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METHODOLOGICAL APPROACHES TO THE FORMATION OF CATEGORICAL APPARATUS IN THE SPHERE OF PRODUCTION OF FOOD PRODUCTS

In this paper issues, related to modern typing of food products, are discussed and the necessity of giving clear definition for basic types of modern food products is justified. Current approaches to classification of food products are systematizing and a new one, modern classification is created.

Keywords: *modern food products, environmental, functional, genetically modified, health food, bio, ballast simulation, organic.*

Statement of the problem. *Providing the population with high-quality and high-grade variety of food products is one of the most important social and economic problems, which is closely connected to the development of advanced methods of forming the product portfolio of businesses, which take into account the latest achievements of basic and applied researches.*

Analysis of recent researches and publications. *Common questions of companies product portfolio forming are opened in researches of E. Holubkov, R. Brodli, A. Shafalyuk , Ye. Mochernyy and other scientists.*

For ensuring successful formation of the product portfolio the food industry enterprises should take into account the important factors such as the current requirements imposed on manufacturing of food products and standardization of these products. Thus, the basic requirements that apply to all types of food products are:

- safety and usefulness for consumers health;

- quality, in accordance with approved standards;

- customer satisfaction by properties of the product.

These requirements must conform to the manufacturing of absolutely all kinds of food products, but they should be specified depending on the place of the product in the appropriate classification. At the moment there are a lot of such classifications, as well as on the producer and consumer levels, as on the level of academics. This phenomenon is absolutely justified in the condition of constant change of challenges on the market.

Formation of main goals. *In this paper we propose a new way of organizing of current approaches to classification of food products and make a clear, reasonable, modern classification, which is necessary for ensuring of compliance with the established requirements for the food products and facilitate of communication process and mutual understanding between producers and consumers of these products.*

Main part. *Today, food products are divided into several large groups. Such allocation resulted of objective circumstances, which include the evolution of technology and processing of food production, economic, demographic and physiological characteristics and needs of a diverse population, and the quality and amount of raw materials. Classification of types of modern food offered by the author, are given in table 1.*

But submitted in this classification types of food products is only partially determined by domestic law, and in part is debatable in terms of terminology and essential concept, or even encountered in everyday life and are used without adequate scientific justification [1]. The risk of uncertainty of these concepts allows producers to manipulate the consciousness of *consumers, taking advantage of their non acquaintance of the issues. The definitions of these types of food products are shown below.*

Table 1

Classification of modern food зкщвгсеі by types

<table>
<tr><td colspan="8">Modern food products</td></tr>
<tr><td colspan="5">ecological</td><td colspan="2">outdated nutrition philosophy</td><td rowspan="4">genetically modified</td></tr>
<tr><td colspan="2">health nutrition</td><td colspan="3">functional</td><td rowspan="3">ballast</td><td rowspan="3">simulation</td></tr>
<tr><td rowspan="2">organic</td><td rowspan="2">natural</td><td rowspan="2">prophyla ctic treatment</td><td colspan="2">enriched</td></tr>
<tr><td>for specific populations</td><td>Bio Products</td></tr>
</table>

Source: compiled by the author.

In 2002, Ukraine acceded to the Cartagena Protocol on Bio-safety and the Convention on Biological Diversity (Law of Ukraine on 12.09.2002 № 152 -IV). Cartagena Protocol is an international agreement, which purpose is to protect biological diversity of nature from the potential risks, which arises in the process of using modern technologies.

The adopted law was the first law on GMOs in Ukraine, which obliged our country to take on a number of obligations as to transportation, handling and using of "living modified organisms", obtained by genetic engineering.

According to the Law of Ukraine "On State Bio-safety System in the process of creating, testing, transportation and using of genetically modified organisms" we knows, that genetically modified products are products, including food products and feed, production technology of which involves using of GMOs at any stage [2].

"Genetically modified organism, a living modified organism (GMO) is any organism, in which the genetic material has been altered using techniques of artificial transfer of genes, that do not occur in vivo, such as:

- recombinant techniques involving the formation of new combinations of genetic material by introducing nucleic acid molecules (produced in any manner outside the body) into any virus, bacterial plasmid or other vector system and their inclusion into the host organism, in which they are usually not occur, but are capable for long-term breeding;

- methods, that involve direct injection of hereditary materials, prepared outside the organism, including macro – injection and micro - injection;

- cell fusion (including fusion of protoplasm) or hybridization techniques, when alive cells with new combinations of genetic material are formed through the merger of two or more cells in a manner, that is not realized due to natural circumstances " [2].

In May 13, 2009 the Cabinet of Ministers of Ukraine adopted a resolution № 468 "On approval of the labeling of food products containing GMOs or that are made from their using and put into circulation". This resolution allowed the Ukrainian consumers receive an accurate information not only about the product but also the presence or absence in a product of genetically modified components [3].

From July 1, 2009 in Ukraine all products, which have in stock GMOs or were produced using GMOs require mandatory labeling, if the GMO content exceeds 0.9 %. If there is no GMO in the product, or its content is less than 0.9 % it is possible to use label "Without GMO", but this information is necessarily checked by the State consumption standard organization.

If we look at the controversy surrounding the presence of GMOs in food products and crops, we can see that, first of all, they touch on one side the question of human conscious choice to use such products or not, and on the other - a responsible attitude to the manufacturers labeling, intellectual property rights and ethics. Also controversial is the issue of food security in the light of environmental protection. Today, in the world safety or harmful influence of genetically modified food products on human health has not decided definitely. Even opponents of GMOs agree with the fact, that using GMO is the only one way to rid the world of hunger, but keep in mind that the potential harm of GMOs is clearly underestimated.

Genetically modified food products have both advantages and disadvantages. Among the advantages there are following:

- to decrease the ripening plants, improving the taste and quality of harvest, increases nutrient content and resistance to pests, herbicides and viruses, the ability to survive in extreme weather conditions;

- health improving, virus resistance, increase in body weight, faster growth, improving of the quality of meat, eggs and milk for animals;

- for environmental protection of air, water, soil, natural recycling;

- to the population - improving of food security.

Among the disadvantages there are following:

- unknown influence of several factors on human health and environment;

- increasing dependence of developing countries from industrialized countries;

- biopiracy;

- dangerous results by mixing genes among species;

- not mandatory labeling in in some countries (for example the USA);

- label is meaningless, if GM crops are mixed with organic products.

В свою чергу продукти оздоровчого харчування поділяються на: органічні та натуральні.

The term "ecological product" is not legally defined in Ukraine. So today this definition is used as a synonym for "organic product", because in EU countries designation "bio" or "eco" is a label of organic products .

According to the authors researches, eko-product (EP) is a product, that does not contain genetically modified organisms (or ingredients, which were obtained from using GMO), consistent with environmental legislation and for its production were used eco-materials, eco-ingredients and eco-tehnologies.

According to the composition and method of manufacturing, ecological products can be divided into such as health nutrition products and functional products.

Products for health nutrition, in the author's opinion, are products that meet the needs of the human body with essential nutrient, with energy value, corresponding to energy costs, increases efficiency of the organism and its adaptation to the environment, the chemical composition of which satisfy physiological needs and provides optimal physical and mental development of the organism. In turn, products for health nutrition are divided into such as organic and natural.

As stated in the Law of Ukraine on organic production, organic products are products obtained from certified organic production, in accordance with the organic production rules [4].

Products and raw materials can be called organic, if they are produced in special areas of land, that allotment for organic agricultural production; which has a plant or animal origin. Fish -, bee - and timber products, has to be grown, produced , processed, certified, labeled, stored and marketed according to organic production rules [4].

Products are organic, if they are made in an ecologically safe environment without using of synthetic drugs (inorganic fertilizers, pesticides, herbicides, insecticides, antibiotics, hormones, etc.), genetically modified organisms, radiation, and are made without chemically synthesized preservatives, flavors, stabilizers and thickeners [5].

We can say that the organic product is primarily organic way of its producing.

Organic products are such food products for the production of which should be complied such criterias:

- during three years (at least) before the organic production the land plowing, should be made without using of chemical fertilizers;

- in crop nitrogen and other chemical fertilizers, pesticides, herbicides, insecticides, fertilizers synthetic origin are prohibited. Protection of plants is making with using of natural microbiological preparations, vegetable or animal origin. For the soil feeding and plants feeding should be using organic fertilizers, or reach it by using different rotation;

- for pest control should be applied physical barriers, noise, ultrasound, light traps, special temperature control , etc.;

- seed used in organic production must not to be genetically modified, adapted to local conditions and resistant to pests;

- using of genetically modified organisms and derived products absolutely prohibited;

- it is not allowed to feed animals with inorganic feeds, use growth stimulants, hormones and antibiotics. For the treatment of animals prophylactics and homeopathic remedies should be using. Animals should be kept in conditions close to natural, such as free access to the sun and fresh air;

- farmers should register any treatment of animals. Notes about treatment are audited annually by certifying bodies;

- when raw materials are processing for organic food products, at first, material should be organic (to meet all the above requirements), and secondly hazardous technologies refining, deodorization, flavoring, chemical preservation, processing phenols, hydrogenation, X-ray processing, introduction to product of vitamins, micro and macro elements is not permitted. The introduction of food supplements is also significantly limited. And even permitted supplements can be used only if the manufacturer can prove that without them it is impossible to produce a product or store it. [6]

When the process of transformation to the organic production stars, first three years products have not considered as organic, they will be called as products of transition. And only after three years, when on the lands above mentioned requirements were applied, products can be called organic.

As to the labeling of organic products in Ukraine, according to the law of organic products for labeling the appropriate state logo is used. This logo consists of such writing as "organic product" and the corresponding graphic representation or symbol. Using of state standard pattern logo and labeling of organic products are made according to the corresponding certificate. Organic products imported from other countries, manufactured in *accordance with the laws of their countries of origin, which services, labeled as "organic", " biodynamic", " biological", "ecological", words with the prefix "bio", etc. and has a corresponding graphic symbol, has translated into Ukrainian and labeled as "organic product" [4].*

Natural products are subgroup products for health nutrition. According to the author thoughts, natural are products that are eaten in their natural state, or the production of which does not use genetically modified organisms and synthetic additives and compounds that mimic natural.

Functional food products are another subgroup of eco-products. The law of the EU countries provides the following definition: "Functional food products are any modified food product or food ingredient that may positively affect on human health, besides the impact of the traditional nutrients it contains" [7].

So, food products can be called functional, if they sent a positive impact on the health and well-being, greater than the impact of traditional foods, and reduce the risk of any disease and these potions are declared on the package. They combine high taste with a positive impact on health by modifying the composition and adding positive functional qualities. This modification of the product by using different ratios of ingredients and inclusion in the composition of biologically active additives (BAA) makes it possible to obtain a product with the desired properties.

Biologically active additives are natural flavorings or concentrates of biologically active substances intended to enrich the diet of human. They are not food products [8].

Food products can be called functional, if they include one or more components of the 12 conventional classes of compounds, such as dietary fiber, oligosaccharide, polyunsaturated fatty acids, amino acids, proteins, alkaloids, isoprene and vitamins, cholines, lactic acid bacteria, minerals, antioxidants, nutraceuticals [8].

In modern genetics and biotechnology, scheme of functional food products is developed, as well as the basic requirements and recommendations for their creation. These guidelines indicate that the development and creation of functional food products based on consideration of medical and biological requirements for the production of such products, as well as a prerequisite of their creation is to develop recommendations for using such products or clinical testing.

Also to those recommendations, can be added following:

- orientation of functional food products and selection of bases and additives for the production of functional food products must be clearly justified;

- the study of the adverse effects (direct and incidental), and possible allergic effects of additives;

- prior process of modeling formulations and production technology (with optional perfecting technological parameters) of the product that is being developed requires;

- the study of quantitative and qualitative indicators of the product;

- development of regulations on the production and using of functional foods;

- certification and production of an experimental batch of products [8].

Functional foods can be divided into the following categories:

- products that contain a significant amount of natural physiological functional ingredient or group;

- products in which technologically reduced or removed from the content components that are harmful to health, or which prevent the display of the physiological effect of functional ingredients that make up the product;

- food products that are fortified with additional functional ingredients with a variety of processing methods [8]

Therapeutic and prophylactic products, it is also functional products, but with a clear differentiation of respect to certain factors, which have influence on the human body. If functional products do not have therapeutic purpose and may be used by consumers without any medical appointments, then therapeutic and prophylactic products should be used by consumer preferably on the basis of clear medical indications of a particular disease or a particular need for its prevention. They are not only increase the body's defenses, but also has a specific orientation activities as their composition includes specific components that restore the balance of bioactive substances, neutralize pollutants and improve the function of damaged organs and systems. Their development is either based on existing products with including the recipe ingredients targeting, or replacement components for other products. One of the options may be developing a completely new product with its recipe and production technology.

There is no definition of Therapeutic and prophylactic products in Ukrainian legislation. They are referred only in the Law of Ukraine on the protection of labor, but not specified in the article "definition of terms and concepts ".

Functional also includes fortified food products, which in contrast to functional includes vitamins, minerals, probiotic microorganisms (beneficial bacteria) and prebiotics (food for them), but there are not biologically active additives. Content of enriched or fortified product components is calculated in accordance with the average daily human needs.

To fortified food products we can include products, sold on supermarket shelves with the prefix "bio". The term "bio products" is also not legally regulated in Ukraine, and also used by consumers and producers, as a synonym for "organic product ", although such products by the method of production are related to the functional.

The author believes that "bio products" are fortified food products, which have some kind of "conditionally beneficial" microorganisms (probiotics).

There is also a group of fortified food products, which are designed for a specific segment of consumers. This specific consumer group includes children, athletes, the elderly, etc.

Products of "outdated nutrition philosophy" are consisting of "ballast", simulation and products with specific recommendations to limit consumption. They have less customer value than environmental, but also tend to lower price that attract consumers contrary to common sense and the recommendations of experts.

"Ballast" - are products of consumer, value of which is only in reproducing the energy needs of the body, and which do not bring additional benefit.

Simulation products and other food products with specific recommendations to limit consumption is a subgroup of products of "obsolete nutrition philosophy" group that have specific restrictions to consumption, which caused by age consumers, health status, and frequency of consumption and so on. These products include the popular food products (eg sugary, carbonated soft drinks, margarine, spreads, sweets, cheese products and other products that are more or less mimic dairy, fish and meat products, chocolate, honey, fish eggs etc.). These products are produced and imported in accordance with the laws of Ukraine.

***Conclusions and prospects for further researches.** Thus, proposed in the article classification of modern food products and created on its base categories allow a clear understanding of exactly how and by what types of food products the product portfolio should be improved. But it should be noted that regardless of affiliation to any type of food products all of them are made up of food ingredients. Therefore, it is important to consider not only the* *classification of the products themselves, but also their composition, which explains this classification.*

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