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FUNCTIONAL FOODS IN HUMAN NUTRITION

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Annotation

In this regard, there is a need to develop such food products that could providea person with the necessary amount of vital nutrients and, thus, maintain a high level of health. The basic concepts of food, prevention, and functional food products are given. The article highlights the experience of using functional products in catering for children's groups with an analysis of the effectiveness of healthimprovement. Prospects for the use of functional products by the population are given.

Keywords

Nutrition, functional foods, prospects, health, adults, children, primary prevention, secondary prevention, therapeutic nutrition, functional foods.

The health status of the population depends on many factors: social, economic, environmental, etc., but in the first place is the way of life of a person [1,2,3]. And nutrition plays a significant role in the lifestyle [2,4,5,6]. If earlier human laborwas mostly energy-based and to cover energy consumption, a person consumed a large amount of food, which, as a rule, contained asufficient amount of macro-and microelements, vitamins, etc., at present, with mechanized and intellectual labor, a person uses less food in nutrition and, accordingly, less insufficient nutrition. the amountof essential nutrients and micronutrients [7,8].

The organization of proper nutrition for children depends on adults, who, unfortunately, are not always "literate" in this problem, and, accordingly, children may have a shortage of certain nutrients. In this regard, there is a need to develop such food products that could providea person with the necessary amount of vital nutrients and,thus, maintain a high level of health [9,10].

It should also be taken into account that in the structure of the general morbidity of the population, diseases of the digestive system, eating disorders and metabolism occupy the 4th, 5th, and 6th rank places in different periods; in the children's population, these diseases occupy the 2nd-3rd rank places. However, the

forecast of the incidence of childrenwith diseases of the digestive system suggests its increase. In 2016, the indicatorsof preventive examinations of children and adolescents in educational institutions conducted in the Udmurt Republic indicated a trend towards an increase in suchpathological conditions as postural disorders, scoliosis, and decreased visual acuity, which is to some extent associated with deficiencies in the organization of school meals [11,12].

The role of prevention of these diseases already in childhood is very important, since in the future, negative indicators of children's health will also affect thelevel of adult health.

It is known that theimpact on the body through food is not burdensome for it and evenevokes positive emotions of satisfaction, since both the body's desires and the possibilities of a large selection of products, for example, functional nutrition, can coincide [13,14,15,16]. Medical procedures and any activities in this regard lose out. However, in any case, when organizing individual nutrition, it is necessary to take into account the level of human health, and a modern practically healthy person, due to the peculiarities of the socio-ecological situation and the quality of products, requiresadditional enrichment of the diet with certain nutrients, thus carrying out disease prevention.

According to the Large Medical Dictionary, this is a system of measures to prevent diseases, protect health and prolong human life [17,18].

Primary prevention is a system of measures to preventthe occurrence and impact of risk factors for the development of diseases.

Secondary prevention is a set of measures aimed ateliminating pronounced risk factors that, under certain conditions, can lead to the occurrence, exacerbation and relapseof diseases [19,20]. Improving the level of health and body defenses by introducing a rational diet is one of the links of secondary prevention.

Thus, in primary and secondary prevention, among other measures, it is assumed to organize proper, rational nutrition in organized groups or individuals, which will contribute to the preventionof diseases. It is appropriate to recall that **under**arational diet is meant the nutrition of a practically healthy person.

Preventive nutrition is also understood as the nutrition of a healthy person, but who is daily exposed to harmful factors in production, and the purpose of such nutrition is the same as rational nutrition, but it also aims to weaken the effect of harmful factors affecting the worker's body.

Therapeutic nutrition should be a mandatory background for other therapeutic activities. It should be used for all diseases, since the chemical components of food are involved in the processes of inter-daily metabolism, the violation of which occurs in all diseases [21,22,23]. In recent years, the term

"functional nutrition" has appeared in the literature devoted to the organization of nutrition, **«Functional food products »,** i.e. nutrition that, due tothe additional inclusion of functional ingredients in the diet, not only meets the physiological needs of the human body in foodsubstances and energy, but also performs preventive and curative tasks,helps protect the human body from cancer. This is nutrition that contributes to the improvement of the functioning of all organs and systems of the human body [24,25].

Functional food products –are precisely food products, food of natural or artificial origin that have apleasant taste and a pronounced health-improving effect for a person, are convenient to use, are intended for systematic use as part of the daily diet and have passed long-term clinical trials, and haveconfirmed medical documentation.

In accordance with international practice, a product is considered functional if the regulated content of micronutrients in it is sufficient to meet25-50% of the average daily need for these components [26,27].

Based on the concept of functional products, they are produced with a certain required chemical composition, which makes it possible to purposefully usethem to restore impaired functions.

Functional food has a pronounced effect that regulatescertain processes in the body, for example, strengthening the mechanism of biologicalprotection, preventing a certain disease, controlling the physical and mentalstate, slowing down aging [28,29,30].

Freeze-drying is often used to produce the individual ingredients of a functional product, which includes two stages: freezingand drying. At the same time, the faster and deeper the product is frozen, the easier it is to dry and the more valuable properties it retains. A sharp, sudden cold does not allow any vitamin or trace element to disappear – it "keeps" them inside. This preserves the biological value of the product, its taste qualities and does not require the use of preservatives or flavor enhancers [31,32].

The production of functional food products is carriedout in accordance with international standards, the legislative framework in the form of regulatory-documents, recommendations, resolutions, certificates, declarations ofcompliance at various levels.

We used functional nutrition products specifically forthe prevention and rehabilitation of children in organized groups.

Assessment of children's health status was carried out twice: in the first two days after admission and the day before the end of the shift, i.e. after the implementation of the program that includes functional nutrition. Available

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informational and non-invasive research methods were used to assess the effectiveness of children's health improvement [33,34,35].

The presence or absence of chronic fatigue was determined, the Lusher color test, the author's "Broken Lines" mental performance test were conducted, and the body's vitamin C content was determined.

To objectively assess the effectiveness of implementing a wellness program with additional nutrition, all studies were conducted in two groups-observation and comparison [36,37].

The dynamics of health indicators for tests is presented in the table. 1 and 2. It should also be noted that urban children from dysfunctional families were observed in the comparison group. The initial level of health of these children was lower comparedto rural children: for example, 1.9 diseases per urban child, and 0.95 for rural children.

Table 1

Dynamics of performance indicators by tests (observation group)

Observation period	**Securityofvit organization security. C (%)**	**Name of test methods**			
		Presence of-знаков хро-signs of chronic fatigue (%)	**Polyline Test**		**SAN test, (points)**
			Производитель-Working capacity (cm)	**Work quality, errors (%)боты, ошибки (%)**	
Before introducing the program	93,5	20,0±8,0	71,9±4,0	1,7±0,8	5,7±0,3
After introducing the program	100	0	84,0±4,3	2,5±1,0	6,7±0,3

Table 2

Dynamics of performance indicators by tests (comparison group)

Observation period	**Securityofvit organization security. C (%)**	**Name of test methods**			
		Presence ofsigns-of chronicfatigue (%)	**Polyline Test**		**SAN test, (points)**
			Workingcapacity-(cm)	**Quality of work (errors/cm)**	
Before introducing the program	65,7±11,5	22,7%±9,5	63,4±8,6	2,9±0,5	6,5±0,25
After introducing the program	77,7±10,1	11,1%±5,4	79,9±6,7	2,8±0,7	6,9±0,14

After statistical processing, when analyzing the dynamics of indicators of-psychophysiological studies, it was found that it was positive: in both groups-(observations and comparisons), the number of children withsigns of chronic

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fatigue decreased, the productivity and quality of work performed increased, the number of children with a high score on the SAN test increased, and the body's supply of vitamin C improved. In such a situation, with a relatively small number ofchildren surveyed, it is difficult to objectively assess the effectiveness of the developed and implemented program [38,39,40]. Therefore, we considered it possible to evaluate the effectiveness ofthe implementation of the functional nutrition program by the intensity of increasing the indicatorsof recovery of the body in two groups for the same period of stay in the sanatorium (Table 3).

Table 3

The degree of improvement in the indicators of the observation group in comparison with the comparison group (%)

Securityof oprathe vit organ. C	Name of test methods		
	Presence of signs of chronicof chronic	fatigue "Broken lines" test (quality of work, errors,%)	SAN test,
1.7 times	1.9 times	3.3 times	2.4

With such a comparison and analysis of the results of the study, it wasfound that in the observation group, the increase in all indicators, in our opinion, occurredmore intensively, by 1.8–3.5 times, compared with similarindicators in the comparison group (Table 3).

An increase in the quality of body functions (in terms of the final indicators of-symptoms) occurred due to the additional introduction of functional nutrition products into the wellness program [41,42].

Our experience in using functional nutrition products allows us torecommend the following:

1. When organizing functional nutrition for health-improving purposes in children's groups of educational institutions, a special program should be developed, for example, "School nutrition is the key to health and successful study", which must include educational and training seminars forteachers, schoolchildren and parents, where it is planned to conduct informational and medical-pedagogical classes according to specially developed thematic plans.
2. Each program should include a section for diagnostics of students ' health level, indicatorsof learning success and psychological status.
3. Control over the organization of functional nutrition and program implementation.
4. Before starting the introduction of the program, you can open a small tasting cafe in the school cafeteria, where everyone can try functional food products, as well as learn howto prepare food from them, in particular soups and porridges, which can be used ina time deficit at home and in other conditions.

5. Evaluation of the effectiveness of the program implementation is proposed to be carried out according to various medical and pedagogical indicators.

The program may be larger or smaller in terms of volume, the number of-functional food products used, and the number of participants, but in all cases there should be an individual approach to the participant and monitoring by medical professionals. For example, if a childhas thyroid disease, you should consult a doctor: does the child need, for example, jelly or another product containing iodine?

For the organization of functional nutrition in industrial enterprises with unfavorable working conditions, it is also necessary to develop a programthat should contain information about specific unfavorable factors ofproduction, and accordingly justify the selection of functional nutrition products and the mode of their implementation [43,44].

The effectiveness of the program implementation can be assessed by various клиническиclinical, hygienic, psychological, and economic indicators. We recommend using questionnaires based on the unified and certified SAN and Lusher tests, and for educational institutions, we recommend additionallyusing tests for assessing psychological status and the degree of chronic fatigue [45].

In our opinion, such an organization of functional nutrition in any group will contribute to improving the health of children and adults, as well as anobjective, scientifically based assessment of the use of functional products.

Domestic experience shows that, apparently, the most rational way to solve the problem of nutritional deficiency (or partial starvation) is to produce functional products enriched with the necessary ingredients [46].

It is quite likely that functional nutrition is the future, whena person chooses the necessary functional products according to their capabilities, needs and tastes.

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