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Methodological Approaches to Creating Healthy Food Products

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Abstract

The substantiation of the necessity of creating healthy food products and their classification are given. Methodological approaches to the creation of healthy food products: fortified, functional and specialized purposes have been formulated.

Keywords: *Methodology; Healthy Food Products; Functional Food Ingredients; Biologically Active Additives*

Introduction

A healthy diet is the most important factor on which the health and well-being of a person depends crucially.

Nutrition plays a leading role in ensuring the normal growth and development of the body, protecting it from diseases and harmful effects of the environment.

The priority tasks of the state policy of the Russian Federation in the field of healthy nutrition are to increase production and expand the range of food products enriched with functional ingredients, specialized food products, functional products, including food in organized groups, and biologically active food supplements [13]. Considering this, one of the main components of a healthy diet is the presence of a wide range of these food products and dietary supplements.

However, the creation of healthy food products is not possible without the inclusion of functional food ingredients in their composition.

Functional ingredients are physiologically active, valuable and safe for health ingredients with known physicochemical characteristics, for which properties useful for maintaining and improving health have been identified and scientifically substantiated, as well as a daily physiological requirement has been established [4,12].

Functional food ingredients include soluble and insoluble dietary fiber, vitamins, minerals, fats and substances accompanying fats (polyunsaturated fatty acids, plant sterols, conjugated isomers of linolenic acid, phospholipids, sphingolipids, etc.), polysaccharides, secondary plant compounds (flavonoids, carotenoids, lycopene, etc.), probiotics, prebiotics and synbiotics [3].

In accordance with GOST R 54059-2010 [4], functional food ingredients are living organisms, a substance or a complex of substances of animal, plant, microbiological, mineral origin or identical to natural ones, which are part of a functional food product in an amount of at least 15% of the daily physiological needs per serving of the product, with the ability to provide a scientifically substantiated and confirmed effect on one or more physiological functions, metabolic processes in the human body with the systematic use of a functional food product containing them.

Currently, healthy food products are classified into functional, specialized and fortified [1,2,9-11,15,16].

A functional food product is a product intended for systematic consumption in the diet of all age groups of a healthy population, which has scientifically substantiated and proven properties, reduces the risk of developing diseases associated with nutrition, prevents deficiency or replenishes nutritional deficiencies in the human body, preserves and improves health due to the presence of functional food ingredients in its composition [3,6].

A specialized food product is a product for which requirements have been established for the content and (or) the ratio of individual substances or all substances and components and (or) the content and (or) the ratio of individual substances has been changed with respect to their natural content in such food product, and (or) the composition includes not initially present substances or components (except for food additives and flavorings), and (or) the manufacturer declares their medicinal and (or) prophylactic properties and which are intended for the safe use of this food product by certain categories of people [17].

Specialized food products include [17]:

- Food products of dietary medical nutrition;
- Food products of dietary preventive nutrition;
- Food products for baby food;
- Food products for the nutrition of athletes.

Dietary therapeutic food products are products with a given nutritional and energy value, physical and organoleptic properties and are intended for use as part of therapeutic diets.

Dietary preventive food products are products intended for the correction of carbohydrate, fat, protein, vitamin and other types of metabolism, in which the content and (or) the ratio of individual substances relative to their natural content is changed and (or) which are not initially present substances or components, as well as food products, designed to reduce the risk of developing diseases.

Baby food products are products intended for baby food (for young children from 0 to 3 years old, preschool children from 3 to 6 years old, school children from 6 years old and older) that meet the corresponding physiological needs of the child's body and do not causing harm to the health of a child of the appropriate age.

Food products for athletes are products of a given chemical composition, increased nutritional value and (or) targeted efficiency, consisting of a complex of products or represented by their separate types, which have a specific effect on increasing the adaptive capabilities of a person to physical and neuro-emotional stress.

Fortified foods occupy a special place among healthy food products.

In accordance with TR CU 021/2011, fortified food products are products in which one or more food and (or) biologically active substances and (or) probiotic microorganisms are added, which are not initially present or present in insufficient quantities or lost in production (manufacturing) process; at the same time, the manufacturer's guaranteed content of each food or biologically active substance used for enrichment has been brought to a level that meets the criteria for food products - a food source or other distinctive features of a food product, and the maximum level of food and (or) biologically active substances in such products should not exceed the safe upper level of consumption of such substances when coming from all possible sources (if any) [17].

The main food products recommended for fortification include flour, bakery and pasta, dairy products, beverages, as well as food products intended for the nutrition of certain groups of the population [7,8,14].

In accordance with SanPiN 2.3.2.2804-10 [14], it is recommended to use vitamins and (or) minerals for food fortification.

However, in our opinion, in order to create healthy food products, it is necessary to use biologically active additives containing not only vitamins and minerals, but also a wider range of functional ingredients that will provide a more effective positive physiological effect on the human body due to the normalization of nutritional status.

The most promising methodology in the field of creating healthy food products, which is based on an integrated approach, is the methodology developed by scientists of the Department of Technology of Bakery, Pasta and Confectionery Production of the Moscow State University of Technology and Management. K.G. Razumovsky under the guidance of Doctor of Technical Sciences, Professor T.B. Tsyganova [19].

We have proposed a more detailed comprehensive approach to the creation of healthy food products, which includes 7 main stages and provides for the implementation of several specific sub-stages at each stage.

The first stage is the scientific substantiation of the choice of the base product - the main object for creating a healthy food product. This stage includes the following sub-stages:

- Marketing research of consumer motivations and preferences when choosing a food product, taking into account the age groups of consumers;
- On the basis of marketing research, the rationale for the choice of a specific basic food product and the purpose of its development: for which segment of consumers it is being developed;
- Determination of the composition and content of functional ingredients (biologically active substances) in the base product in order to identify the deficiency in its composition of certain functional ingredients (biologically active substances) in order to replenish the deficiency of ingredients in the developed healthy food product.

The second stage - the scientific substantiation of the choice of functional ingredients or biologically active substances (biologically active additives) includes the following sub-stages:

- Substantiation and development of requirements for biologically active additives, depending on the specific type of food product being created, including the requirements: for quality and safety; to the composition and content of functional ingredients or biologically active substances contained in the supplement; to the manifestation of physiologically functional properties; to the manifestation of technologically functional properties; affordability from an economic point of view;
- Research of the used biologically active additive for its compliance with the specified requirements;
- Identification of functional ingredients or biologically active substances contained in the additive that, when introduced into the product being developed, can satisfy the daily requirement for functional ingredients (biologically active substances) when the product is consumed more than 10% of the adequate norm recommended by MR 2.3.1.2432-08 [18].

The third stage is the substantiation of the effective dosage of functional ingredients or biologically active substances (biologically active additives) for introduction into the product being developed, which includes the following sub-stages:

- Study of the influence of functional ingredients or biologically active substances (biologically active additives) on the technological properties of raw materials (recipe components) and semi-finished products;
- Study of the influence of functional ingredients or biologically active substances (biologically active additives) on the quality and consumer properties of the finished product.

The fourth stage is the development of recipes and technology for the production of a healthy food product, which includes the following sub-stages:

- Development of product formulations, taking into account the identified effective dosages of functional ingredients or biologically active substances (biologically active additives);
- Substantiation and development of technological regimes for the preparation of functional ingredients or biologically active substances (biologically active additives) for introduction, justification of the choice of the stage for introduction and an effective method of their introduction, which allows maximum preservation of functional ingredients or biologically active substances in the product;
- Adjustment (clarification) of technological modes of each stage of product production, taking into account the developed effective modes of preparation and introduction of functional ingredients or biologically active substances (biologically active additives).

The fifth stage is a study of the consumer properties of the developed healthy food product, which includes the following sub-stages:

- Development of pilot batches of a healthy food product according to the developed recipe and technological regimes;
- Research of organoleptic and physicochemical quality indicators;
- Study of hygienic and microbiological safety indicators;
- Research of the content of functional ingredients (biologically active substances) and determination of the level of satisfaction of an adequate norm in functional ingredients or biologically active substances when consuming the recommended amount of a product in order to position the developed product as a healthy food product (enriched, specialized or functional);
- Study of the effect of storage terms and conditions on the preservation of functional ingredients and biologically active substances in the product and the establishment of guaranteed shelf life.

The sixth stage is the development and approval of a set of technical documentation, including technical specifications for the product and technological instructions for its production.

At the final seventh stage, an assessment of the economic efficiency of the use of functional ingredients or biologically active substances (biologically active additives) is carried out, as well as an assessment of the social effect of the use of the developed healthy food product in the diet [5].

Conclusion

It should be noted that such an integrated methodological approach to the creation of healthy food products makes it possible to reasonably and reasonably choose the main object - a basic food product, as well as food functional ingredients or biologically active substances, including biologically active additives containing a complex of functional ingredients and obtained from plant raw materials.

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