

IMPLEMENTATION OF THE CONCEPT OF HEALTHY FOOD IN RESTAURANTS

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Abstract

Food refers to the most important factors of the environment, which directly affect the human body throughout life. Proper nutrition is an important part of a balanced diet. The regime provides regular meals at certain hours at certain intervals, as well as the distribution of the daily diet by energy value during the day. Adherence to the diet ensures the rhythmic functioning of the digestive system, normal digestion and proper metabolism. The food ration should be composed so that its energy value covers the body's energy expenditure. The organization of a balanced diet is one of the most important factors in maintaining good health and improving efficiency. The diet should be composed so that its energy value covers the body's energy expenditure.

Promising in this regard is the introduction of the concept of healthy eating in the daily diet of athletes in various sports. After all, the trends of modern healthy eating show a growing interest among athletes in various sports.

The aim of research is to introduce the concept of healthy eating in sports and recreation and restaurants.

The following research methods were used in the work: observation analysis (diet), organoleptic evaluation, statistical data processing, consumer evaluation of finished restaurant products according to DSTU.

To fulfill our tasks of theoretical generalizations and experimental research, scientifically substantiated the introduction of the concept of healthy eating in the diets, as well as balanced the ingredient composition of the diet by developing and adding chopped semi-finished products using beef and raw materials.

In our work let's offer an innovative model for the use of meatballs for health purposes in the diets of athletes with playing sports.

Keywords: nutrition, healthy eating, meat products, functional plant ingredients, organoleptic evaluation.

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1. Introduction

Functional food technology is an approaching applied science that claims to boost health or well-being by providing account beyond that of essential nutrition. Meat and meat products have diverse disease preventing and health stimulating benefits that's make them a feasible choice to be used as a functional food [1–5].

The food system of modern man, processes of globalization occurring in the sphere of providing the population with products food, In recent years, a new approach to the enrichment of food products has been proposed, which involves the use of a complex of ingredients for the purposeful prevention of specific human health problems: ensuring eye health, improving mental activity and memory, increasing immunity, increasing the strength of teeth and bones, creating external attractiveness [6–10].

Sports nutrition, which is an integral part of technology and dietetics and deals with every-thing aspects of the impact of food (nutrition) and its components (nutrients) on the life and health of an active person engages in sports, adaptation of the diet (diet) to the changing conditions of everyday life, training and competition to achieve peak physical fitness and the processes by which The athlete's body consumes, assimilates, transports, utilizes and excretes all components of the diet and needs the introduction of valuable components [11–13].

The scientific basis of the organization of the rational nutrition of the population is the physiological and hygienic requirements for the food ration, the diet and the conditions of eating [14].

Functional food or nutraceuticals is a new trend in food science. The use of nutraceuticals for the treatment of human diseases has become a popular topic of research recently. Functional products contain bioactive ingredients that contribute to human physiological development and help fight chronic diseases. Most pharmacological synthetic drugs have side effects that can negatively affect human health. On the other hand, functional food can provide natural cures for most human diseases and can also prevent them by boosting the body's immune system. Nutraceuticals have proven their effectiveness against cancer, tumors, diabetes, obesity, high blood pressure, premature aging, blood detoxification, etc. [15, 16].

Awareness of meat consumption and alternative foods according to sustainable dietary habits. This study was conducted to provide basic data for education on sustainable dietary habits by examining the status of meat consumption and perception of alternative foods according to sustainable dietary habits among college students. The results of the study are as follows. As a result of examining meat consumption, 30.9 % of them chose meat when eating out, and males were significantly higher. As for the frequency of meat consumption, '2-3 times a week' accounted for the most at 47 %, and males were significantly higher. The most preferred meat was pork with 47.9 %, and 'taste' was the highest at 85 %. Men ate a lot of meat when eating out, and the number of meat intake was high. Most of the meat selection is based on taste, so education is necessary to consider other factors. It was expected that meat consumption would decrease due to the strong tendency to consume sustainable food as people adopt a sustainable diet, but there was no significant difference in meat consumption according to the degree of sustainable dietary habits [17].

Consumers' food selections have a large impact on the environment. In this study, let's examine how consumers evaluated the environmental impact of various foods. Furthermore, let's investigate whether the perceived environmental effect of foods, health consciousness, and food disgust sensitivity would be related to the consumption of meat substitutes and organic meat [18].

The increasing needs of the population of Ukraine in products health-care destination has led to creation and development of a new direction in the development and production of meat products from unconventional resources available plant materials. In the manufacture of new types of meat food products, more attention is paid to the use of the protein of vegetable origin. Eating foods enriched with sea algae, removes toxins, heavy metals and radionuclides, normalizes the function of the Central nervous system; eliminates mineral deficiency; reduces blood viscosity and improves vascular tone; promotes normal functioning of the thyroid gland and increases immunity. Today, the actual direction of the food industry are the production of foodstuff, which, due to the presence in its composition of biologically active components that can improve human health, to ensure and improve the functioning of all systems and body functions [19, 20].

2. Materials and methods

Meat semi-finished products based on meat and vegetable raw materials are a promising category of products for enriching the diet with whole foods.

In order to assess the possibility of using lupine flour in chopped semi-finished products as a substitute for part of the meat raw material in combination with a traditional texture-forming filler (wheat bread), the amino acid composition of semi-finished products was modeled.

Taking into account the high protein content of legumes, which include various types of flour, at the modeling stage a comparison of the effect of the use of chickpea, wheat, grape seed and green pea flour on the change in the amino acid composition of semi-finished products was carried out.

The amount of chickpea, wheat, grape seed and green pea flour in the recipes varied as a substitute for second-grade (cutlet) beef.

In the process of research, model recipes of chopped meat semi-finished products were developed based on the combination of meat raw materials and vegetable fillers. In this capacity, traditional recipe ingredients were used: wheat bread, breadcrumbs, onion, as a protein filler – chickpea, wheat, grape seed and green pea flour. To enrich the spicy-aromatic qualities, oregano and basil were added to the recipe, replacing 50 % of black pepper.

The recipe ratios of the used raw materials and the control sample are given in the **Table 1**.

Table 1

Recipe ratios of the used raw materials and the control sample

The name of the raw material	CONTROL according to DSTU	Recipe No. 1	Recipe No. 2	Recipe No. 3
Beef (cutlet meat)	54.0	54.0	54.0	54.0
Wheat	flour	chickpeas.	grape seeds	green peas
Raw fat	5.0	5.0	5.0	5.0
Wheat bread	13.0	13.0	13.0	13.0
Breadcrumbs	2.0	2.0	2.0	2.0
Onion	3.0	3.0	3.0	3.0
Ground black pepper	0.1	0.1	0.1	0.1
Oregano	–	–	–	–
Food salt	1.2	1.2	1.2	1.2
Water	21.7	21.7	21.7	21.7
Product output	100	100	100	100

3. Results and discussion

Nutritional and biological value of different types of vegetable flour, which is used for the technology of cooking meatballs.

Durum wheat flour. Durum wheat is a type of wheat rich in gluten. This species has been known since the Neolithic era. The culture grows quickly, has excellent taste qualities. For normal development, hard varieties of wheat need heat and nutritious soil. Nutritional value of wheat flour of hard varieties per 100 g: proteins – 11.5; fats – 1.3; carbohydrates – 62.1, energy value – 327 kcal.

Due to the chemical composition and nutritional value of wheat flour, this ingredient is widely used in baking. Its benefit is felt in its high energy value. Nutritionists do not recommend including flour in the diet of people who are prone to obesity. Its carbohydrates are capable of releasing an incredible amount of energy, which can only be spent during sports. In the absence of activity, excess calories are stored. There is a worsening of metabolic processes, the amount of sugar in the blood increases. As a result, there are prerequisites for the development of diabetes and hypertension.

Chickpea flour is a gluten-free product made from chickpea seeds. It has an unusual taste, slightly reminiscent of a nut. It is characterized by a delicate nutty aftertaste. Compared to other types of flour, it has a high content of unsaturated fatty acids and a low glycemic index. Nutritional value of chickpea flour, product per 100 g: proteins – 10.9; fats – 2.9; carbohydrates – 66.0, energy value – 327 kcal.

Adding chickpea flour to dishes increases the nutritional value, biological value, and taste of finished products. It is mainly used as part of sauces, when preparing porridges and soups, added to baking, as well as for breading fish and meat dishes.

Being a source of potassium, zinc, calcium and protein, chickpea flour also contains a lot of soluble dietary fibers (the so-called dietary fiber), which are necessary for the human body for health and full life. It has been proven that the introduction of chickpea flour into the diet improves digestive processes and strengthens immunity.

Pea flour is a product obtained by grinding dried peas. Such a product contains a large amount of protein, various minerals and vitamins. According to these indicators, pea flour surpasses even meat, and its cost is significantly lower. At the same time, it should be emphasized that this product does not contain gluten.

Nutritional value of pea flour per 100 g: proteins – 11.6, fats – 2.8, carbohydrates – 68.5, energy value – 298 kcal.

Peas contain much more citric acid than potatoes. It contains 2 times more B vitamins, 1.5 times more vitamin B2, and 5 times more vitamin PP than in types of bread made from coarsely ground flour, which are known to have more vitamins than bread. from flour of higher grades.

Grape flour is a powder that is obtained by grinding the cake of grape seeds, which remained after the production of butter. Grape flour is rich in vitamins A, C, E and especially B vitamins. In addition, grape seed powder contains a large amount of polyunsaturated fatty acids (especially linoleic), various trace elements and tannins, which gives grape flour many useful properties.

Nutritional value of grape flour, product per 100 g: proteins – 18.0, fats – 10.0, carbohydrates – 0, energy value – 162 kcal.

The development of the concept of healthy nutrition involves the improvement of the technology of chopped meat semi-finished products with the use of vegetable raw materials.

In the process of research, model recipes of chopped meat semi-finished products were developed based on the combination of meat raw materials and vegetable fillers. In this capacity, traditional recipe ingredients were used: wheat bread, breadcrumbs, onion, as a protein filler – chickpea, wheat, grape seed and green pea flour. To enrich the spicy-aromatic qualities, oregano and basil were added to the recipe, replacing 50 % of black pepper.

The principle technological scheme for the production of chopped meat semi-finished products using a variety of flour and oregano and basil is traditional with innovations.

At the first stage, mechanical culinary processing (MCP) of raw materials takes place. For meat, MCP includes removal of inedible parts of raw materials, coarse connective tissue, washing, cutting into pieces. MCP of additional raw materials consists in removing inedible parts of raw materials (onion peeling), sanitary and hygienic processing, soaking bread in water or milk.

The purpose of the second stage of product manufacturing is the formation of cutlet mass and semi-finished products from it. To do this, the raw components after MCP are ground in a meat grinder, the resulting minced meat is mixed with the simultaneous addition of prepared lupine flour to the minced meat, flavor and spicy-aromatic enhancers are added, ground again with subsequent mixing, beaten and formed into products.

At the third stage, semi-finished products are stored and heat-treated to culinary readiness, and products are prepared for sale.

Thus, it can be concluded that there is no significant difference between the basic technological scheme for the production of chopped meat semi-finished products using lupine flour and elecampane and the classic one. This confirms that the implementation of this technology is possible at any enterprise of the meat processing industry or restaurant industry: the technology does not require the installation of additional equipment, retraining of the enterprise's personnel.

To realize the goal, the production technology of developed meat cutlets was chosen, since these products have gained considerable popularity in restaurants.

Cutlets are semi-finished meat and vegetable products cut from minced meat with the addition of other components (according to the recipe) of oval, oval-flattened shape weighing from 50 g to 100 g, breaded.

According to the developed recipes, the technological scheme of meat cutlets with vegetable raw materials consists of a series of actions.

In the process of preparing raw materials, the following technological operations are provided: receiving, weighing, washing, slicing cutlet meat. The raw material is taken chilled with an internal temperature from $-2\text{ }^{\circ}\text{C}$ to $+4\text{ }^{\circ}\text{C}$ inclusive, packaged in cardboard boxes. Weigh on electronic scales. Washing is carried out at a temperature of $18\text{...}20\text{ }^{\circ}\text{C}$. Raw materials are cut into smaller pieces on the production table.

Meat raw materials are subjected to grinding on a meat grinder with a grate diameter of $3\text{...}4\text{ mm}$.

Additional components: onions and bread are subjected to preparation (onions – washing, cleaning, cutting into 4 parts; bread (soft part) – soaking in water in a stomach container). Auxiliary raw materials are subjected to grinding on a meat grinder with a grid diameter of $3\text{...}4\text{ mm}$.

At the stage of assembling the minced meat, add prepared flour of chickpeas, green peas, wheat flour, grape seeds, oregano and basil, salt, pepper and water.

Preparation of flour includes: sifting flour through a sieve with a mesh size of $150\text{ }\mu\text{m}$, hydration with water at a temperature of $95\text{--}98\text{ }^{\circ}\text{C}$ and intensive mixing for 2 min, with subsequent cooling to $t=18\text{...}20\text{ }^{\circ}\text{C}$.

Preparation of oregano and basil is grinding, sieving through a sieve with a mesh size of $150\text{ }\mu\text{m}$ and introduction at the stage of mixing with taste and spicy-aromatic enhancers.

The minced meat is mixed with subsequent beating by hand in gloves for $5\text{...}10$ minutes in a gastro container. Forming of products is carried out manually on a board. For breading, use a tray with breadcrumbs and a breading knife. Cutlet mass is divided into portions, rolled in breadcrumbs, given an oval-flattened shape, weighing 100 g, and placed on trays. Frying is carried out in the main way, using an induction stove at a temperature of $230\text{ }^{\circ}\text{C}$, for 10 minutes, frying on both sides, using vegetable oil.

Semi-finished products are kept chilled in a refrigerator for no more than 12 hours at a temperature not lower than 0 °C and not higher than 6 °C and frozen. Semi-finished products are subjected to vacuum and stored in a freezer at a temperature of –18...–21 °C for 20 days (in ZRG, this period is much shorter, taking into account the production capacity, and is 3–4 days).

For consumers, when choosing a product, its organoleptic indicators are of great importance. With the choice of an improved cooking technology, the finished product is characterized by high consumer properties, a delicate consistency and juiciness, and a well-preserved shape. The characteristics of control and experimental samples of the developed patties are given in the **Table 2**.

After processing all research results and developing samples with improved physico-chemical characteristics, the patties were tasted. The results of the statistical processing of the results are shown in graph 1, which shows the organoleptic analysis of the experimental product and its evaluation by categories.

Table 2
Organoleptic indicators of the developed patties

Quality indicator	Point assessment			
	Excellent	Good	Satisfactory	Unsatisfactory
Appearance of the food product	The shape of the patty is oval-flattened with one pointed end up to 2.0 cm thick, 10–12 cm long and 5 cm wide, the breading is applied in an even layer	The shape of the patty is oval-flattened with one pointed end up to 2.0 cm thick, 10–12 cm long and 5 cm wide, the breading is applied in an uneven layer	The shape of the patty is slightly broken, there are minor dents and cracks on the surface, the breading is applied in an uneven layer	The shape of the cutlet does not meet the requirements, the edges are «torn», there are dents and cracks on the surface, the breading is applied in an uneven layer
Color	The surface of the cutlet is golden-brown, uniform, homogenous in section, gray	The surface of the cutlet is golden-brown, uneven in places, homogeneous, gray in section	The surface of the patty is uneven with brown areas	The surface of the cutlet is heterogeneous with burnt areas, uneven in section, red-gray
Smell, aroma	Suitable for raw components	Suitable for raw components	Corresponds to raw components, with a slight extraneous smell	incompatible with raw components
Consistence	Soft, gentle, moderately elastic	Soft, elastic	Too elastic or too soft	Very elastic or ointment-like
Taste	Suitable for raw components	Suitable for raw components	Corresponds to the raw components, with a slight extraneous taste	Incompatible with raw components
Succulence	succulent	succulent	Moderately succulent	Dry, crumbly

4. Conclusions

The concept of healthy food in restaurants was implemented. The ingredient composition of the diet is balanced by developing and adding additives of increased nutritional value to meat semi-finished products. Organoleptic evaluation of these meat products was carried out and introduced into production. A comparative analysis of the obtained results allows to conclude that the best sensory characteristics are cutlets with chickpea flour, which contain 10 % of chickpea flour with a substitute for beef and a spicy-aromatic enricher of oregano and basil – 50 % with a substitute for black pepper, which confirms the feasibility of introducing this product in restaurant business and production on an industrial scale.

Conflict of interest

The authors declare that there is no conflict of interest in relation to this paper, as well as the published research results, including the financial aspects of conducting the research, obtaining and using its results, as well as any non-financial personal relationship.

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Data availability

Manuscript has no associated data.

References

- [1] Ravani, A., Sharma, H. P. (2022). Meat Based Functional Foods. *Functional Foods*, 235–287. doi: <https://doi.org/10.1002/9781119776345.ch7>
- [2] Tischenko, V. I., Bozhko, N. V., Pasichnyi, V. M. (2017). Optimization of the recipes of meat loaves using hydrobionts. *Scientific Messenger of LNU of Veterinary Medicine and Biotechnologies*, 19 (80), 38–42. doi: <https://doi.org/10.15421/nvlvet8008>
- [3] Bozhko, N., Tischenko, V., Pasichnyi, V., Moroz, O. (2019). Research of nutritional and biological value of the semi smoked meatcontaining sausage. *Food Science and Technology*, 13 (4). doi: <https://doi.org/10.15673/fst.v13i4.1561>
- [4] Santini, A. (2022). Nutraceuticals and Functional Foods: Is It Possible and Sustainable for Bridging Health and Food? *Foods*, 11 (11), 1608. doi: <https://doi.org/10.3390/foods11111608>
- [5] Agostoni, C., Boccia, S., Banni, S., Mannucci, P. M., Astrup, A. (2021). Sustainable and personalized nutrition: From earth health to public health. *European Journal of Internal Medicine*, 86, 12–16. doi: <https://doi.org/10.1016/j.ejim.2021.02.012>
- [6] Rayan, M. (2018). *Pytannya v sporti na produktyvnist'. Vse, shcho potribno znaty behunu, plovtu, velosypedystu i tryatletu*. Moscow: Mann, Yvanov y Ferber, 400.
- [7] Ukrainets, A., Pasichnyi, V., Shvedyuk, D., Matsuk, Y. (2017). Investigation of proteolysis ability of functional destined minced half-finished meat products. *Scientific Messenger of LNU of Veterinary Medicine and Biotechnologies*, 19 (75), 129–133. doi: <https://doi.org/10.15421/nvlvet7526>
- [8] Sylow, L., Tokarz, V. L., Richter, E. A., Klip, A. (2021). The many actions of insulin in skeletal muscle, the paramount tissue determining glycemia. *Cell Metabolism*, 33 (4), 758–780. doi: <https://doi.org/10.1016/j.cmet.2021.03.020>
- [9] Vasylenko, Z. V. (2000). *Kharchuvannya i zdorov'ya natsiyi v XXI stolitti*. Mat. MNPk “Strat. rozv. turyst. industr. ta hromad. Kharch”. Kyiv, 208–210.
- [10] Ustynova, A. V., Khvylya, S. I., Belyakin, N. E. et al. (2006). *Spetsializovani m'yasni napivfabrykaty dlya profilaktyky sertsevo-sudynnykh zakhvoryuvan'. Vse pro m'yaso*, 3, 18–21.
- [11] Maughan, R. J., Burke, L. M., Dvorak, J., Larson-Meyer, D. E., Peeling, P., Phillips, S. M. et al. (2018). IOC Consensus Statement: Dietary Supplements and the High-Performance Athlete. *International Journal of Sport Nutrition and Exercise Metabolism*, 28 (2), 104–125. doi: <https://doi.org/10.1123/ijsnem.2018-0020>
- [12] Bazzano, L. A., Thompson, A. M., Tees, M. T., Nguyen, C. H., Winham, D. M. (2011). Non-soy legume consumption lowers cholesterol levels: A meta-analysis of randomized controlled trials. *Nutrition, Metabolism and Cardiovascular Diseases*, 21 (2), 94–103. doi: <https://doi.org/10.1016/j.numecd.2009.08.012>
- [13] Jayathilake, C., Visvanathan, R., Deen, A., Bangamuwage, R., Jayawardana, B. C., Nammi, S., Liyanage, R. (2018). Cowpea: an overview on its nutritional facts and health benefits. *Journal of the Science of Food and Agriculture*, 98 (13), 4793–4806. doi: <https://doi.org/10.1002/jsfa.9074>
- [14] Luna-Vital, D., González de Mejía, E. (2018). Peptides from legumes with antigastrointestinal cancer potential: current evidence for their molecular mechanisms. *Current Opinion in Food Science*, 20, 13–18. doi: <https://doi.org/10.1016/j.cofs.2018.02.012>
- [15] McCrory, M. A., Hamaker, B. R., Lovejoy, J. C., Eichelsdoerfer, P. E. (2010). Pulse Consumption, Satiety, and Weight Management. *Advances in Nutrition*, 1 (1), 17–30. doi: <https://doi.org/10.3945/an.110.1006>
- [16] Miller, V., Mente, A., Dehghan, M., Rangarajan, S., Zhang, X., Swaminathan, S. et al. (2017). Fruit, vegetable, and legume intake, and cardiovascular disease and deaths in 18 countries (PURE): a prospective cohort study. *The Lancet*, 390 (10107), 2037–2049. doi: [https://doi.org/10.1016/s0140-6736\(17\)32253-5](https://doi.org/10.1016/s0140-6736(17)32253-5)
- [17] Lee, S. (2022). Awareness of meat consumption and alternative foods according to sustainable dietary habits. *The Korean Association of Practical Arts Education*, 35 (3), 101–124. doi: <https://doi.org/10.24062/kpae.2022.35.3.101>
- [18] Siegrist, M., Hartmann, C. (2019). Impact of sustainability perception on consumption of organic meat and meat substitutes. *Appetite*, 132, 196–202. doi: <https://doi.org/10.1016/j.appet.2018.09.016>
- [19] Markovych, I., Paska, M., Basarab, I. (2016). Elaboration of production technology of semi-smoked sausages using lentil flour, thyme and juniper. *EUREKA: Life Sciences*, 4, 3–8. doi: <https://doi.org/10.21303/2504-5695.2016.00156>
- [20] Paska, M., Drachuk, U., Masliichuk, O., Vovk, V. (2017). Determination of toxicity of chopped meat-based semi-products in vivo. *EUREKA: Life Sciences*, 5, 26–32. doi: <https://doi.org/10.21303/2504-5695.2017.00429>

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