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USE OF FISH AND FISH PRODUCTS FOR TO ENSURE FOOD SECURITY AND THE TRANSITION TO A BALANCED AND HEALTHY DIET

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According to the Food and Agriculture Organisation of the United Nations (FAO), more than 800 million people around the world were food insecure as of early 2020. The COVID-19 pandemic has only worsened the state of food supply and food security in the global world. The effects of climate change and Russia's military invasion of Ukraine became further challenges to global food security. This confirmed the imperfection and vulnerability of agri-food chains.

However, food security is also a country's ability to ensure access to quality and healthy food for its population. Thus, according to the Rome Declaration on World Food Security, each country must ensure the human right to adequate food and physical access to it, regardless of climate challenges and weather fluctuations, the state and dynamics of production development.

Therefore, when making appropriate decisions, it is necessary to take into account factors such as an increasing global population, climate change affecting agricultural production, inefficient food systems and the growing demand for healthy and safe food.

Since the discovery of nutrients, society has sought to provide advice on how to avoid nutrient deficiencies and protect human health and well-being.

The results of scientific recommendations based on studies of the impact of food on human health confirm the need to move to new consumption models and change the content of the food basket, taking into account the impact of food chains on the environment.

The article considers fish and fish products as a component of the consumer basket of a new model of healthy, high-quality and safe food.

Global fish consumption dynamics show that the trend towards a healthy lifestyle is gaining momentum, leading consumers to increasingly prefer fish and seafood. In addition, fish is better absorbed by the body. Due to the high energy and biological value of fish products, a number of issues related to food security can be addressed today.

Key words: food security, agri-food chains, fish and fish products, public health, model of healthy, high-quality and safe food.

Introduction. Food is an integral part of our life. This is especially important when one of the main tasks facing humanity is ensuring food security.

According to estimates of the Food and Agricultural Organization of the United Nations (FAO), as of the beginning of the COVID-19 pandemic (the beginning of 2020), according to various data, more than 800 million inhabit-

ants of the planet suffered from insufficient food supply. The COVID-19 pandemic has only worsened the state of food security and, as a result, food security in the global world. In 2020, a rapid increase in the scale of hunger was observed, the consequences of which were a further increase in the number of hungry people in the world in 2021. Consequences of climate change, russia's military invasion of the territory of Ukraine became the next challenges for food security. The current situation has confirmed that agri-food chains are imperfect and vulnerable.

2023 was not a year of improvement. Due to the disruption of food chains at all stages (production, logistics, supply, transportation, etc.), pandemic restrictions, rising global food prices, low productivity of food systems in a number of countries around the world, food supply to the global population has become even worse, thereby intensifying the problems of hunger [1–4].

But food security is also the country's ability to provide the population with access to high-quality and useful food. Thus, according to the Rome Declaration on World Food Security [5], every country must ensure the human right to adequate food, physical access to it, regardless of climatic challenges and weather fluctuations, the state and dynamics of production development.

Therefore, factors such as the increase in the global population, climate change affecting the volume of agricultural production, the inefficiency of food systems and the growing demand for healthy and safe food must be taken into account when making relevant decisions.

The results of scientific recommendations made on the basis of research on the impact of food products on human health confirm the need to switch to new consumption models, change the contents of the food basket, taking into account the impact of food chains on the environment.

The right to adequate and affordable food is a human right that most countries today strive to ensure for their citizens. Moreover, for many countries, food is a part of their culture and traditions, a link to their ancestors and their roots. Therefore, it is simply impossible to overestimate the importance of food for human life, health and well-being.

Materials and methods. The research was based on the learning of global reports and statistical data of the Food and Agriculture Organization of the United Nations, statistical data of the State Statistics Service of Ukraine, State Customs Service of Ukraine, national and regional reports.

Results and discussion. Ever since nutrients such as vitamins were discovered in the 1910s and 1950s, society has sought to provide advice on how to avoid deficiencies and protect human health and well-being. Nutrient recommendations were based on an assessment of the biochemical and physiological role of nutrients and the needs of the human body. Such studies were conducted by internationally recognized institutions, including: expert committees of the

countries of Northern Europe (Iceland, Denmark, Finland, Norway, Sweden), the Council on of Food and Nutrition of the National Academy of Sciences of the United States of America (IOM), the British Committee on the Medical Aspects of Food Policy, the World Health Organization (WHO). In recent years, the Food Safety Authority of the European Commission (EFSA) has joined these studies.

Recent studies (IOM, NASEM, EFSA reports) have been based on the use of harmonized criteria established for 22 nutrients (EFSA) and 3 nutrients (IOM/NASEM) for different age groups, from infants 6 months to older adults 70 years old (Figure 1).

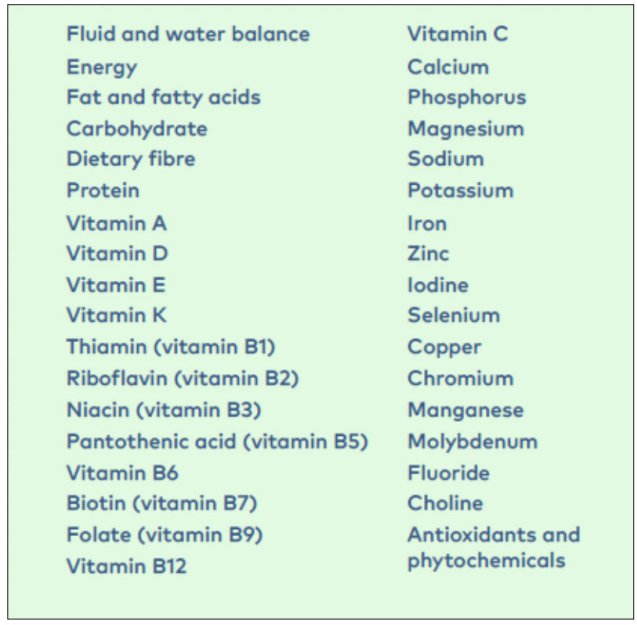

Fig. 1. **Essential nutrients for a healthy diet**

Both excessive and insufficient energy intake in relation to energy needs can lead to negative health consequences in the long term. An active lifestyle is considered desirable for good health. Moreover, the level of activity that corresponds to the population that leads an ordinary lifestyle with sedentary work and some increase in the level of physical activity in free time was considered the most acceptable.

Macronutrients are nutrients that are needed in relatively large amounts to provide energy and support various body functions and overall health. These include proteins, fats, carbohydrates, and fibre, which typically provide about 17, 37, 17, and 8 kJ/g, respectively. Macronutrients can to some extent replace

each other to meet the body's energy needs. Thus, an increase in the proportion of one macronutrient leads to the need to decrease the proportion of other macronutrients.

Macronutrient ranges [6] are defined as intake ranges (expressed as a percentage of total caloric intake) that are associated with a low risk of chronic diseases and also provide adequate intake of essential nutrients. The ranges are also based on sufficient energy intake and physical activity to maintain energy balance. If a person consumes food below or above these ranges, there is a potential for an increased risk of chronic disease, as well as an increased risk of inadequate intake of essential nutrients.

In addition to the ratio of proteins, fats and carbohydrates, the importance of the balance of their subcomponents (for example, unsaturated fatty acids, fibre, amino acids) is obvious.

Partial replacement of saturated fatty acids with poly- and monounsaturated fatty acids is an effective way to reduce cholesterol concentration. A decrease in this indicator is also observed when replacing trans fatty acids with poly- or monounsaturated fatty acids and reduces the risk of cardiovascular diseases (Table 1).

Table 1. **Recommended macronutrient intake ranges for adults**

Total fat		**25–40 E%**
Monounsaturated fat	10–20 E%	
Polyunsaturated fat	5–10 E%	
Saturated fat	<10 E%	
Tras fat	As low as possible	
Carbohydrates		**45–60 E%**
Dietary fiber	≥25–35 g/day	
Added and free sugars	<10 E%	
Proteins		**10–20 E%**

The health effects of dietary carbohydrates depend on the type of carbohydrates and the food source. Total carbohydrate intake in studies of healthy eating patterns associated with reduced chronic disease risk is in the range of 45–60 E%. The range of total carbohydrate intake depends on several factors, such as the quality of dietary sources of carbohydrates and the amount and quality of fatty acids in the diet.

Adequate consumption of dietary fibre reduces the risk of other chronic diseases, such as gastrointestinal tract, cardiovascular, type 2 diabetes, and contributes to reducing the risk of some types of cancer.

In addition, foods rich in fibre help maintain a healthy body weight. Consuming adequate amounts of dietary fibre from a variety of foods is also important for children.

To achieve optimal consumption in a healthy diet, taking into account the specifics and traditions of nutrition in individual countries, a reasonable range of protein intake is 10–20 %. Such protein consumption should adequately meet the needs of essential amino acids.

The optimal level of sodium intake (healthy nutrition) for adults has been set at 1.5 g/day. If daily intake exceeds 2.3 g/day, it is recommended to eliminate it (NASEM, 2019). Such a decrease will contribute to reducing the risk of chronic diseases of the population as a whole.

Food security research in recent decades has shown that foods contribute to overall health rather than simply providing the right amount of essential nutrients. The effects of food on health extend the effects of known essential nutrients, especially when it comes to chronic diseases.

In addition, it is important to note that the studies evaluated the impact of food on the environment. It is noted with a "high degree of certainty" that human activity has definitely caused global warming. Today, the global surface temperature is 1.15 °C higher than in the pre-industrial period. Global greenhouse gas emissions continue to rise due to unsustainable energy use, land use and land-use change, lifestyles, and patterns of consumption and production across regions, as well as between and within countries. Climate change is a threat to human well-being and the health of the planet, livable conditions and a sustainable future. Therefore, rapid and far-reaching transformations are needed in all sectors and systems, including the food chain.

The development of recommendations for healthy and adequate nutrition by leading experts was carried out on the basis of the integration of environmental sustainability and public health. Certain groups of food products have been identified, between which there are few contradictions in terms of healthy and ecologically safe nutrition. These are grains, vegetables, fruits and berries, nuts, red meat and fish, fats, oils, etc. Recommendations for fish and fish products concerned increasing their consumption from sustainably managed stocks. This will contribute both to the improvement of the state of health and to the improvement of the impact on the environment (Table 2).

Fatty fish, nuts, seeds, vegetable oils, and spreads based on vegetable oils high in unsaturated fats should largely replace butter, high-fat meats and meat products.

Analysing the biochemical and physiological indicators of fish products, it should be noted that they contain a large number of chemicals, among which proteins, lipids (fats), water and some minerals are of primary importance.

These substances are the main material from which the tissues and organs of fish are built. In addition to them, fish tissues contain substances that are products of protein and lipid metabolism in the body, as well as other substances that act as regulators of vital processes – vitamins, enzymes and hormones.

Table 2. **Scientific recommendations on the "fish and fish products" food group for adults**

Food group	Health effects of foods on chronic diseases not related to specific nutrients	Health effects of foods based on nutritional adequacy and the effects of specific nutrients	Impact of consumed products on the environment	Recommendations [6]
Fish	Consuming 300–450 grams per week (including at least 200 grams of oily fish per week) reduces the risk of cardiovascular disease, Alzheimer's disease, cognitive decline and premature mortality	Promote the formation of n-3 fatty acids and essential nutrients such as protein, vitamin D, vitamin B 12 and iodine	Fish and seafood from sustainably managed farms and wild stocks should be prioritized, and consumption of species with high environmental impacts should be limited	It is recommended to consume 300–450 grams per week (ready or cooked), of which at least 200 grams per week should be oily fish. It is recommended to consume fish from sustainably managed fish stocks

Carbohydrates (glycogen) are also present in small amounts. In addition, there are substances that perform the role of dyes or pigments and determine the various colours of individual tissues and organs of fish.

According to research, about 60 chemical elements have been found in water bioresources. Among the most important: calcium (1.2–1.5 %), phosphorus (0.6–0.8 %) and other elements, albeit in small quantities.

The molecular chemical composition shows the content of certain chemical compounds in fish that have food, fodder or technical significance. Information about the molecular chemical composition of fish makes it possible to evaluate its nutritional benefits and make a choice about the most rational and useful way of using it.

The data of numerous analyses indicate the presence of significant differences in the chemical composition of fish of various species. In addition, the chemical composition of fish of the same species is not constant and can change depending on the age and sex of the fish, its place of residence and the season (fishing season).

Content and distribution of individual substances in the fish body:

– nitrogen substances – 12–20 %;

– fat – 2–30 %;

– water – 50–84 %;

– mineral substances – 2.0–4.5 %.

Meat is the main edible part of fish, which makes up half of the total body weight on average.

The chemical composition of fish meat is characterized by the content of water, lipids (fats), the total amount of all nitrogenous substances (proteins)

and minerals. For a correct assessment of the nutritional benefits of fish meat, data on the content of complete muscle proteins in it, that is, proteins that are part of muscle fibres and proteins of connective tissue, non-protein nitrogenous compounds of various types, are also important substances related to lipids, as well as vitamins and certain physiologically important mineral elements (potassium, phosphorus, iodine, cobalt, copper, etc.).

The water contained in fish meat is very important, as it participates in biochemical reactions, as well as in physical and chemical processes that occur in fish tissues during various technological processes (freezing, heat treatment, salting, etc.).

In the composition of fish meat, nitrogenous substances are represented mainly by proteins. Along with proteins, non-protein nitrogenous substances belonging to different groups of organic compounds are present in fish tissues.

The ratio of the number of proteins and non-protein nitrogenous substances in the total content of fish meat differs depending on the class – bony or cartilaginous. Bony fish meat contains from 2.0 % to 3.6 % of nitrogen, and most of it (from 80 % to 92 %) is in proteins (protein nitrogen), and the remaining 8–20% is non-protein connections in cartilaginous fish, the total amount of nitrogen in the meat is greater and reaches 3.5–4.0 % (sometimes up to 5 %). But only 60–65 % of all nitrogen is accounted for by proteins, and 35–40 % (sometimes up to 50 %) – by non-protein substances.

Various types of proteins, which are part of fish meat, have different structures, physical-chemical and biological properties, but their elemental composition does not differ much.

Non-protein nitrogenous substances include extractive compounds that are intermediate products of the breakdown of proteins and amino acids. The organoleptic characteristics of finished fish products depend on their quantity and composition.

Lipids are water-insoluble substances that can dissolve only in organic solvents. The main part of fat consists of monoglycerides, diglycerides, triglycerides, which are derivatives of glycerol alcohol and fatty acids.

According to the fat content, fish are divided into 4 groups:

– lean – up to 2 % (cod, hake, whiting);

– medium-fat – 2–8 % (sea bass, horse mackerel, catfish);

– fatty – 8–15 % (mackerel, sardine, sardinella);

– high fat – more than 15 % (herring, halibut, eel).

The composition of fatty acids contained in the fat of different types of fish is not identical and differs greatly. The number of saturated acids in the fat of the meat of various fish is from 17 to 30 %, and unsaturated – 70–83 % of the total weight of all fatty acids. Sea fish fat contains the highest content of certain important acids.

Fish raw materials contain vitamins belonging to two groups:

– water-soluble (soluble in water);

– fat-soluble (soluble in organic solvents).

Vitamins are unevenly distributed in the body of fish. There are much more of them in internal organs than in muscle tissue, especially fat-soluble vitamins, including vitamins A, D, E. The highest content of these vitamins was found in fish liver.

Fish raw materials contain a large group of very important water-soluble vitamins such as: B1 (0.03–0.86 mg%), B2 (0.02–0.36 mg%), B6 (0.10–0.80 mg%), RR (0.40–8.20 mg%), C (0.4–3.2 mg%).

Vitamins are biologically active substances that are important in the normalization of metabolic processes. Combining with specific proteins, vitamins form biocatalysts – enzymes. Being in tissues in rather small quantities, vitamins contribute to the reaction of decomposition and synthesis of amino acids, proteins, carbohydrates, and nucleic acids.

Fish is a rich source of minerals. Their content in muscle tissue is, as a rule, stable and ranges from 1 % to 3 %. Mineral substances included in fish raw materials include macro- (from tenths to hundredths of a percent) and microelements (less than 0.01 %).

Macronutrients include sodium, potassium (90–100 mg%), calcium, phosphorus (up to 700 mg%), magnesium (25–70 mg%). Microelements include iron, copper, manganese, zinc, mercury, lead, cadmium and others. Microelements are part of biologically active substances, such as enzymes, vitamins, hormones.

The content of mineral elements in the muscle and other tissues of fish depends on the composition and concentration of salt in the water environment. The meat of sea fish contains much more mineral elements than the meat of freshwater fish. Another difference between marine and freshwater fish is the complete absence or small amount of iodine and bromine in the meat of the latter.

Potassium, sodium, phosphorus, sulfur, chlorine, calcium, magnesium, iron, zinc, copper, as a rule, are present in the meat of all types of fish, but with different quantitative content.

Carbohydrates contained in small amounts in fish muscles in the form of animal starch (glycogen) are a source of energy.

Fish tissues contain a large number of enzymes in small quantities, which act as biological catalysts for the chemical transformation of substances in protein, lipid and carbohydrate metabolism, which is the basis of life processes. By their chemical nature, enzymes are proteins (simple and complex).

The nutritional value of fish, taking into account the entire list of nutrients included in its composition, is extremely high. The value of fish products for

high-quality and healthy nutrition is determined, first of all, by the presence in its composition of a large number of complete proteins, as the basis of vital amino acids, as well as lipids, vitamins, macro- and microelements.

Proteins have a high biological value for fish products.

The biological value of lipids is assessed by their fatty acid composition, especially the content of polyunsaturated fatty acids, which play an important role in regulating cardiovascular activity.

Nitrogenous substances present in fish meat play an important role in the process of gastrointestinal digestion.

Vitamins present in fish are used by the human body as a regulator of metabolic processes. Group A and B vitamins are especially important, as they are almost absent in meat and vegetable foods.

Mineral substances are important for the condition of bones, nerves, muscle and covering tissue of a person. Their insufficient content in food causes serious metabolic disorders.

When transitioning to new models of high-quality and useful nutrition, when evaluating the nutritional value of fish and fish products, it is also necessary to note its high energy value (EV) [7]. The energy value is characterized by the total amount of energy released during the biological oxidation of nutrients contained in 100 g. product and is used to support the physiological functions of the body.

It is known that when burning 1 g of proteins 4.0 kcal (16.7 kJ) is released, 1 g of fats – 9 kcal (37.7 kJ), 1 g of absorbed carbohydrates – 3.75 kcal (15.7 kJ) of energy. According to the principles of rational nutrition, the daily energy requirement of an adult is 2800-3000 kcal. Of course, the amount of energy needed for consumption depends on a person's age, sex, physiology, condition, place of residence, etc.

Depending on the energy value, fish and fish products are conventionally divided into three groups, presented in Table 3.

Table 3. **Classification of fish and fish products based on energy value**

Name of group and EC, kcal/100 g	Product group
High in calories, 200–300 and more	Fish: sea bass, saury, Atlantic fat herring, ivory, mackerel, tuna. Fish products: Pacific herring, salmon, tuna, salted hamsa, sturgeon caviar, cod liver, Atlantic mackerel, etc. [7]
Medium calorie, 100–199	Fish: catfish, abalone, pollock, halibut, halibut, carp, Pacific herring, Atlantic mackerel Fish products: pollock caviar; hot-smoked flounder, cold-smoked Atlantic mackerel, dried sturgeon, etc. Non-fish products of water fishing: squid meat [7]
Low in calories, 30–90	Fish: Azov-Black Sea flounder, crucian carp, icefish, bream, spring marble capelin, fragile Azov carp, pike perch, cod, etc. Fish products: canned tuna, crabs and shrimps, etc. Non-fishery products: seaweed, mussels, etc. [7]

The energy value of fish and fish products varies depending on the method of processing and depends on its composition, content and food additives.

Digestibility of food products is an important indicator that characterizes the extent to which the product (its part or the product as a whole) is used by the body. With mixed nutrition, the digestibility of various food substances is accepted at the following levels: proteins – 84.5 %, fats – 94 %, carbohydrates – 95.5 %. For fish products, the rate of assimilation by the human body is 85–90 % for proteins, 84–96 % for fats.

Such a high level of digestibility ensures the normal functioning of the human body and determines the completeness of this product.

According to the materials of the Food and Agricultural Organization of the United Nations (FAO, 2022), today the world consumes six times more products from aquatic biological resources than almost 60 years ago. According to observations conducted since 1961, the world consumption of fish products has increased from 28 million tons to almost 176 million tons (2022) [8]. Moreover, 72 % of this volume was in Asia, where 60 % of the world's population lived. For comparison, in 1961, Asia consumed 48 % of the fish products available for consumption. For Europe and the USA, this indicator decreased from 32 % and 9 % to 10 % and 5 %, respectively, during the same period.

The increase in the consumption of products from aquatic bioresources in Asian countries was the result of a number of factors. In 1993, Asia took first place in the world in the production of products from aquatic biological resources thanks to the development of aquaculture. In the same period, significant economic development of the region, growth of population incomes, increased migration of the rural population to urban agglomerations, access to food products from aquatic bioresources took place. The reorientation of the export market to the domestic market contributed to increasing access to products from aquatic biological resources, expanding their range and increasing consumption.

At the beginning of 1961, Japan, the USSR, China, the United States, and Great Britain accounted for fifty percent of the total consumption of fish products. In 2022, China, Indonesia, India, the USA and Japan (the countries with the largest consumption) accounted for 60 % of the total consumption of fish products, with China accounting for 37 %.

Since the 60s of the last century, the consumption of food products from aquatic bioresources per capita in the world has been constantly increasing: in the 60s – 9.9 kg; 1970s – 11.4 kg; in the 1980s – 12.5 kg; in the 1990s – 14.4 kg; in the 2000s – 17.0 kg; in the 2010s – 19.6 kg. And although in 2019 consumption reached a record level of 20.5 kg, the next three years saw a slight decrease to 20.2 kg. The main reason for this was the COVID-19 pandemic and its consequences.

In the period 1961–2022, consumption of food products from aquatic bioresources per capita increased in almost all countries except Japan, although the dynamics of growth differed in different countries. In different countries, not only different rates of growth of consumption of food products from aquatic bioresources were noted, but also differences in the consumption of these products per capita. This is explained by different physical availability of these products and other types of food, differences in prices and income levels, different levels of consciousness about nutrition, as well as different food traditions, etc.

In 2022, FAO estimated the consumption of food products from aquatic bioresources per capita in 227 countries. In 133 of them, it did not reach the world average level, and in 94 it exceeded this level. Moreover, the world average level of consumption per capita was 20.2 kg. The average in low-income countries was 5.4 kg, in lower-middle-income countries 15.2 kg, in upper-middle-income countries 28.1 kg, and in high-income countries 26.5 kg.

The largest amount of food products from aquatic bioresources per capita in 2022 was consumed in Asia – 24.5 kg, 23.1 kg was consumed in Oceania, 21.4 kg in Europe, 14.5 kg in North and South America, and 10.1 kg in Africa.

The fairly low consumption volumes in African countries are explained by the high rates of population growth, which in most countries outpace the rate of increase in the production of industrial fishing products, the small scale of the aquaculture sector, which limits the opportunities for increasing production in the near future, and the unsatisfactory state of transport and market infrastructure. According to FAO forecasts, the consumption of fish products per capita in Africa is expected to decrease in the next 10 years. Considering the high prevalence of malnutrition and hunger, as well as the important role of food products from aquatic biological resources as a source of proteins, this can worsen the state of food security in the region [9].

Nutrition experts recommend one or two servings of fish per week, as it is a valuable source of protein, vitamin D and iodine. Sea fish with a high content of fats and omega-3 fatty acids is especially useful.

The demand for fish continues to increase, but ensuring a sustainable fish supply is a challenge that requires an integrated approach. The development of aquaculture and the consumption of local fish, together with strategies for effective management of fish stocks, can help provide fish to the population, preserve biodiversity and preserve the value of the oceans for future generations.

In most developed countries, they realized that the resource of the world's oceans is not limitless and that this fishery needs clear regulation and control.

In Ukraine, over the past five years, there has been a constant fluctuation in the per capita consumption of fish products. And if before the pandemic it was 11.1 kg/year, and in 2020 – 12.4 kg/year, today instead of the world average consumption of 20.2 kg/year per person, we have only 9.9 kg/year, which is less

even than in African countries. In addition, over the past 25 years, Ukraine has reduced the extraction and production of its fish products by 56 times.

Unfortunately, the culture of fish consumption in Ukraine in the pre-war period was still at the stage of formation. Ukrainians consumed both imported fish and their own fish.

Among the TOP exporters of fish to Ukraine were Norway, Iceland and the USA.

Virtually all fish imported to Ukraine were not subject to any duties, except for the standard VAT for all imports, and there were no additional barriers that could artificially increase the price of the product for the final consumer.

The situation with local Ukrainian products was more complicated, most producers worked outside the legal field. Unfortunately, first the annexation of Crimea (2014), then the COVID-19 pandemic and the full-scale military invasion of russia in Ukraine added negative effects on the development of the industry and the state of the consumer market.

Conclusion. The global dynamics of fish consumption indicates that the trend of a healthy lifestyle is gaining momentum, as a result of which consumers increasingly prefer fish and seafood. In addition, fish is better absorbed by the body. Thanks to the high energy and biological value of fish products, a number of issues related to food security can be solved today.

Global growth in fish consumption is driven by the development of aquaculture. Fish farming technologies have taken a step forward. According to experts in the field of aquatic bioresources and aquaculture, by 2030, 70 % of all fish will be grown on farms in closed water supply systems. And today, when the world society is looking for possible ways to improve food security by changing the content of the food basket, redistributing available food resources, and introducing new innovative technologies, aquaculture can meet the ever-growing demand for fish and seafood, and the wild fish segment will become a premium, rare commodity.

The added value of fish products comes from processing and processing of fish. The main global trend, which is gradually becoming a standard, is to make products as convenient as possible for the end consumer and save time, minimising the effort required to prepare them.

In the future, these trends will determine the development of the Ukrainian fish market. After all, solvent consumers are already willing to pay more today, choosing a high-quality and practically ready-to-eat healthy product.

ВИКОРИСТАННЯ РИБИ ТА РИБНОЇ ПРОДУКЦІЇ З МЕТОЮ ЗАБЕЗПЕЧЕННЯ ПРОДОВОЛЬЧОЇ БЕЗПЕКИ ТА ПЕРЕХОДУ НА ЗБАЛАНСОВАНЕ ТА ЗДОРОВЕ ХАРЧУВАННЯ

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За оцінками Продовольчої та сільськогосподарської організації ООН (FAO), станом на початок 2020 року понад 800 мільйонів жителів планети страждали від нестачі продовольства. Пандемія COVID-19 лише погіршила стан продовольчого забезпечення та продовольчої безпеки в глобальному світі. Наступними викликами глобальній продовольчій безпеці стали наслідки зміни клімату та військове вторгнення росії в Україну. Це підтвердило недосконаліть і вразливість агропродовольчих ланцюгів.

Але продовольча безпека – це ще й здатність країни забезпечити доступ населення до якісних і корисних продуктів харчування. Так, відповідно до Римської декларації про всесвітню продовольчу безпеку, кожна країна повинна забезпечити право людини на достатнє харчування, фізичний доступ до нього, незалежно від кліматичних викликів і погодних коливань, стану та динаміки розвитку виробництва.

Тому при прийнятті відповідних рішень необхідно враховувати такі фактори, як збільшення населення планети, зміна клімату, що впливає на обсяг сільськогосподарського виробництва, неефективність продовольчих систем і зростаючий попит на здорову та безпечну їжу.

З тих пір, як були відкриті поживні речовини, суспільство намагалося надати поради щодо того, як уникнути дефіциту поживних речовин і захистити здоров'я та благополуччя людей.

Результати наукових рекомендацій, складених на основі досліджень впливу харчових продуктів на здоров'я людини, підтверджують необхідність переходу до нових моделей споживання, зміни вмісту продуктового кошика з урахуванням впливу харчових ланцюгів на навколишнє середовище.

У статті риба та рибні продукти розглядаються як складова споживчого кошика нової моделі корисного, якісного та безпечного харчування.

Світова динаміка споживання риби свідчить про те, що тенденція до здорового способу життя набирає обертів, внаслідок чого споживачі все більше віддають перевагу рибі та морепродуктам. Крім того, риба краще засвоюється організмом. Завдяки високій енергетичній та біологічній цінності рибних продуктів сьогодні можна вирішити низку питань, пов'язаних із забезпеченням продовольчої безпеки.

Ключові слова: продовольча безпека, агропродовольчі ланцюги, риба та рибні продукти, охорона здоров'я людей, модель корисного, якісного та безпечного харчування.

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