia, Skopje, Republic of Macedonia; [2]IPSOS Strategic Marketing, Belgrade, Serbia; [3]WHO Regional Office for Europe, European Centre for Environment and Health, Bonn, Germany; [4]Avicena Diagnostica, Skopje, Republic of Macedonia; [5]Institute for Environmental Decisions IED, ETH Zürich, Zürich, Switzerland

Citation: Spiroski I, Gjorgjev D, Milosevic J, Kendrovski V, Naunova-Spiroska D, Barjolle D. Functional Foods in Macedonia: Consumers' Perspective and Public Health Policy. OA Maced J Med Sci. 2013 Dec 15; 1(1):102-107. http://dx.doi.org/10.3889/oamjms.2013.021

Key words: functional foods; attitudes; consumers; Macedonia; public health.

[*]**Correspondence:** Dr. Igor Spiroski.Institute of Public Health of the Republic of Macedonia, Department of Physiology and Monitoring of Nutrition, 50. Divizija 6, Skopje 1000, Republic of Macedonia. E-Mail: i.spiroski@iph.mk

Received: 06-May-2013; **Revised:** 18-Aug-2013; **Accepted:** 07-Sep-2013; **Online first:** 26-Sep-2013

Competing Interests: The authors have declared that no competing interests exist.

Abstract

Background: The objective of our study was to explore the knowledge, attitudes and practices of Macedonian consumers towards functional foods, to predict future trends and to assess the national public health policies encompassing the functional foods market.

Methods: Total of 518 respondents aged 18+, from all regions in the country participated in the study. They were sampled through three-staged national representative sampling procedures. The questionnaire comprised questions regarding the level of information about functional foods, trust in health claims, frequency of consumption and knowledge and attitudes related to those foods. Statistical significance was determined at $p<0.05$.

Results: Respondents aged 18-34 were more informed compared to the total population (22 and 16 % respectively, $p<0.05$). Most of the consumers consume these products once a day. Employed consumers were willing to increase daily consumption from 3 to 18 % ($p<0.05$). On average 65.1% of the statements assessing knowledge were answered correctly. On a scale from -3 to +3 functional foods were considered as very healthy (mean=2.03, SD=1.42).

Conclusion: On average, Macedonian consumers have a positive attitude and high expectations of functional foods. Public health policies still lag when compared to comprehensive approach of the food industry in market placement of these products.

Introduction

Although there is no existing unique and regulatory definition for functional foods, the scientific community agrees that those foods include a variety of foods and food components which are believed to improve overall health and well-being, reduce the risk of specific diseases, or minimize the effects of other health concerns. One of the most comprehensive definitions states that food can be regarded as functional "if it is satisfactorily demonstrated to affect beneficially one or more target functions of the body" [1]. Besides the usual foods seen as functional, like fruits and vegetables with its healthful components, breads and cereals made of whole grains, milk with its high presence of calcium in it, fortified foods and beverages, in its broadest definition, functional foods can also include dietary supplements [2]. The existing evidence continues to confirm the importance of early start of proper nutrition in order to prevent the incidence of certain conditions, primarily cardio-vascular diseases (CVD), in later life [3]. The efficacy of some ingredients in functional foods in improving the presentation of CVD risk factors has also been well established [4]. Keeping that in mind, along with the growing awareness of consumers for their health, it was expected that they would accept functional foods as inevitable part of their diet. As the world is recovering from one of the greatest economic crises in decades, the growth of the functional foods market is also driven by the needs of an ageing population, high costs of health care, advances in food innovation

presented by the media, and by expectations of higher food prices in future [5].

The functional foods concept is highly dependent on consumer understanding as well as acceptance. Furthermore, it is also dependent on products derived from its application and on the manner in which access to the marketplace is mediated by the regulatory environment at national, regional and global levels [6]. A common barrier, when considering the acceptance of functional foods by consumers, seems to be the fact that these foods are assessed on a product-by-product basis, not as a category that is operative in the context of shopping [7]. The acceptance also varies in different geographical regions, with the European consumers being more critical such that acceptance of functional foods is less unconditional, better thought-out and with considerably higher level of concern, when compared to the consumers in the US [8, 9]. Functional foods concept is commonly linked with foods with health claims [10]. Health claims on foods must be scientifically substantiated, and as such, in 2006 the European Union (EU) adopted its Regulation 1924/2006 on nutrition and health claims made on foods. The regulation states that consumers should understand the health claims. However, European Food Safety Authority (EFSA) decided that it is out of its competence to judge on consumers' ability to understand the claims [11, 12]. Consumers have understood that food has a greater impact on their health than previously assumed. That comprehension influences their behavior and potentially affects public health by shifting the attention towards food, not only as medium that will satisfy one's hunger but also as contributor to his/hers improved health. This recent nutritional shift, besides the demographic and economic changes mentioned above, has its origin in the desire for an improved quality of life [13].

Although the need for knowledge about consumers' attitudes towards functional foods is inevitable in every country, there has not been any research done or papers published on this topic in the Republic of Macedonia. The objective of our study was to explore the consumption of functional foods among Macedonian consumers, their knowledge, attitudes and practices related to these foods, as well as to predict future trends in that respect. Furthermore, we wanted to assess the national public health policies encompassing the emerging functional foods market.

Methods

The sample for this quantitative survey was chosen by randomized, three-staged national representative sampling procedures, whereas pooling stations have been defined as primary, households as secondary and the respondents as tertiary sampling units. Primary sampling units have been chosen using Probability Proportional to Size (PPS) procedure, secondary using Random Route Technique and tertiary units using Kish scheme. The 2002 census of the population, the last one conducted in the country to date, was considered as baseline for the sampling procedures. A total of 518 respondents age 18 and older, from all eight statistical regions in the country have participated in the study. Data collection took place from 15th to 30th of September 2010. The sample was dominated by respondents with completed primary and secondary education, married, with 3 to 4 household members and living in urban settlement. This distribution is in compliance with the data from the last census of the population in Macedonia [14].

Instrument

The administered questionnaire was main instrument of the study. The master version of the instrument was developed in English. It was then translated into Macedonian and translated back to English by a second translator. Two independent observers than matched the back-translated and the English version. Noted discrepancies were corrected until the back-translated version fully matched the original English one. A pilot survey, which included 10 respondents, was conducted to assess the clarity and relevance of each item. The pilot study confirmed the appropriateness of the instrument and only some minor adjustments were introduced.

The questionnaire comprised of three sections. In the first section, respondents were asked to assess their trust in health claims and also their level of information, frequency of consumption, and knowledge and attitudes they have regarding functional foods. Prior to expressing their attitudes the respondents were provided with the explanation and photography of which products are considered as functional foods and the actual meaning of health claims. Level of information about these foods was assessed by using 5 statements ranging from "not informed at all" to "fully informed". Frequency of consumption was determined by offering the respondents a choice from a range of ten frequencies that best suited their lifestyle. Offered frequencies ranged from "more than 2 times a day" to "never". Nutritional and health knowledge was determined by given answers to five true/false statements about the health effects of some micro and macro nutrients present in functional foods (e.g. "polyunsaturated fats are more likely to raise people's blood cholesterol level than saturated fat"). Seven point numeric scale (from -3 to +3 with 0 representing neutral attitude) was used to determine the attitudes of consumers about several aspects of functional foods like healthiness, taste, price, convenience for consumption etc. Five statements about health claims were used to assess consumers' trust in them (e.g. "reading food labels takes more time than I can spend"; "using food labels to choose foods is better than just relying on my own

knowledge about what is in them"). Scale ranged from 1 to 5 with 1 = "I don't agree at all" and 5 = "I completely agree". The questionnaire included separate section about demographic data. In the last section consumers participating in the study self-assessed their health status as "bad", "moderate" or "good".

Data analyses

SPSS (Statistical Package for Social Sciences, Version 18.0) was used to analyze the data gathered in the survey. Differences in socio-demographic characteristics of the consumers were cross tabulated with the level of information and frequencies of current and future consumption of functional foods. P values lower than 0.05 were considered significant. Confidence interval (CI) of 95% was used. Percent of true answers indicated the nutritional knowledge of the participants in the study. Nutritional knowledge was also cross-tabulated with the level of information. Principal component analysis of the scale of attitudes towards functional foods was conducted in order to explore its potential structure. Means and standard deviations were computed for the answers on a food labels trust scale.

Results

Socio-demographic thematic category was major influencing factor but may give incoherent picture about dietary issues related to functional foods. Nevertheless, that category should not be omitted from any research regarding these products [15, 16]. Socio-demographic characteristics of the surveyed sample are presented in Table 1.

The table demonstrates that almost equal number of men and women were included in the study as well as the presence of almost equal number of participants from every age group. The levels of information about functional foods were cross-tabulated with the socio-demographic characteristics of the respondents and their nutritional knowledge. As presented in Table 1, there was no significant difference between males and females in the sample with 23 % of women being very well and fully informed comparing to 22 % of men. Nearly one quarter of the respondents aged 18 to 34 were significantly more "very well informed" compared to the average level of information of the total sample. Opposite to that, participants aged 55 and above were significantly less informed about these products compared to the average level of information for the total sample. Only 12 % of the respondents with higher or university education were not at all or poorly informed about functional foods compared to 49 % of the respondents with completed elementary school or less. Percentages for both population groups are below and above the average respectively when compared to the total sample with significance at the 5 % level. From the other socio-demographic categories, no or poor level of information about the functional foods was significantly above the total sample average with the respondents who used to be married, live in households with up to 2 members and self-estimated their current health status as bad. Employed respondents had significantly low percentages of poor information about functional foods. Respondents living in urban settlements were better informed comparing to those in rural ones.

Table 1: Socio-demographic characteristics of the respondents, their nutritional knowledge and level of information about functional foods.

Socio-demographic characteristics	n	Not at all infor-med (%)	Poorly infor-med (%)	Mode-rately infor-med (%)	Very well infor-med (%)	Fully infor-med (%)
Total score	518	10	25	41	16	7
Gender						
Male	257	8	28	41	15	7
Female	261	12	23	41	17	6
Age						
18-34	183	4*	24	42	22**	5
35-54	183	9	24	45	13	8
54+	152	19**	28	35	12	5
Education						
Elementary or less	245	15**	34**	33*	10*	6
Secondary	208	7	20	49	20	5
Higher or university	65	1*	11*	50	25	13
Marital status						
Single, not living with partner	114	7	22	45	18	7
Cohabitating/married	369	9	26	42	15	6
Used to be married	35	28	29	23	15	5
Number of HH members						
Up to 2	113	17**	31	34	11	4
3 to 4	226	6	24	46	16	7
5+	179	10	23	39	20	7
Type of settlement						
Urban	326	9	22	43	19	5
Rural	192	12	30	39	10	8
Self-assessed health status						
Bad	44	31	34	15*	15	5
Moderate	149	10	30	40	11	7
Good	325	7	22	45	18	6
Body-mass index						
Underweight (<18.4)	13	45	25	13	3	4
Normal (18.5 - 24.9)	232	10	23	42	19	5
Overweight (25 - 29.9)	186	11	26	41	14	8
Obese (>=30)	85	4	28	45	15	8
Current occupation						
Employed	168	4*	20	45	22	7
Unemployed	350	13	28	39	13	6
Nutritional knowledge						
Total score	505	10	21	43	19	7
Participants with 1 correct answer	12	8	25	25	34	8
Participants with 2 correct answers	39	15	15	54	8	8
Participants with 3 correct answers	255	12	22	42	16	8
Participants with 4 correct answers	157	7	22	41	24	6
Participants with all 5 correct answers	42	5	17	52	21	5

* Significantly below the average (p<0.05, Chi square test); ** Significantly above the average (p<0.05, Chi square test).

We didn't find any significant difference between the self-assessed level of information and the nutritional knowledge of the respondents (p=0.06), as a measurement of subjectively assessed compared to real knowledge. Significance aside, as shown in Table 1, participants who subjectively assessed its own level of information as moderate had slightly better objective knowledge. That also counts for the participants who self-assessed themselves as very well and poorly informed. Frequency of current and future consumption of functional foods, regarding

price and availibility, was also assessed with respect to their socio-demographic characteristics (data not shown). Most of the consumers both consumed and will consume these products once a day, if they are more readily available as well as cheaper (22.1 and 29.1 % respectively). Employed respondents reported that are willing to increase their future consumption of "more than 2 times a day" from current 3 % to 18 %, which would be significantly above the average of projected future consumption of the total sample of 11.5 %. With availability circumstances improved, consumers with bad health status would have significantly higher "once in 2-3 days" consumption of 27 % comparing to the total average of 15.9 %, but the percentage of them who will never eat these products would also be higher than the average (15 %, average = 8.1 %). Older consumers, age 55 and above, were willing to increase their monthly consumption when compared to the monthly consumption of the total sample (7 % and 3.6 % respectively). There was a significantly higher percentage of future rejection among the consumers living in households with up to two members, and those who are overweight (17 and 13 % respectively), when compared to the total average of 8.1 %.

Attitudes of the consumers towards several aspects of functional foods were assessed using seven point numeric scale. Principal component analysis of that scale was conducted to explore its potential structure, as presented in Table 2.

Table 2: Attitudes towards functional foods.

	Loadings on Factor 1*	Mean (SD)**
Bad/Good	0.89	2.00 (1.29)
Unpleasant/Pleasant	0.87	1.90 (1.30)
Unhealthy/Healthy	0.86	2.03 (1.42)
Inconvenient for consumption/Convenient for consumption	0.85	1.83 (1.41)
Tasteless/Tasty	0.80	1.85 (1.43)
Cheap /Expensive	0.33	1.81 (1.48)

* Total variance explained by one factor = 62.78% (Extraction method: Principal Component Analysis); ** Scale ranged from -3 to +3.

As seen there, majority of the consumers have extremely positive attitude about all offered aspects of functional foods, except for the price, since they are currently assessed as very expensive. In our sample consumers stated that functional foods are both tasty and healthy.

Table 3: Knowledge about nutritional characteristics of foods.

Statement	% of correct answers
Vitamin A helps absorb calcium	29.1
Vitamin C fights colds and has anticancer power	95.4
Carbohydrates convert to sugar and fuel the body	81.6
Polyunsaturated fats are more likely to raise people's blood cholesterol level than saturated fat	32.1
Risk of high blood pressure is most likely to be reduced by eating a diet with less salt	87.4
Total	65.1

Nutritional knowledge of the participants in the study was, as presented in Table 3, at moderate level. On average 65.1 % of the offered statements were answered correctly. The percentage of correct answers varied from 29.1 to 95.4, suggesting that the respondents reluctantly dismissed the false statement.

Out of all participants 68 % responded that health claims on labels were helpful when making their choices, with no significant differences among any of the socio-demographic characteristics of the participants. Participants reported that the nutritional information provided by the producers on their products was reliable for them and that information provided on labels were more important than their own knowledge (Table 4).

Table 4: Using food labels and trust in them when making food choices.

Statement	Mean (SD)*
The nutrition information on food labels is hard to interpret	3.23 (1.22)
Reading food labels takes more time than I can spend	3.22 (1.24)
Reading food labels makes it easier to choose foods	3.44 (1.12)
When I use food labels. I make better food choices	3.44 (1.07)
Using food labels to choose foods is better than just relying on my own knowledge about what is in them	3.51 (1.08)

*Scale ranged from 1 to 5

Discussion

Republic of Macedonia is EU candidate country and is continuously approximating its legislation with the EU acquis. Approximation of the legal regulation related to advertisement and market use of products bearing health claims (EC Regulation No. 1924/2006) has been done in mid-May 2013, but its implementation will begin on January 1st 2014. Continuing from the period of unregulated market, through this transitional time, national market is still overloaded with foods and food products bearing nutritional and health claims which are not in accordance with the regulation that will be implemented from the beginning of 2014. Most of the brands bearing nutritional and health claims, and advertised as functional foods are imported from Western Balkans countries. They account for 45% of the national market, domestic brands participate with 19% and brands from EU countries and Switzerland share 34% of it [17].

As our results show, Macedonian consumers are continuously increasing their awareness regarding the presence of these products and have highly positive expectations in terms of the health benefits of these foods. These results are in line with the earlier research showing that health benefits were the main reason for consumption of functional foods [18] and consumers were willing to compromise on taste in favor of health but that willingness was decreasing over time [19]. Our findings showed that comparing to other age groups younger people (age 18-34) appear to be significantly more informed about functional foods. This might be due to the fact that since the presentation of these foods on Macedonian market, most of the functional foods visual characteristics (advertisements, packaging and marketing) were intended to target this age group and primarily urban population. Although no statistical significance existed in correlation between self-assessed level of

information and objective knowledge, data suggest that participants slightly under estimated their level of information about functional foods.

Macedonian consumers are willing to increase the consumption of functional foods in the future if those would be cheaper and more readily available in the stores. The level of current and future consumption appears to be above the level of daily consumption presented the study done among Italian consumers [20]. Interest and frequency of monthly consumption would significantly increase among older consumers. These findings correlate with the results from study in Switzerland about the willingness of older consumers to buy functional foods [21]. As in other surveys, our study showed that health claims are seen as useful and desirable but the extent of which they use them is still less clear [22]. The results about nutritional knowledge and attitudes towards functional foods in Macedonia are in correlation with those presented in the research done about these foods throughout the 6 countries in the region [23]. Nevertheless, we should be cautious with these findings, since it is our impression from the field work and data analyses that a real dispersion of the data for the attitudes is not present. That is, by our opinion, due to the novelty of the functional foods concept for the Macedonian consumers and their positive expectations regarding the health impact of those foods.

In May 2012 European Commission adopted the Regulation 432/2012 about the establishment of a list of permitted health claims made on foods, other than those referring to the reduction of disease risk and to children's development and health [24]. It consists of 222 functional claims which are approved by EFSA for food marketing. The regulation started to be applied on December 14th 2012, and following that date, the claims rejected from the list of authorized claims must be removed from the marketing of foods. This fact puts another burden at the yet to be completely regulated markets, such is Macedonian, and it also implies that adjustments are needed, both in regulatory and public health sectors, in order consumers to be provided with right information about functional foods present at their disposal.

Republic of Macedonia has favorable climate conditions for agricultural growth of foods that have recommended nutritious characteristics. As presented in Table 5, available WHO data shows that comparing to the average figures of the 12 countries that joined EU in 2004 and 2007, most of which transformed their economies from socialist to market oriented in about the same time with Macedonia, Macedonia has a higher average of available fruits and vegetables, similar availability of cereals and lower obesity rate. Still, there is very high rate of diseases of circulatory system present when compared to the countries of "new Europe" [25, 26].

Presented data comprises many reasons as to why regulatory bodies and public health professionals, as well as consumer associations in the country, should work together in advocating the adoption and regular updating of the EU regulations regarding functional foods. They should also raise awareness among consumers that most of the macro and micronutrients needed for maintaining healthy status of intact organism may be satisfied by balanced nutrition. This should not, in any case, underestimate the role of some functional foods for which there is scientific evidence that have had beneficial health effects for some of the health concerns related to nutrition [4, 27]. Still, it is noticeable that the public health sector response to the existing situation has been weak, if present at all, and that should be changed in the near future, especially if national authorities' intention is as such, that consumers should not to be left only under the influence of aggressive marketing of the food industry, particularly immanent for markets still not completely under the strict EU regulations.

Table 5: Comparison of some public health parameters between Macedonia and selected European countries.

Parameter	Macedonia	Average, EU members since 2004 or 2007
SDR, Diseases of circulatory system, all ages per 100000	553	420.8
Average number of calories available per person per day (kcal)	2957	3363.7
Average amounts of fruits and vegetables available per person per year (kg)	296.6	192.7
Average amounts of cereals available per person per year (kg)	129.5	155.2
Percent of total energy available from fat	33.2	31.1
Percent of obese population aged 20+	21.1	25.8

Our study is the first one dealing with functional foods in the Republic of Macedonia. It showed that functional foods concept, if well understood, has high level of acceptance among Macedonian consumers. Consumers' knowledge and attitudes, as well as the current and future trends of consumption, may be the starting point for all stakeholders in creation of their approach in the respective parts of the wide spectrum of interests, policies and actions surrounding functional foods. Further research that will include particular functional products might be beneficial in terms of more in-depth knowledge about the consumer preferences in the country.

It is also concluded that only food industry is adjusting its actions in a comprehensive manner, immanent to the regulatory environment and consumer demands in the country. Much more should be done by the Government, public health professionals, scientific community and the media. They should ensure that the public has accurate information about functional foods and they should continue to educate themselves on this emerging area of nutrition science.

Acknowledgment

This article was written in the framework of the EU research project FOCUS-BALKANS "Food Consumer Science in the Balkans: Frameworks, Protocols and Networks for a better knowledge of food behaviours" supported by the European Commission, DG Research (FP7 KBBE 2007 1, GA 212579). The authors gratefully acknowledge the financial contribution from the European Commission, under the Seventh Framework Programme for Research, Technological Development and Demonstration Activities.

References

1. Diplock AT, Aggett PJ, Ashwell M, Bornet F, Fern EB, Roberfroid MB. Scientific concepts of functional foods in Europe. Consensus document. Brit J Nutr. 1999; 81(Suppl 1):S1–S27.
2. Kapsak WR, Rahavi EB, Childs NM, White C. Functional foods: Consumer attitudes, perceptions and behaviors in a growing market. J Am Diet Assoc. 2011; 111(6):804-10.
3. van Abeelen AF, Elias SG, Bossuyt PM, Grobbee DE, van der Schouw YT, Roseboom TJ, Uiterwaal CS. Cardiovascular consequences of famine in the young. Eur Heart J. 2012; 33(4):538-45.
4. Hu FB. Do functional foods have a role in the prevention of cardiovascular disease? Circulation. 2011; 124(5):538-40.
5. Jones B. Prepared Foods Exclusive: No Functional Fad. http://www.preparedfoods.com/articles/prepared-foods-exclusive-no-functional-fad. Accessed September 6, 2010.
6. Binns N, Howlett J. Functional foods in Europe – international developments in science and health claims. Brussels: ILSI, 2008.
7. Korzen-Bohr S, O'Doherty Jensen K. Heart disease among post-menopausal women: acceptability of functional foods as a preventive measure. Appetite. 2006; 46(2):152-63.
8. Siró I, Kápolna E, Kápolna B, Lugasi A**.** Functional food. Product development, marketing and consumer acceptance - a review. Appetite. 2008; 51(3):456-67.
9. International Food Information Council. 2009 Functional Foods/Foods for Health Consumer Trending Survey. Washington, DC: IFIC, 2009.
10. Landström E. To Choose or not to Choose Functional Foods, that is the Question. Master thesis. Uppsala: Uppsala University, 2008.
11. European Parliament and the Council of the European Union. Regulation (EC) No 1924/2006 of the European Parliament and of the Council of 20 December 2006 on nutrition and health claims made on foods. Brussels: Official Journal of the European Union L 12, 2007.
12. Verhagen H, Vos E, Francl S, Heinonen M, van Loveren H. Status of nutrition and health claims in Europe. Arch Biochem Biophys. 2010; 501(1):6-15.
13. Christidis N, Tsoulfa G, Varagunam M, Babatzimopoulou M. A cross sectional study of consumer awareness of functional foods in Thessaloniki, Greece. Nutr Food Sci. 2011; 41(3):165-74.
14. State Statistical Office of the Republic of Macedonia. Census of population, households and dwellings in the Republic of Macedonia 2002. Skopje: SSA, 2005.
15. Niva M. Can we predict who adopts health-promoting foods? Users of functional foods in Finland. Scand J Food Nutr. 2006; 50(1):13-24.
16. Pothoulaki M, Chryssochoidis G. Health claims: Consumers' matters. J Funct Foods. 2009; 1(2):222-8.
17. Spiroski I, Kendrovski V, Dimitrovska M, Dimitrovska Z. Products with nutritional and health claims – consumers' attitudes and market expectations in the Republic of Macedonia. In: Proceedings of the International Symposium on Health Benefits of Foods – From Emerging Science to Innovative Products; 2011 October 5-7; Prague, Czech Republic; 2011.
18. Landström E, Hursti UK, Magnusson M. "Functional foods compensate for an unhealthy lifestyle". Some Swedish consumers' impressions and perceived need of functional foods. Appetite. 2009; 53(1):34-43.
19. Verbeke W. Functional foods: Consumer willingness to compromise on taste for health?. Food Qual Prefer. 2006; 17(1-2):126-31.
20. Annunziata A, Vecchio R. Functional foods development in the European market: A consumer perspective. J Funct Foods. 2011; 3(3):223-8.
21. Siegrist M, Stampfli N, Kastenholz H. Consumers' willingness to buy functional foods. The influence of carrier, benefit and trust. Appetite. 2008; 51(3):526-9.
22. Williams PG. Can Health Claims for Foods Help Consumers Choose Better Diets?. Curr Med Lit Clin Nutr. 2006; 15(2):25-30.
23. Zezelj I, Milosevic J, Stojanovic Z, Ognjanov G. The motivational and informational basis of attitudes toward foods with health claims. Appetite. 2012; 59 (3):960-7.
24. European Commission. Commission Regulation (EU) No 432/2012 of 16 May 2012 on establishing a list of permitted health claims made on foods, other than those referring to the reduction of disease risk and to children's development and health. Brussels: Official Journal of the European Union L 136, 2012.
25. World Health Organization Regional Office for Europe. European health for all database. http://data.euro.who.int/hfadb. Accessed December 30, 2012.
26. World Health Organization. WHO Global Health Observatory Data Repository. http://apps.who.int/gho/data. Accessed December 30, 2012.
27. Hasler CM, Brown AC. Position of the American Dietetic Association: functional foods. J Am Diet Assoc. 2009; 109(4): 735-46.