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INNOVATIVE APPROACHES IN DEVELOPMENT OF FUNCTIONAL PRODUCTS FOR RESTAURANT HOLDINGS

The priority direction of development of the sphere of restaurant services is to bring their quality to international standards and to improve technologies, introduction of new types and forms of service, which will allow to more fully meet the needs of customers. The key to the efficiency of the food industry and restaurant industry is the implementation of resource-saving and competitive technologies. The state's nutrition and health policies can make a significant contribution to preventing premature death and disease. Improving the nutritional structure of the population of Ukraine is the improvement of traditional and creation of the latest technologies of functional products[1].

Nutrition plays a major role in human life and has a significant impact on health, because it ensures the development of the body, efficiency, protects against harmful environmental conditions, is a way of prevention and treatment of diseases [2].

In the post-industrial society, the awareness of the population on nutrition, organization of functional nutrition on the background of a sharp increase in population mobility is significantly increased. The

population worries about their health and tries to eat high-quality food, which does not harm their health and only bring benefits. This puts increased demands on the level of service in catering establishments [3].

For restaurants, the important task was the development and introduction into production of technologies of products of functional purpose.

The functional products reduce the risk of disease through prophylactic action, accelerate recovery through balanced composition, enrich the diet with the necessary vitamins, minerals and other nutrients, increase endurance of the body, provided for use by all groups of the population. [4]. They are a component of dietary rations, and their positive effect on the body is due to the presence of functional ingredients in their composition, which has a beneficial effect on the physiological functions of the organism. Functional products are created on the principles of food combinatorics by selecting the main ingredients, additives, the combination of which ensures the formation of not only high organoleptic and physico-chemical parameters, but also a given level of biological and energy value [5].

The places of restaurant establishments which begin to embody the idea of a healthy lifestyle are high quality restaurants (sector "fine dining"). Their menu consists of healthy food, no extra fats, preservatives and other nutritional supplements. Roasting and marinating is not used. Baking, cooking and steaming are predominant. Eating in high quality restaurants can be based on offers such as the menu of balanced organic foods; vegetarian cuisine; Vedic cuisine, etc. Many restaurants specialize in the manufacture of all eco-friendly food and beverages; have a wide range of health-improving drinks in the menu: phyto-tea; The presence of low-calorie dishes and drinks, for example, is supplemented with special cocktails menu with different healing properties. These are cocktails that serve as immunomodulators, detoxicants, energy engineers [3].

The places of restaurant establishments are trying to enter such foods in a diet, because when they are consumed, the body receives the various nutrients it needs, and they also strengthen immunity. Functional products include previously studied vegetable ingredients that are indispensable for humans. Introduction to the production of functional products allows you to produce food products enriched with essential amino acids, trace elements, vitamins, food fibers, etc. [6].

The recipes have been developed and the technologies of production of food products from freshwater fish with the addition of vegetable raw

materials (“Fish cutlets with cauliflower”, “Fish schnitzels from broccoli”, fish breads “Kale”) have been improved, samples of these products have been tested and introduced in production conditions of LLC “Arco” Kyiv.

New fish cuisine can be recommended for restaurants that specialize in a menu of functional dishes. The introduction of such products can increase the competitiveness, improve the image of the institution [7].

As a fish raw material, freshwater fish (pike perch) are selected, which is more accessible, because it can be grown in the water bodies of Ukraine.

Of all kinds of freshwater fish, pike perch has a low fat content and high levels of protein, therefore pike perch is considered to be dietary (Table 1.2) [8].

Table 1.2

Nutrient composition of pike perch [8]

Macroelements (mg)						
K	Ca	Mg	Na	S	P	Cl
280	35	25	35	188	230	50
Microelements (mkg)						
Fe	I	Mn	Cu	Ni	Cr	Zn
500	5	50	110	6	55	700
Vitamins (mg)						
A	E	C	B_1	B_2	B_3	B_6
0,01	1,8	3,0	0,08	0,11	1,0	0,19

Pike perch on the contents of essential amino acids is not inferior to other species of fish, and the content of isoleucine, methionine and cystine exceeds their content in the cabbage, lily, carp, which indicates the high biological value of pikeperch meat [8].

In the development of new recipes of fish culinary products used cabbage blossom (Brassica oleracea var. botrytis), broccoli (Brassica oleracea var. italica). Table 1.3 shows the intramuscular composition of different types of cabbage [8;9]. It can be seen from the data in the table that the content of the main nutrients in the cabbage of cauliflower, broccoli and Calais in most of the components exceeds their content in white and Brassica oleracea.

The protein of these types of cabbage approaches the biological value of proteins of perfected products.

Table 1.3

Nutrient content of various types of cabbage [8; 9]

	White cabbage	*Cauliflower*	*Broccoli*	*Calais*
Proteins (g)	1,8	2,5	2,84	2
Fats(g)	0,1	0,3	0,37	0,1
Carbohydrates (g)	4,7 (2,2)	4,2 (2,1)	6,64 (2,6)	6,0 (0,5)
β-carotene(mg)	0,02	0,02	0,39	0,25
Vitamin B1(mg)	0,03	0,1	0,07	0,04
Vitamin B_2(mg)	0,04	0,1	0,2	0,03
Vitamin B_6(mg)	0,1	0,2	0,2	0,2
Vitamin B_9(mg)	0,01	0,023	0,064	0,01
Potassium (P) (mg)	300	210	316	230
Vitamin C (mg)	36,6	48,2	89,3	31
Calcium (Ca)(mg)	48	26	47	40
Magnesium (Mg) (mg)	16	17	21	14
Phosporus (P) (mg)	31	51	66	34

Table 1.4 shows that the white cabbage, Broccoli and Calais is full, contains all the essential amino acids that are close to the proteins of the normal products.

Thanks to the introduction of cabbage to traditional recipes of culinary products from fish, they are enriched with macro- and micronutrients, vitamins, and food fibers. By partially replacing fish meat with cabbage, the caloric content of the products is reduced.

The composition of cabbage vegetables includes the substance sulforaphane, which according to the International Cancer Research Institute (International Agency for Research on Cancer, IARC prevents the formation and development of cancer cells [10]. In addition to sulforaparane, these types of cabbage contain such anti-inflammatory substances as indole-3-carbine and synergin. The first activates the ability of the immune system to resist the formation of cancer cells, while the second significantly reduces the risk of tumors, provides antioxidant protection, preventing cell damage by free radicals of oxygen [11].

It is established that the proposed cabbage raw material positively affects the quality of fish culinary products. They have attractive exterior finishes, the right shape, a pleasant color, juicy, delicate consistency, garmonyous smell and taste. The mass fraction of dry

Table 1.4

Comparative characteristics of the amino acid composition of cauliflower, Broccoli, Calais and products of animal origin (mg/1g protein)

Amino acid	*Brassica oleracea*	*Broccoli*	*Calais*	*Buckwheat*	*Chiken egg*	*Chicken's meat*	*Pork*
Valin	59,60	61,6	59,6	47,6	60,48	48,1	55,6
Isoleucine	50,30	52,30	50,30	43,7	47,0	38,07	47,5
Leucine	59,60	59,0	59,6	78,6	85,11	77,5	75,4
Lizin	64,32	61,0	64,3	24,7	71,10	87,2	79,9
Methionine + Cystine	42,1	41,2	42,1	36,7	56,45	38,1	37
Tryptophan	13,65	11,6	13,6	10,7	16,06	16,0	13,4
Fenilalanin + tyrosine	70,3	68,6	70,3	78,6	81,34	76,1	73,9
Treon	41,3	43,3	41,3	30,6	48,03	48,6	47,1

matter in the developed samples of fish culinary products is less than in prototypes. This improves the organo-lepidine performance of new products, namely consistency – it becomes juicy. Also, the mass fraction of fat is reduced, therefore, new fish cuisines can be recommended as a product in dietary nutrition.

The biological value of the developed products is calculated by the method of amino acid acceleration.

Gives an example of the calculation of the amino acid-fast of fish cuisine products "Fish Chives with Cauliflower".

The first limiting amino acid is Valin (AC= 90,9 %), thus, the protein of the fish cutlet with cauliflower is digested on 90,9%.

Standard and original indicators have been determined for the quantification of quality. Standard quality indicators – organo-lepido, physico-chemical indicators, safety indicators, and microbiological ones. The original indicators include the content of proteins, carbohydrates, fats, minerals, vitamins.

Table 1.5

Amino acid fasting fish fish cutlets "Fish cutlets with cauliflower"

Amino acid	*The contents of AK in the ideal protein*	*The contents of AK in chops*		Amino acid fasting, *%*
		mg/100g	*mg/1g of protein*	
Valin	50	342,8	45,7	90,9
Isoleucine	40	336,6	44,8	111,8
Leucine	70	532,5	70,9	101,2
Lizin	55	490,0	65,3	117,9
Methionine + Cystine	35	284,3	37,8	107,8
Tryptophan	10	154,8	20,5	201,3
Fenilalanine + tyrosine	60	528,6	70,4	116,3
Treon	40	287,5	38,3	95,0

In the new product "Fish Chops with Cauliflower" the content of calcium increased by 1.7 mg, iron by 0.29 mg, vitamins B1, B3, B6 C, β-carotene (mg) by 0.011; 0.26; 0.07; 11; 0.5 respectively. Fat content decreased by 0.5 g, food fibers - increased by 2.7 g.

Thus, samples of developed fish cooking products are covered with certain organs: "Fish cutlets with cauliflower" (calcium, iron, vitamins B, C, β-carotene), "Fish schnitzels with cabbage Broccoli" (potassium, calcium, iron, phosphorus, vitamins B, C, β-carotene). Partial replacement of pike perch fillet on cabbage vegetables has led to a decrease in the fat content of samples "Fish Chives with Cauliflower", "Fish Shinnitsely with Cabbage Broccoli" – by 13.9; 13.9% respectively. The introduction of vegetable raw materials into traditional recipes of fish cutlets, fish schnitzels enriched samples of new products with food fibers (from 16 to 23%).

Consequently, new types of fish and vegetable culinary products can be recommended for specialized restaurants of the restaurant industry as functional products. The introduction of such products into the menu will increase the efficiency of the operation of enterprises in the restaurant industry.

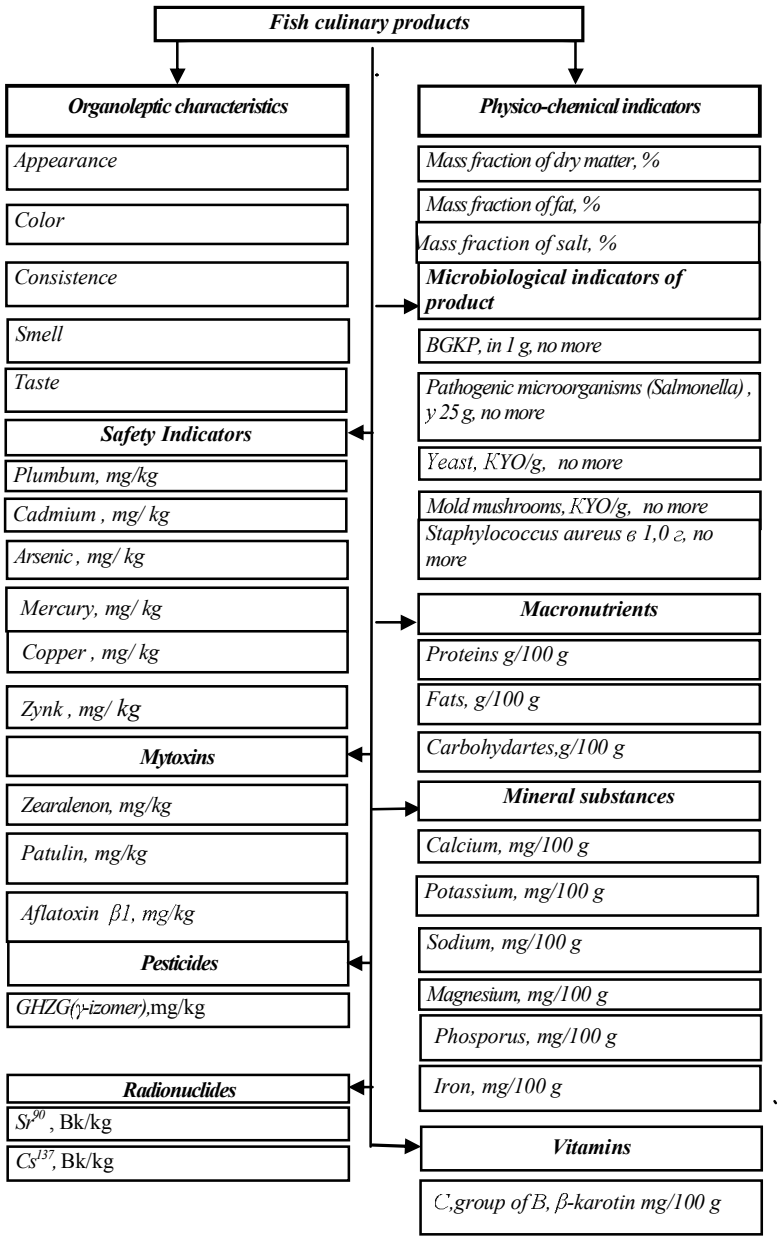

Figure 1.5 Hierarchical structure of quality indicators

The Harrington method provides a comprehensive assessment of the quality of fish culinary products. This method involves 5 intervals, in the marginal scale of the scale from 1 to 0: 1.00 ... 0.80 - very good (excellent); 0,80 ... 0,63 - good; 0.63 ... 0.37 - satisfactory; 0,37 ... 0,20 - bad; 0,20 ... 0,00 - very bad.

Table 1.6

The scale of the nodal values of the quality indicators of fish cutlets "Fish cutlets with cauliflower"

Metric name, unit of measurement	*Grade K_i*					
	1,00	0,80	0,65	**0,37**	0,20	0,00
	Coded value IN					
	3,00	1,50	0,85	**0,00**	-0,50	-3,00
1	2	3	4	5	6	7
Organoleptic indicators						
Appearance	5,0	4,0	3,0	**2,0**	1,5	1,0
Colour	5,0	4,0	3,0	**2,0**	1,5	1,0
Consistence	5,0	4,0	3,0	**2,0**	1,5	1,0
Smell	5,0	4,0	3,0	**2,0**	1,5	1,0
Taste	5,0	4,0	3,0	**2,0**	1,5	1,0
Physico-chemical indicators						
Mass fraction of dry matter , %	21,8	22,1	22,5	**22,9**	23,7	24,5
Mass fraction of fat , %	1,75	1,8	1,9	**2,02**	2,5	3,0
Mass fraction of salt,%	0,35	0,4	0,45	**0,5**	**0,7**	0,8
Safety Indicators						
Plumbum, mg/кg, no more	0,03	0,05	0,07	**0,1**	0,2	0,5
Cadmium, mg/кg, no more	0,005	0,01	0,02	**0,03**	0,2	0,4
Arsenic, mg/кg, no more	0,001	0,005	0,01	**0,05**	0,2	0,6
Mercury, mg/кg, no more	0,001	0,002	0,003	**0,005**	0,1	0,3
Zynk, mg/кg, no more	2,0	3,0	4,0	**5,0**	7,0	9,0
Copper, mg/кg, no more	0,05	0,1	0,3	**0,5**	1,0	1,4
Mikotoxics						
Zaarenol, mg/кg, no more	0,0	0,3	0,6	**1,0**	1,5	2,0
Patulin , mg/кg, no more	0,0	0,01	0,03	**0,05**	0,1	0,2
Aflatoxin β1, mg/кg, no more	0,0	0,001	0,003	**0,005**	0,01	0,02

Table 1.6 (continued)

1		2	3	4	5	6	7
Pesticides							
GXLIG(γ-isomers), mg/кg, no more		0,0	0,01	0,5	**1,0**	1,5	2,0
Heptachlor GFH (heptachlor epoxide), mg/кg, no more		0,0	0,0	0,0	**0,0**	0,0	0,0
Radionuclides							
Cs^{137}, Bk/kg		10	200	400	**600**	800	1000
Sr^{90}, Bk/kg		10	100	150	**200**	400	600
Microbiological indicators							
Number of MAPAnM in 1 cm3, KUO, no more		1·10	5·10	$5·10^2$	**$5·10^3$**	$2·10^4$	$5·10^4$
Bacteria of the E. coli group in0,1 $см^3$, no more		0,0	0,0	0,0	**0,0**	0,1	0,3
Staphylococcus aureus в 1,0 $см^3$of product, no more		0,0	0,0	0,0	**0,0**	0,1	0,3
Pathogenic microorganisms, in particular bacteria of the genusSalmonella, в 25 g of product, no more		0,0	0,0	0,0	**0,0**	0,1	0,3
Yeast KUO, no more в 1 g of product, no more		0,0	0,0	0,0	**0,0**	0,5	1,0
Mold mushrooms KUO, в 1 g of product, no more		2	20	50	**100**	200	300
Macronutrients, g							
Proteins in 100 g of product	New product	9,9	9,3	8,9	**8,43**	7,5	7,0
	Prototypes	13,8	13,2	12,0	**11,8**	11,0	10,0
Fats in 100 g of product	New product	2,1	2,5	2,8	**3,1**	4,1	4,8
	Prototypes	2,3	2,8	3,1	**3,6**	4,6	5,2
Carbohydrates in 100 g of product	New product	28,9	28,0	27,5	**26,8**	9,3	8,5
	Prototypes	26,9	26,1	25,0	**24,1**	23,0	21,2
Mineral substances, mg							

Table 1.6 (the end)

1		2	3	4	5	6	7
Calcium in 100 g of product	New product	89,8	89,2	88,5	**87,9**	86,3	85,2
	Prototypes	89,6	88,3	87,4	**86,2**	84,5	82,1
Potassium in 100 g of product	New product	250,5	248,2	247,5	**246,7**	244,1	242,1
	Prototypes	274,4	274,2	273,9	**272,3**	265,0	259,0
Natrium in 100 g of product	New product	127,3	126,4	125,7	**124,9**	123,0	122,1
	Prototypes	137,2	136,1	135,2	**133,3**	127,0	122,1
Magnium in 100 g of product	New product	32,1	31,6	30,9	**29,84**	27,0	25,2
	Prototypes	34,8	34,2	33,5	**32,65**	30,5	28,9
Phosporus in 100 g of product	New product	160,1	158,4	157,0	**154,65**	145,1	134,5
	Prototypes	224,3	219,4	215,5	**213,1**	209,1	202,3
Iron in 100 g of product	New product	1,86	1,67	1,55	**1,34**	1,10	0,86
	Prototypes	1,3	1,25	1,2	**1,05**	0,9	0,75
Vitamins, mg							
Vitamin in B_1 in 100 g of product	New product	0,09	0,08	0,07	**0,062**	0,05	0,04
	Prototypes	0,09	0,08	0,06	**0,055**	0,04	0,03
Vitamin B_2 in 100 g of product	New product	0,13	0,11	0,09	**0,067**	0,04	0,02
	Prototypes	0,13	0,11	0,09	**0,07**	0,05	0,02
Vitamin B_3 in 100 g of product	New product	0,9	0,7	0,5	**0,3**	0,15	0,05
	Prototypes	0,1	0,08	0,06	**0,04**	0,02	0,01
Vitamin B_6 in 100 g of product	New product	0,63	0,52	0,42	**0,33**	0,26	0,13
	Prototypes	0,39	0,35	0,29	**0,26**	0,15	0,13
Vitamin C in 100 g of product	New product	27,6	26,3	25,5	**24,4**	22,6	17,5
	Prototypes	4,9	4,4	3,9	**3,4**	2,8	2,5
β-carotene in 100 g of product	New product	1,05	0,9	0,85	**0,8**	0,6	0,4
	Prototypes	0,9	0,7	0,5	**0,3**	0,02	0

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THE DUALISM OF THE OBJECTIVES OF INNOVATION MANAGEMENT IN THE CONTEXT OF THE DEVELOPMENT OF COMPETITIVE ADVANTAGES OF THE ENTERPRISE

World practice of economic activity shows that innovative activity of enterprises is one of the most powerful sources of opposition to competitors and maintenance of high rates of economic development. The activity of industrial enterprises in the creation of product and process innovations gives him the opportunity to act ahead of the curve – to form new consumer needs, to create new market segments that can be quite capacious and provide innovators with significant commercial returns. Due to this, the company will be able to further accumulate resources for its quantitative growth and qualitative development. At the same time, it is important to ensure the proper return on the implementation of innovations – sufficient for business entities (the business owners and its management) to be motivated to give preference to innovative factors, developing a strategy of behavior in the market and forming an appropriate innovative potential for this.