GLOBAL FOOD TRENDS – FUNCTIONAL FOODS

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Abstract

The way we approach food has been changed a lot lately. We have passed from a subsistence economy, where food was a matter of survival, to an economy of abundance, where the alimentary excesses went to an overly of so-called „diseases of the civilization:" cardio-vascular diseases (CVD), obesity, diabetes and a few types of cancer. The society is now heading to finding an optimum alimentary diet that tries to promote the consumption of the foods that have a favorable effect on the health. This is the context where appeared the concept of functional foods.

Key words: functional foods, tendencies, health

INTRODUCTION

The study of human nourishment entered quite lately in the scientific concerns, although connections between health and nutrition have been made from the early ages. If Pitagora's follower claimed that the food „is the source of every atrocity", Hipocrate will bring arguments saying that the nourishment plays a very important part in diseases preventing.

The context in which the functional foods have appeared

The way in which man feeds himself is not a constant, but it evolves and is part of a particular way of living. It depends (generally) on natural agents (geographical, climatic, geological, geo-botanicals, geo- zoological), but also on the changes that civilization and the science especially can bring.

In the last period the way the nourishment is being approached has changed significantly. It has been passed from a subsistence economy, where food was a matter of survival, to an abundance economy, where the alimentary excesses went to an overly of so-called „diseases of the civilization:" cardio-vascular diseases (CVD), obesity, diabetes and a few types of cancer. The society is now heading to finding an optimum alimentary diet that tries to promote the consumption of the foods that have a favorable effect on the health. This is the context where appeared the concept of „functional foods" [10].

In the 80s the Japanese society, consciousness of the aging process, became more and more thoughtful in preventing the diseases caused by the life-style, by every-day nourishment. This gave a pretty strong impulse to foods science and to the politics from the alimentary area ([1]. A series of projects have been initiated on this theme.

Thus the first project marks three functions of the foods:

- Regular function, of organism sustenance;
- Sensorial function, that refers to the effects that taste and smell have on the sensitive organs and also on the brain;
- The function of body-modulation (new defined) of the non-nutritional, function that is, directly or indirectly connected to diseases preventing.

The researches made over two decades had as a result a new vision on the nourishment and also on the adjoining legislation.

In 1991 the Ministry of Health and Welfare (MHW) put the basis of the first world politics that allows the legal marketing of the foods that have benefits on the health, the expression used being: „foods for specified health uses" – FOSHU [1].

The foods are being accompanied by a message or a representation (including pictures, graphics or symbolic representations, in any form) that refers to the food or a ingredient of the food and a disease/benefits that it has on the organism called „demand of health."

The foods can be declared FOSHU in the case in which every effect expected, said to contribute on maintaining the health, it is based on certain facts on the relationship between foods (compounds of the food) and health ([1].

In 1993, in the Nature magazine, was published an article called „Japan and the boundary between food and medicine". In this article it appeared for the first time, in English, the term of „functional food" [2]. The article was pointing on the researches and the results obtained by Japan. The expression was then taken by the science and as a result the concerns on the boundary between foods and health has always been a problem.

In our country the famous teacher Brad Segal has the merit to initiate the research domain, at the limit between foods science and medical science.

Most of the scientific environment, governmental and non- governmental, from the alimentary domain and the health domain, older or newly created, will focus their attention on functional foods:

- EFSA (European Food Safety Authority) – it is an European organization based on the EU budget, that operates independently from European Commission, European Parliament and the states members of the EU. EFSA (The Authority) brings scientifically proofs and the scientifically and technical support in all the areas that influence the food's safety. It is constitute like an independent source of information in all the areas from this domain and makes sure that the public is well informed.
- EUFIC (The European Food Information Council) – it is a non-profit organization that procures the scientifically information that concerns the foods security, quality, health and nutrition for mass-media, the professionals from health and nutrition, educators and the leaders of opinion.
- ILSI (International Life Sciences Institute) – it is a world non-profit foundation that tries to improve the state of good for everyone using the scientifically discoveries. Its purpose is to promote the understanding of scientifically matters that concern nutrition, foods safety, toxicology, risks evaluation and bounds science-people from the academically environment, govern and industry [14].

These organizations unrolled and unroll a large number of projects and programs in the domain of functional foods. Among this, the most important ones are the following:

- FUFOSE (Functional Food Science in Europe)– it is a program that acts on „The security of functional foods in Europe"
- PASSCLAIM (Process for the Assessment of Scientific Support for Claims on Foods) –it intends to provide to industry, the academical environment, groups of consultancy and to legislators methods to evaluate the scientifically basis for health claims.

Functional foods received a series of different *definitions*:

- A food is being considered functional if it was demonstrated that it favorable influenced one or more key-functions of the organism, next to the suitable nourishment effect, in a relevant way, by improving the state of health and of good and/or by reducing the risk of getting sick. Functional foods need to remain in the form of classical foods and needs to prove their effects in quantities that are usually used in a diet; they are not pills or capsules, but they are a part of a regular diet, this definition was adopted by FUFOSE
- Foods or ingredients of the foods that bring benefits to health, next to their fundamental role, of sustenance, for the population that consume them, including conventional foods, fortified, enriched, improved or additional foods. These one deliver essential nourishments, often above the quantities needed to a normal feeding, growth and development and/or another active biological components that brings benefits to health or the needed physiological effects (MacAulay, 2005), definition adopted by IFT (Institute of Food Technologists)

- Functional foods or foods that bring benefits to health, next to the nourishments contained, definition adopted by American Dietetic Association (ADA).
- Any food or ingredient of a food that may bring benefits to health, next to their fundamental role, of sustenance [4], definition adopted by IFIC (International Food Information Council).

From the definitions analysis we can observe that exist a common component (food/bioactive component brings benefits to health, next to their fundamental role, of sustenance), but also the next characteristic features:

- To be conventional foods, that are used in a conventional diet/ they can also be alimentary supplement as pills or capsules;
- To consider only the ingredients of the food, in the proportion found in the food/functional foods also include the enriched and fortified foods.

In this way it appeared the necessity of terminology diversification; next to the form known as the „functional foods" also being used term like: nutraceuticals, medifoods, pharmafoods, superfoods, design-foods.

In most of the countries acception, function foods are the ones that have in their structure classical foods and they can be included in a normal diet, and the nutraceuticals are concentrate forms of the active biological ingredients, usually in the form of pills or capsules.

Medifoos and pharmafoods are separated from the other groups by their propriety of being prescribed by a doctor and being used in diseases treatment.

Biologically active compounds

The researches in the functional foods are centered upon few directions:

- Biologically active compounds and their effects on health;
- The foods with beneficial effect on health;
- The influences of the different treatments on the biologically active compounds.

The biologically active compounds are chemical compounds of the food with an essential role in the good development of the human body. From this category are: proteins, fatty acids mono or polyunsaturated (PUFA), dietary fibers, vitamins, mineral salts, bioantioxidants, etc.

Some of the biologically active compounds are being enumerate in the table No. 1, also being enumerate the representativeness sources and part of their effects on the health [13].

Table No.1
Biologically active compounds found in the foods and their beneficial effects on the health

Class/Components	Source	Potential Benefit
Carotenoids		
Beta-carotene	carrots, pumpkin,sweet potato, cantaloupe carrots, pumpkin, sweet potato	neutralizes free radicals, which may damage cells
Lycopene	tomatoes and processed tomato products, watermelon, red/pink grapefruit tomatoes and processed tomato products, watermelon, red/pink grapefruit	may contribute to maintenance of prostate health may contribute to maintenance of prostate health
Dietary (functional and total) Fiber		
Beta glucan	oat bran, oatmeal, oat flour, barley, rye	may reduce risk of coronary heart disease (CHD)
Soluble fiber	psyllium seed husk, peas, beans, apples, citrus fruit psyllium seed husk, peas, beans, apples, citrus fruit	may reduce risk of CHD and some types of cancer may reduce risk of CHD and some types of cancer
Fatty Acids		

Monounsaturated fatty acids (MUFA)	tree nuts, olive oil, canola oil tree nuts, olive oil, canola oil	may reduce risk of CHD may reduce risk of CHD
Polyunsaturated fatty acids (PUFAs) -Omega-3 fatty acids - ALA	walnuts, flax walnuts, flax	may contribute to maintenance of heart health; may contribute to maintenance of mental and visual function
AGPNPUFAs—Omega-3 fatty acids—DHA/EPA **AGPNAGPN AOmega-3 fatty acids -Conjugated linoleic acid (CLA)	beef and lamb; some cheese	may contribute to maintenance of desirable body composition and healthy immune function may contribute to maintenance of desirable body composition and healthy immune function
Flavonoids		
Anthocyanins—Cyanidin, Delphinidin, Malvidin Anthocyanins -Cyanidin, Delphinidin, Malvidin	berries, cherries, red grapes	bolsters cellular antioxidant defenses; may contribute to maintenance of brain function bolsters cellular antioxidant defenses; may contribute to maintenance of brain function
Flavanols—Catechins, Epicatechins, Epigallocatechin, Procyanidins Flavanols -Catechins, picatechins, Epigallocatechin, Procyanidins	tea, cocoa, chocolate, apples, grapes tea, cocoa, chocolate, apples, grapes	may contribute to maintenance of heart health may contribute to maintenance of heart health
Proanthocyanidins	cranberries, cocoa, apples, strawberries, grapes, wine, peanuts, cinnamon	may contribute to maintenance of urinary tract health and heart health may contribute to maintenance of urinary tract health and heart health
Isothiocyanates		
Sulforaphane	cauliflower, broccoli, broccoli sprouts, cabbage, kale, horseradish cauliflower, broccoli, broccoli sprouts, cabbage, kale, horseradish	may enhance detoxification of undesirable compounds; bolsters cellular antioxidant defenses may enhance detoxification of undesirable compounds; bolsters cellular antioxidant defenses
Minerals		
Calcium	sardines, spinach, yogurt, low-fat dairy products, fortified foods and beverages	may reduce the risk of osteoporosis
Magnesium Magnesium	spinach, pumpkin seeds, whole grain breads and cereals, halibut, brazil nuts spinach, pumpkin seeds, whole grain breads and cereals, halibut, brazil nuts	may contribute to maintenance of normal muscle and nerve function, healthy immune function, and bone health
Selenium	fish, red meat, grains, garlic, liver, eggs fish, red meat, grains, garlic, liver, eggs	neutralizes free radicals, which may damage cells; may contribute to healthy immune function
Prebiotics		
Inulin, Fructo-oligosaccharides (FOS), Polydextrose	whole grains, onions, some fruits, garlic, honey, leeks, fortified foods and beverages whole grains, onions, some fruits, garlic, honey, leeks, fortified foods and beverages	may improve gastrointestinal health; may improve calcium absorption
Probiotics		
Yeast, Lactobacilli, Bifidobacteria, and other specific strains of	certain yogurts and other cultured dairy and non-dairy applications	may improve gastrointestinal health and systemic immunity; benefits are strain-specific

beneficial bacteria		
Phytoestrogens		
Isoflavones—Daidzein, Genistein Isoflavones -Daidzein, Genistein	soybeans and soy-based foods	may contribute to maintenance of bone health, healthy brain and immune function; for women, may contribute to maintenance of menopausal health may contribute to maintenance of bone health, healthy brain and immune function; for women, may contribute to maintenance of menopausal health

Tendencies in the American nourishment

A hierarchy of the natural needs compared to the incomes evolution is based on the subsistence requirements and also on the satisfaction of the ultimate needs; it beguiles in the area of luxury products and goes to the area of the products needed to improve the state of health. By making an analysis of the most successful makers in the foods/drinks area, (Top 10 food / Beverage Pacesetters"), that was elaborated based on the sales level, Elisabeth Sloan (CEO of the Sloan Trends & Solutions, Inc, editor Food Technology Magazine and North American Columnist, Functional Foods Magazine - U.K) finds on top of the list products that conquered the market by their „functional" character.

No matter if we follow diseases prevention, improve performances, the promotion of the state of good; it can be observed that the sales have improved for the products that promote the benefits for health. Functional foods become pretty fast a part of the contemporary life. The values of sales for functional foods based on the principle of nutritional demand for the year 2007 are being presented in the table no. 2 [6].

Table no 2
The value of sales for functional foods based on the principle of nutritional

Nutritional claim	Increase percentagePercentual increase	The value of sales for 2007 (bil. $)
Low fat	1	14
Fat-free	2	9,5
Absent from a specific type of fat	38	8
Reduced-calorie	6	11
No sugar	6	3
No salt/sodium	1	4

On the top of the American tendencies made at the end of 2008 by Elisabeth Sloan we can find the next bench-marks [11]:

1. *Healthy Household Halo*: Despite the fact that many Americans are cooking at eating at home, 57% of shoppers are making *a lot of effort* to eat healthier.

2. *Natural End Benefits.* Nine out of 10 consumers have long felt it important to eat foods that are naturally good sources of nutrients vs taking dietary supplements or eating fortified foods.

3. *Balancing the 'Bul-get'* The U.S. weight loss market is undergoing. To use low-carb foods, reducing portion sizes, products of low fat associate with physical exercises.

4. *Contemporary Conditions.* The aged-man Americans are being affected by CHD, cancer, high level of cholesterol, blood pressure, osteoporosis, diabetes, etc. For this segment of population are thought a series of products with increased value of polyphenols and flavanols, peptides and gamma-aminobutyric acid (GABA) for blood pressure, and plant sterols for cho-lesterol management, products with omega-3.

5. *Proactive Lifestyles* With the majority of consumers trying to live a preventive lifestyle, functional foods and

fortified beverages have quickly become a way of life. Vitamin C topped the list of nutrients consumers, followed by calcium, B vitamins, fiber, antioxidants, vitamin E, omega-3s/DHA/fish oil, vitamin A, omega-3s, potassium, iron, and folic acid, beta-carotene, phytochemicals, amino acids, and probiotics. The consumers are trying to eliminate from their nourishment the elements that are being bad for their health:

- Seven out of 10 consumers tried to limit trans fat, animal fat, and saturated fat in their diet [4];
- 45% are looking for foods with low level of sodium;
- 45% are checking the calories level;
- 42% checked sugar level [3].

Also, to give importance on food products that enhance skin, hair, and nails from the inside out are another exciting market.

6. *Simpler, Greener, and Cleaner*. Many consumers are taking a simpler, more-natural approach to the foods they eat, looking for foods with only a few ingredients and as fresh and close to the farm as time and budget will allow. On the top of their preferences remain „natural" and „organic" foods. Based on this criteria people choose fruits, vegetables, cereals, milk, meat and fish.

7. *Smart Treats*. The record between traditional snacks and healthy snack sold on the American market is 1:3. This record was obtained by eliminating part of trans fat, low-fat, whole-grain and use of whole-meal. Also grow the chips market, "better for you", followed by products based on rice, popcorn, yogurt [8]. Best evolution was made by deep-frozen and drying fruits and also fruit-made chips [5].

8. *Sensitivity Training*. The number of adults who perceive that they, or their children, suffer from food allergies, intolerances. 20% of U.S. adults say they have a food "sensitivity;" 28% of parents report their child is afflicted [7]. For this population they obtained products from probiotics bacterium (milk), fibers, probiotic, foods for the decrease of the acidity (tomato juice, spaghetti souce, juice, soup). Also a special attention is being offered for kids, aged people, but also to the people with intolerance for lactose or gluten.

9. *Vitality Treadmill* Energy was the top reason consumers made a dietary change. While few adults are consuming energy products, young people are choosing this products more and more. On the top there are energy-drinks, vitality beverages. The consumers are also interested in buying products that increase performance and mental performance [4]. Ginseng, guarana, and taurine are among the key ingredients. Candies, gums, and chocolate also gained in popularity. Improving cognitive ability in children and teens is another fast-growing market. Omega-3s, DHA, choline, B vitamins, minerals, and taurine are frequently used ingredients. For sleep problems the food market is full with products with high level of containing melatonin and GABA. Teas for calming and stress are another opportunity on the functional food market.

10. *New Venues*. Convenience stores have become a powerhouse for sales of some healthy products. Statistics say that compared to 2007, in 2008 sales for combined salads grow with 59%, chicken (NRA, 2008). Also 18% of the Quality System Regulation (QSR) operators plan to add more healthy items in the new year [9]. Low-fat, low-carb, gluten-free, light, organic, trans fat-free, natural, healthy, and low-calorie, vegetarian and vegan are the top 10 health claims on menus [8].

Trends of functional foods market

A analyze of market food effectuate in 2008 from experts in domain and who are benefit by information provide with An analysis made in 2008 by experts from the domain and that were able to use official dates provided by Datamonitor USA New York; Business Insights Ltd., Londra; Innova Market Insights, Duiven, Netherlands; International Food Information Council, Washington and Mintel International Group Ltd., Chicago came to the conclusion that most of the products have a constant quota on the market, most obvious exception being made by foods and drinks with benefits for health [12].

For the American market, Datamonitor makes an analysis of the sales for functional foods and drinks, based on their main claims

for health. A synthesis of the results obtained is being presented in the table No 3.

Table No. 3
The value of sales for functional foods based on the main claims for health

Benefit for health	2004 (mil. $)	2009 (mil. $)	CAGR* 2004-2009 (%)
Bones health	3096	3927	4,9
Hearth health	4126	5609	6,3
Stomach health	445	858	14
Energy	6502	8748	6,1
Others	4729	5756	4

*CAGR - Compound Annual Growth Rate

o *Products for hearth health.* According to the research made by Datamonitor, almost 25% of the population over 40 years suffers from hearth diseases. This fact reflects on a high level of stress, obesity, and inadequate diet. The ingredients that beneficially influence the hearth health (anthocyanins, antioxidants, carotenoids like carotene, lycopene, lutein, zeaxanthin, isoflavons, fatty acids, phytosterols, Omega-3, Q10 coenzyme) are used in snakes, baked products, dairy-produce, oils, tea and other drinks, soybean products, etc.

o *Products for bones health and against arthritis.* Earth's population is in a continue process of ageing. Typical problems for aged people are the one of bones and arthritis. In a Datamonitor report it is being showed that the number of people with bones diseases grown with 1% a year in Europe and with more than 2% in USA between 1994 and 2004. Calcium and vitamin D are the typical ingredients associated with bones health. Recent studies indicate the beneficial effect on the heart health, but also protection ingredients against cancer; this is why people try to introduce them (especially calcium) in as many products as possible, especially in drinks: soybean milk, orange juice, water, refreshments.

o *Products for stomach health*. The number of consumers suffering from serious medical conditions affecting the gut and bowel is low. The products for this consumer are various: gluten-free products, probiotics products (specifically probiotic yogurts).

o *Products for* According to World Health Organization (WHO), the obesity reached epidemical proportion in an aggregate level, with more than a billion adults being overweighed and more than 300 millions being obese, clinically speaking. The obesity is also dangerous because it favors other diseases: BCV, diabetes, bones diseases, cholesterol growth. Consumers are being aware of the risks, and as a result, the market destined to this kind of peoples is growing with more than 3,5% a year. This diets do not necessarily contain functional foods, but mostly low energetically value, with low content of fat. There are two tendencies of development for this group of products: "light" products and products with "negative caloric value." This second group mostly influence the metabolism using stimulating, like: coffin, guarana, ginseng, herba mate (that are using more calories than the product itself) and action in soothing the appetite; this products are mostly found as drinks. A large number of products from this category are being destined to overweighed children, because these ones are the most exposed to multiple diseases. In order to adjust the weight, in 2001 it was being recommended appetizers, cereals, refreshments, using attractive colors and packs with cartoons destined to attracts the smallest from the consumers. In our days people are focusing mostly on consuming fruits and vegetables.

o *Products for immunity and against aging*. They are being reached in antioxidants. Leaders of sales in this category are cooling drink, appetizer, dairy-produce, whole meal [12].

Another approach of the tendencies can be realized from the perspective of hierarchy sales on the functional foods market from the

last period of certain types of alimentary products.

In this way the consume of functional foods has been extended in the last period from the ones being consumed on a daily basis (bread, milk, fruits) to the ones consumed mostly for pleasure: sweets, pastry products, snacks, dairy-produce.

The level of development for the country and the education also influence in a decisive way the way people feed themselves and can also straighten the populations to a healthy diet, making campaigns against the obesity, smoke, excessively use of sugar, salt and fats.

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