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THE CURRENT STATE OF EXTRACTING AND CONSUMING AQUATIC BIORESOURCES IN UKRAINE

Burhaz M. I. – Ph.D. in Biological Sciences, Associate Professor,

Matviienko T. I. – Senior Lecturer,

Odesa State Environmental University,

marinaburgaz14@gmail.com, tatyana.matviienko@gmail.com

Aquatic biological resources and their effective using form the basis of the sustainable development of fish farming and aquaculture in each country. It is an important resource of food security, which will determine its state in the near future, taking into account the latest global trends.

In recent years, the trend towards a decrease in catching aquatic biological resources, a decrease in the producing its own fish products, a decrease in the level of consumption of fish products per capita with a simultaneous increase in the import dependence of the market, which indicates the absence of a system of the sustainable development and the insufficient financial support for the fishing industry, has been observed in Ukraine. But, namely fisheries, as a complete complex, plays a very important role in the economy of Ukraine.

The purpose of the work was to find out the current state of fishing and extracting aquatic bioresources and to analyze the consumption of fish and fish products by Ukrainians.

The dynamics of extracting aquatic bioresources in general and in the internal water bodies, the value indicators of the aquaculture development, the funds of food consumption by Ukrainians for 2021 were analyzed on the basis of specialized literature, regulatory and legal documents related to aquaculture and, in particular, fish farming, statistical data and scientific works of the scientists dedicated to the development of the fishing industry of Ukraine.

The structures of the sea and freshwater fish catch volumes by main species for 2021 were studied, and the changes that occurred in the cost structure of the caught sea and freshwater fish were analyzed.

According to the data on consuming staple foods by the population of Ukraine for 2021, it was established that the consumption of fish and fish products is in the last place. It is due to the low purchasing power of the population on account of rising fish prices and falling incomes of most Ukrainians.

As a result of the conducted research, it was established that the regulation of the fishing industry of Ukraine is insufficiently effective and creates the additional regulatory barriers for the business entities, leads to unequal access to the common limited resource and to irrational using the water bodies and aquatic bioresources.

Keywords: aquatic bioresources, catch, extraction, aquaculture, fish consumption, sea fish, freshwater fish.

Introduction. Aquatic bioresources and their effective using form the basis of the sustainable development of fish farming and aquaculture in each country. It is an important resource of food security, which will determine its state in the near future, taking into account the latest global trends.

Aquatic bioresources (aquatic biological resources according to the Law of Ukraine “On Fish Farming, Industrial Fishing and Protection of Aquatic Biological Resources” dated 07.08.2011 No. 3677-VI) is a set of aquatic organisms (hydrobionts) whose life is impossible without staying (being) in water. Aquatic biological resources include freshwater, marine, anadromous and catadromous fish in all stages of their development, roundmouths, aquatic invertebrates, including molluscs, crustaceans, worms, echinoderms, sponges, gastropods, terrestrial invertebrates in the aquatic stage of development, algae and other aquatic plants [1].

In recent years, the trend towards a decrease in catching aquatic biological resources, a decrease in the producing its own fish products, a decrease in the level of consuming fish products per capita with a simultaneous increase in the import dependence of the market, which indicates the absence of a system of the sustainable development and the insufficient financial support for the fishing industry, has been observed in Ukraine. But, namely fisheries, as a complete complex, plays a very important role in the economy of Ukraine.

The purpose of the work was to find out the current state of fishing and extracting aquatic bioresources and to analyze the consumption of fish and fish products by Ukrainians.

To achieve the goal, the following tasks were set:

- 1) to analyze the dynamics of extracting aquatic bioresources in general and in the internal water bodies;
- 2) to determine the amount of fish caught in the region;
- 3) to analyze the value indicators of the aquaculture development;
- 4) to establish the main promising directions for the development of the intensive fishery industry to provide the domestic consumer market with the competitive fishery products.

Research materials and methods. Specialized literature, regulatory and legal documents related to aquaculture and, in particular, fish farming, statistical data and scientific works of scientists dedicated to the development of the fishing industry of Ukraine were used for the research. All data for the analysis, which were used in the research process, were statistically processed.

Results and their discussion. Fishing has traditionally played an important role in ensuring food security in many countries of the world and for supporting the population employment and well-being, while fishing itself forms a fairly significant share of cash receipts and income, including taxes and fees [1].

In recent years, in connection with a significant decrease in the fish stocks in the world ocean, and, accordingly, in the volume of its catching, the development of various forms of aquaculture is becoming more and more widespread. Fishing is one of the few branches of the domestic economy, which ensures not only the food security of the state, but also allows to diversify agrobusiness and to increase the profitability of its management with relatively small initial investments and a guaranteed sales market.

Unlike animal husbandry, fishing industry, due to its specificity, could quickly and significantly increase the country's food resources as a result of the increase in the number and improvement of the material and technical base of the fishing fleet. But, today, the extraction of aquatic bioresources is constantly decreasing and there are many favorable reasons for this, primarily related to the annexation of the Crimean Peninsula by the Russian Federation, as well as the temporary occupation of the certain territories of Ukraine. In addition, the factors that led to decreasing the volume of extracting the aquatic bioresources are insufficient stocking of reservoirs; the inadequate state of the stocks of the main commercial fish species in the Azov-Black Sea basin; the insufficient number of fishing vessels, their unsatisfactory technical conditions, etc. Significant decreasing the volumes of catching the aquatic bioresources in the inland reservoirs and the Azov and Black seas negatively affects the economic potential and the international dependence of the country on fish imports, and most importantly, it does not contribute to providing the domestic market of Ukraine with the important protein products [2–4].

According to the data of the State Statistics Committee of Ukraine [5], in 2021 only 69.9 thousand tons of aquatic bioresources were obtained, and almost 33% of them were from the internal reservoirs (Table 1).

The fish catch volume in the inland water bodies decreased by 2.6% compared to 2020. In particular, in 2021, 41.8 thousand tons of fish and 28.1 thousand tons of other water resources were caught, and 22.7 thousand tons of fish and 0.057 thousand tons of other water resources were caught in the inland water bodies.

With a loss of a part of the marine fishing fleet in 2013, fishing in the economic zones of other states decreased by almost 80%.

In the structure of extracting the aquatic bioresources for 2021, it should be noted that 60% is fish, the rest is crustaceans and molluscs and other aquatic bioresources. More than 50% of the extracted water bioresources total volume is in two regions – the Mykolaiv region and the Odesa region. Fishing is the least developed in the western and northern regions, where there are no suitable natural conditions for accessing to the large water bodies (seas, large rivers, reservoirs, lakes), which are in the southern and central regions (Fig. 1).

Table 1. The extraction of aquatic bioresources in the major fishing areas in 2021 [5]

	Volume of extracted aquatic bioresources, tonnes		Average price of extracted aquatic bioresources, UAH per 1 tonne	
	2021	2021 у% до / % to 2020	2021	2021 у% до / % to 2020
Aquatic bioresources				
<i>All fishing areas</i>	69872,9	91,3	15760,1	101,0
<i>Aquaculture</i>	11100,7	93,0	41076,5	114,2
<i>Inland waters objects</i>	22663,0	97,3	15217,8	102,1
<i>Azov Sea</i>	к/с	к/с	к/с	к/с
<i>Black Sea</i>	9971,4	82,8	7802,0	101,0
<i>Atlantic, Antarctic</i>	к/с	к/с	к/с	к/с
Fish				
<i>All fishing areas</i>	41816,1	86,7	20922,2	104,9
<i>Aquaculture</i>	11097,3	93,1	40829,9	114,3
<i>Inland waters objects</i>	22606,4	97,4	15154,5	101,7
<i>Azov Sea</i>	к/с	к/с	к/с	к/с
<i>Black Sea</i>	4165,9	89,7	10429,4	108,6
<i>Atlantic, Antarctic</i>	к/с	к/с	к/с	к/с
Other aquatic bioresources				
<i>All fishing areas</i>	28056,8	99,2	8066,6	98,6
<i>Aquaculture</i>	3,4	48,8	852051,6	179,3
<i>Inland waters objects</i>	56,6	67,9	40535,0	239,8
<i>Azov Sea</i>	к/с	к/с	к/с	к/с
<i>Black Sea</i>	5805,5	78,5	5916,7	90,4
<i>Atlantic, Antarctic</i>	к/с	к/с	к/с	к/с

¹ Data exclude the temporarily occupied territory of the Autonomous Republic of Crimea, the city of Sevastopol and a part of temporarily occupied territories in the Donetsk and Luhansk regions. Symbol (c) – data are not published in order to ensure compliance with the requirements of the Law of Ukraine “On the State Statistics” regarding confidentiality of statistical information.

In Ukraine, the share of catching freshwater and marine fish in 2021 was 80% and 20%, respectively. After considering, in a section, the production of the aquatic bioresources by fishing areas, it can be seen that aquaculture accounts for 11.1 thousand tons, the extraction in the inland water bodies accounts for 22.7 thousand tons, the Black Sea area accounts for 9.97 thousand tons, other data are not made public in order to ensure the compliance with the requirements of the Law of Ukraine «On State Statistics» regarding the statistical information confidentiality. The Odesa, Cherkasy, and Dnipropetrovsk regions accounted for the largest catch share in the internal facilities and amounted to 4.7 thousand tons, 4.1 thousand tons, and 3.3 thousand tons in 2021, respectively (Fig. 2), but the largest catch share in aquaculture is only in the Cherkasy region and amounted to 2.8 thousand tons.

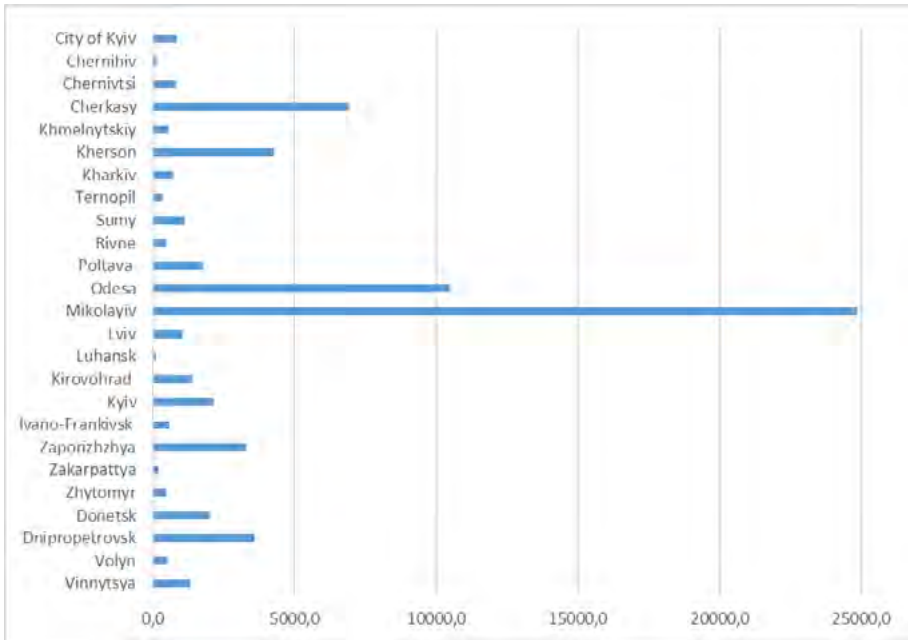


Fig. 1. The extraction of the aquatic bioresources by species and regions (According to the State Statistical Service of Ukraine [5])

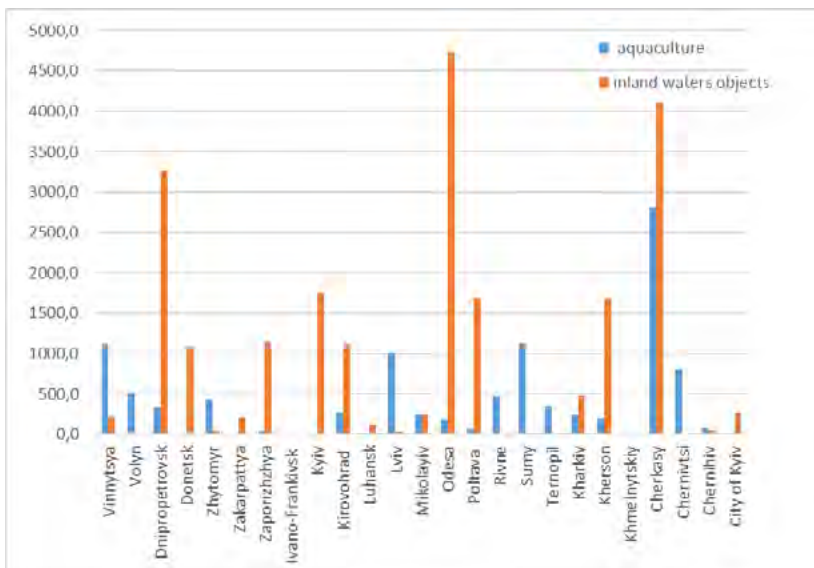


Fig. 2. The extraction of the aquatic bioresources by major fishing areas and regions in 2021 (According to the State Statistical Service of Ukraine [5])

The level of fish and fish products supplying for the domestic consumer needs based on own production is only 25%, or 2 kg per inhabitant per year, which is definitely insufficient and does not meet scientifically based norms. In order to ensure the domestic fish catch for the Ukrainian population consumer needs, it is necessary to increase the volume of cultivating and catching by 10 times, which is impossible without rationalal using the water fund facilities and developing the high-tech aquaculture on this basis [4].

49% of all marine fish caught by fishing enterprises in 2021 is sprat (Black Sea-Caspian kilka) and 29% is sea goby (Fig. 3). In general, the amount of the sea and ocean fish caught in 2021 decreased by 13% compared to 2020 and amounted to only 8.2 thousand tons for the amount of UAH 84.7 million.

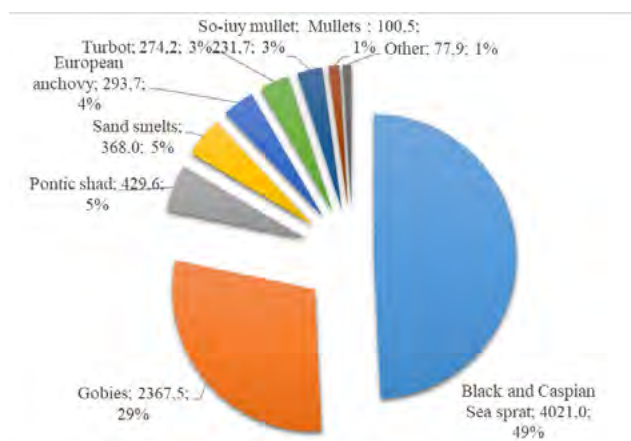


Fig. 3. The structure of the oceanic and sea fish catch by the main species, tons, 2021 (According to the State Statistical Service of Ukraine [5])

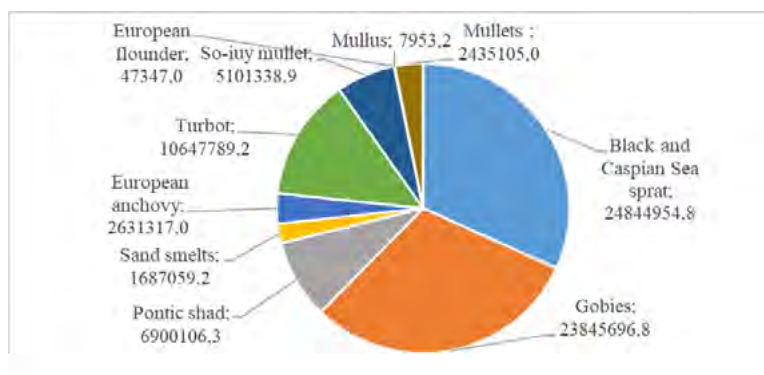


Fig. 4. The structure of the caught sea and oceanic fish value by species, 2021 (According to the State Statistical Service of Ukraine [5])

In addition, there have been changes in the cost structure of the caught sea and ocean fish. More than 75% of the total value of the sea and oceanic fish caught is sprat (Black Sea-Caspian kilka), goby and kalkan flounder. The total value of the caught sprat was UAH 24.8 million, or 31% of the value of the sea fish caught, goby was UAH 23.8 million. (30%), UAH 10.6 million. (14%) (Fig. 4).

In 2021, there was a slight decrease in the volume of the freshwater fish catch by about 2%. At the same time, the largest share of the catch volume was made up of freshwater crucian carp, large carp and carp, which is quite a typical phenomenon for grazing aquaculture, which has come to prevail in a significant

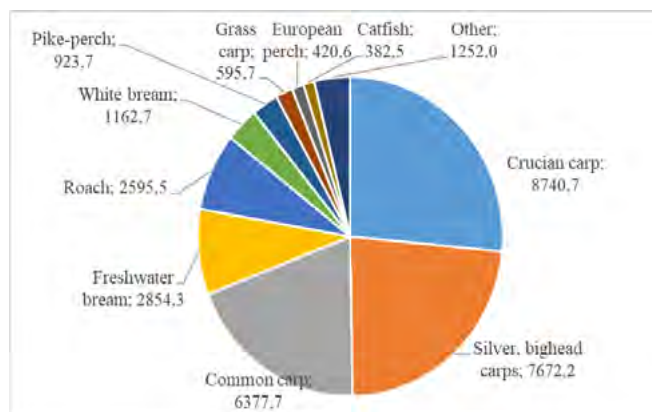


Fig. 5. The structure of the freshwater fish catch by species, 2021, vol.
(According to the State Statistical Service of Ukraine [5])

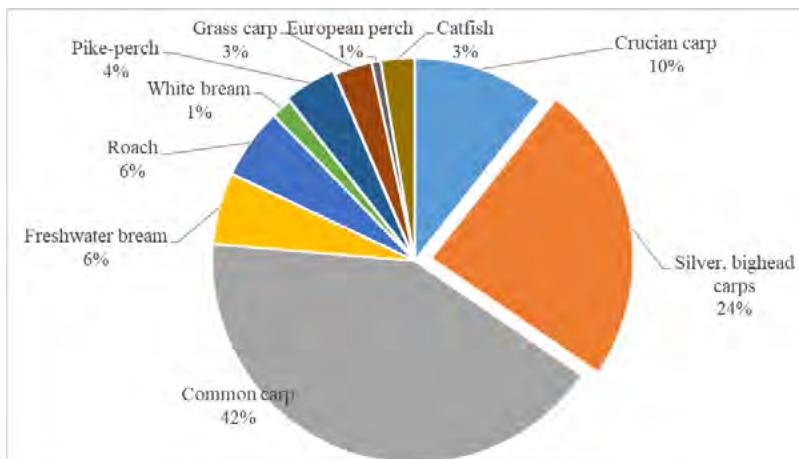


Fig. 6. The structure of the caught freshwater fish value by the main species, 2021
(According to the State Statistical Service of Ukraine [5])

part of the Ukrainian fishing enterprises. 8.7 thousand tons of freshwater crucian carp were caught in 2021, it is 26.5% of the gross volume of the caught freshwater fish, large carp was 7.7 thousand tons (23%), carp was 6.4 thousand tons. (19%) (Fig. 5).

Taking into account the inflationary increase in selling prices for fish, the value of caught commercial freshwater fish increased by a third and amounted to UAH 781 million, where 42% was accounted for by carp (Fig. 6).

Nowadays Ukraine imports about 90% of fish. This situation arose due to the lack of a dedicated fleet, processing industry, quotas in the neutral waters and poaching. In addition, the cost price of the Ukrainian fish is higher than the imported fish. Therefore, the products lose their competitiveness [6].

In general, Ukraine imports fish and seafood from 60 countries.

Norway remains the traditional leader in importing fish to Ukraine. Iceland is in the second place, and the USA is in the third place. They are followed by Estonia, Latvia, Spain, Canada, Great Britain, China, Vietnam and Argentina.

The range of fish in Ukraine is represented by both domestic and imported products:

- Domestic products: carp, pike, capelin, zander, mackerel, several.
- Imported products: flounder, perch, pangasius, salmon, butterfish, hake, pollack, capelin, notothenia, herring, mackerel, cod, tuna, tilapia (sole), sea trout, hake, etc.

Considering imports by the fish species, it should be noted that oceanic herring accounts for 56%; mackerel – 13%; sardine species – 10%; pollock – 5%. The other 16% of import volume is occupied by such types of fish as: salmon, herring, capelin, whiting, hake and others. Atlantic herring and mackerel are imported to Ukraine from Norway. Sardines are also imported from Norway, USA, Canada, Spain and Argentina. Sprat is mostly Baltic. Pollack and salmon are imported from Russia and Norway. The main importers of delicate species of fish are: France, Italy and China [6].

Currently, the most popular types of domestic products include carp, pike, several, pilengas. The most popular sea fish caught in Ukraine is mackerel – 15.5% of the fish total amount, bullhead – 13.3%, turbot – 8.4%, krill – 10.1%. The leaders among the river fish are carp (10.6%), walleye (13.6%) and crucian carp (5.1%) [6].

The annual fund of fish and fish products consumption in Ukraine for the period from 2000 to 2021 showed that it is at an almost stable level. Thus, in 2021, fish consumption per person amounted to 13.2 kg, which is 35% more than in 2015 and 6% more than in 2020 (Fig. 7).

Having considered the fund of consuming the basic food products by the population of Ukraine for 2021 (Fig. 8), it should be noted that the leader is consuming eggs (11.26 thousand tons), while consuming fish and fish products is

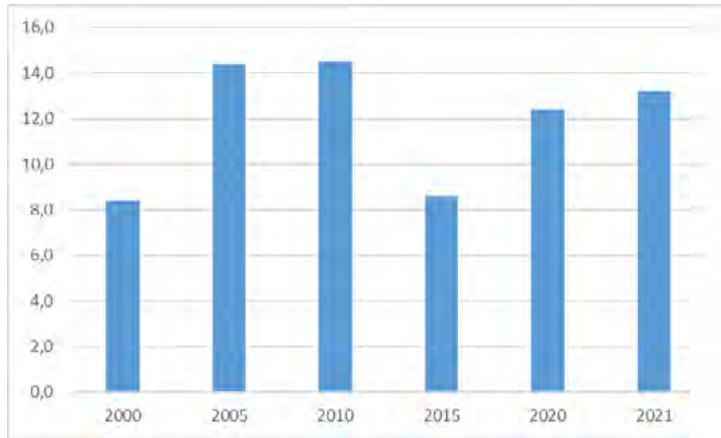


Fig. 7. The consumption of fish and fish products in Ukraine, per capita in year; kilograms (According to the State Statistical Service of Ukraine [5])

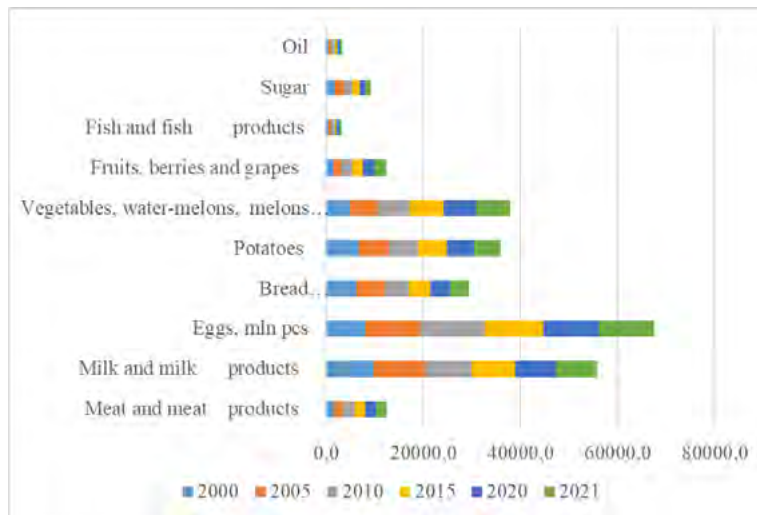


Fig. 8. The consumption of basic food products by the population of Ukraine, thousands of tons (According to the State Statistical Service of Ukraine [5])

in the last place and is 0.55 thousand tons. It is due to the low purchasing power of the population due to rising fish prices and falling incomes of most Ukrainians.

But comparing the consumption of fish and fish products by Ukrainians for the period from 2000 to 2021, it should be noted that there has been an increase in recent years, although not significant (Fig. 9). The fish consumption fund includes fresh fish, as well as salted, smoked fish, canned fish and other types of fish products in physical weight per fish.

Analyzing the consumption of basic food products per person per year, for the period from 2000–2021, it was established that eggs and dairy products are the main products, and fish and fish products again occupy the last place (Fig. 10).

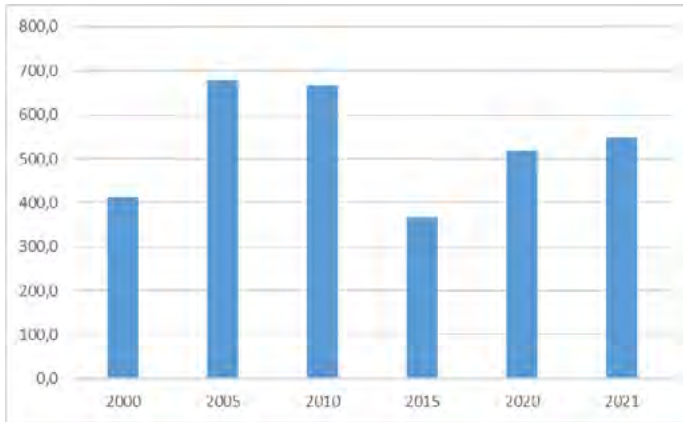


Fig. 9. The consumption of fish and fish products by the population of Ukraine, thousands of tons (According to the State Statistical Service of Ukraine [5])

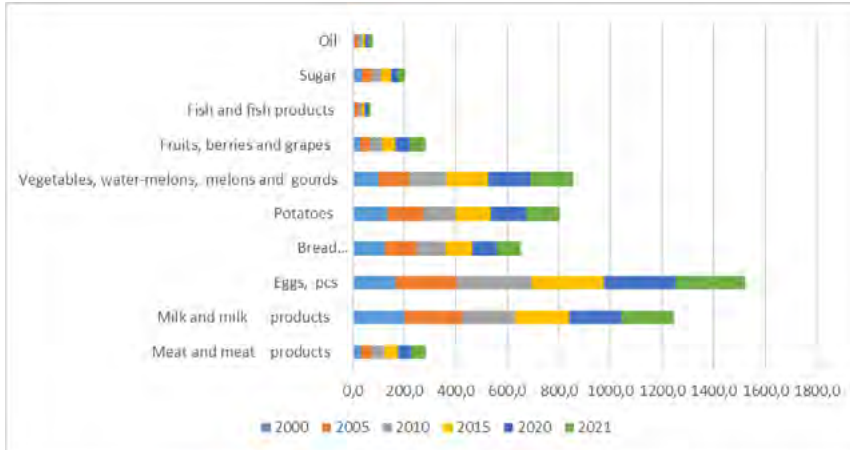


Fig. 10. The consumption of basic food products per person per year; kg (According to the State Statistical Service of Ukraine [5])

So, in 2021, the consumption of fish and fish products per person per year was 13.2 kg, and, for example, meat consumption was 53 kg, which is 75% more.

After considering the consumption of food products in the individual countries in 2019 (Fig. 11), the three leaders in consuming fish and fish products were identified – China, Japan and Spain, respectively: 51 kg, 47 kg and 42 kg

per year per person. In relation to consuming meat, consuming fish and fish products was: China – 73%, Japan – 87%, Spain – 39%, and in Ukraine only 25%.

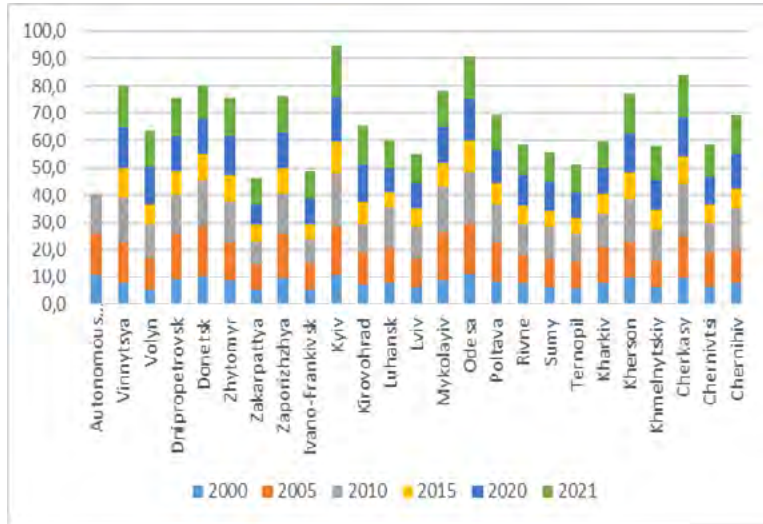


Fig. 11. The consumption of fish and fish products, per capita in year; kilograms

Analysis of consuming fish and fish products per person per year, in the period from 2000 till 2021 by the regions of Ukraine showed that the maximum consumption was recorded in two regions – the Kyiv and Odesa regions, amounted to 19.1 kg and 15.6 kg respectively in 2021 (Fig. 12), but after comparing consumption by the regions, the leaders became the Kyiv, Donetsk, and Dnipropetrovsk regions – 90.8 thousand tons, 50.6 thousand tons, and 43.5 thousand tons, respectively, in 2021 (Table 2) [5].

So, it should be noted that Ukrainians prefer imported products to domestic products and consume very little fish and fish products.

The Ukrainian import-dependent fish and fish products market negatively affects food security. The problem lies in the structure of fish consumption by the population of the country, in which the share of freshwater fish grown by the domestic farms does not exceed 12%, and sea fish is not fully covered by the fishing fleet in the marine economic zones of Ukraine and other countries, so it is imported to meet the domestic demand [7–8].

The problem of aquaculture development in Ukraine is fundamental and lies in the structure of fish consumption by the population, which is a consequence of the consumption culture itself. Therefore, changing the culture of the consumption in favor of freshwater fish, which are grown by the Ukrainian enterprises and caught in the inland water bodies, can change the balance of fish and fish products and contribute to the reduction of imports, the absolute

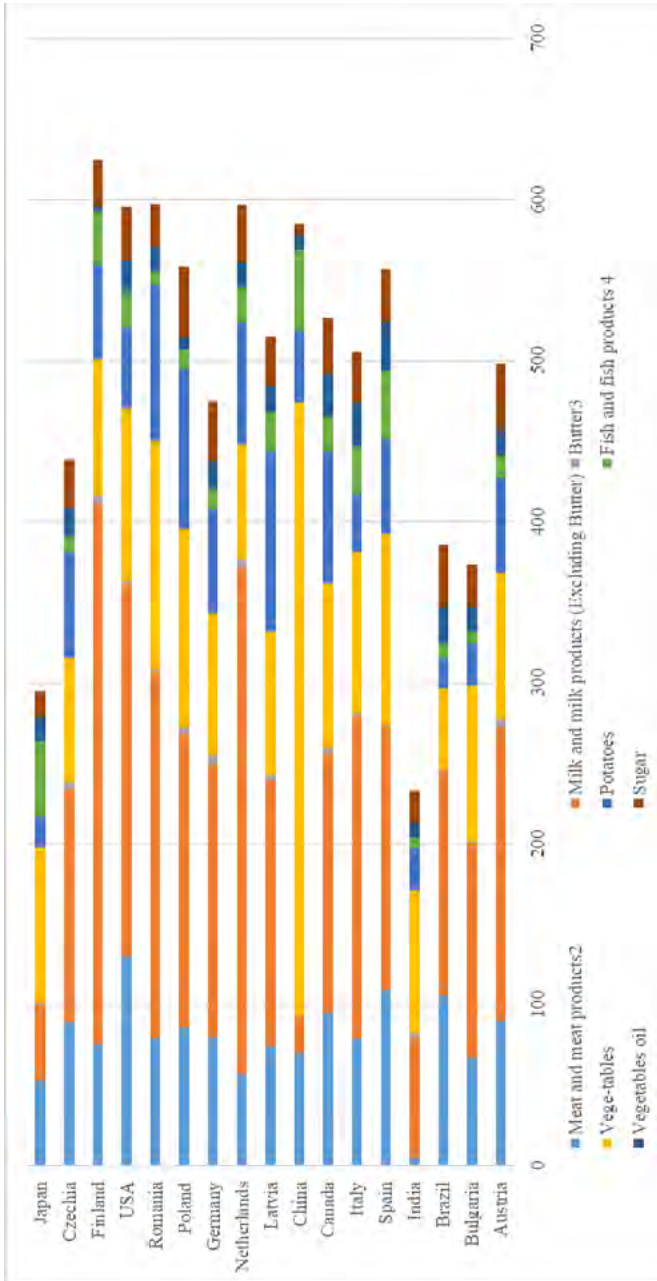


Fig. 12. Food consumption in the individual countries in 2019, per person per year; kg

¹ It is used here the statistical materials of the World Food and Agriculture Organization of the United Nations – FAO are used, in particular, the data are posted on the WEB website of this organization at: [http:// www.fao.org](http://www.fao.org).

² Including subproducts and row fat.

³ In physical weight, without calculation of milk.

⁴ Including seafood and other aquatic products.

Table 2. Fund of consuming fish and fish products, thousands tons

Regions	2000	2005	2010	2015	2020	2021
Autonomous Republic of Crimea	26,4	36,2	33,7
Vinnitsya	13,8	25,7	27,0	17,3	22,6	23,2
Volyn	5,5	12,0	12,7	8,0	13,9	13,5
Dnipropetrovsk	32,2	57,8	48,2	28,3	41,1	43,5
Donetsk	51,3	81,8	76,5	42,0	51,5	50,6
Zhytomyr	12,1	18,9	18,8	12,5	17,3	16,4
Zakarpattya	6,3	11,6	11,0	7,2	10,0	12,1
Zaporizhzhya	18,3	30,1	27,1	16,4	22,1	22,2
Ivano-Frankivsk	7,3	13,9	12,0	7,3	12,8	13,4
Kyiv	48,3	77,0	87,5	55,4	76,5	90,8
Kirovohrad	8,4	12,3	10,7	8,1	12,4	13,3
Luhansk	19,9	31,5	33,9	11,9	19,6	21,1
Lviv	16,1	27,9	28,9	16,7	24,0	26,9
Mykolayiv	10,8	22,0	19,5	10,2	14,9	14,7
Odesa	28,0	44,1	44,4	28,7	35,8	36,8
Poltava	13,3	22,8	20,8	11,4	16,8	17,1
Rivne	8,9	12,0	13,4	7,7	12,7	13,0
Sumy	7,9	13,3	13,0	6,7	11,2	11,6
Ternopil	6,4	11,2	11,2	5,9	9,7	10,7
Kharkiv	22,4	37,8	34,4	18,8	25,1	25,4
Kherson	11,0	15,9	16,3	10,5	14,8	14,5
Khmelnyskiy	8,5	14,5	14,6	9,1	13,9	15,1
Cherkasy	13,6	20,4	24,8	12,9	16,8	18,1
Chernivtsi	6,1	11,1	10,1	6,1	9,3	10,1
Chernihiv	9,7	14,7	16,5	8,1	12,6	13,6

majority of which are marine fish species. The essence of this hypothesis is to change the structure of the consumer demand in favor of such types of fish as carp, grass carp, carp, bream, catfish, etc., the volume of cultivation and catching of which can be significantly increased in 3–4 years by fishing enterprises to provide the population with fish products and to ensure food security for this important food product.

The traditional formation of the domestic fish products market based on the imported raw materials is a reflection of the consumer habits of the Ukrainian buyers, which is negative for the economy of Ukraine only for this product group.

It is necessary to implement an active information policy aimed at changing the consumer preferences of the buyers in order to change the fish consumption structure in favor of freshwater species that are grown and caught by the domestic fishing enterprises. The increase in demand for such important

fish species as carp, crucian carp, white carp, etc., will contribute to the active development of fish farming in the inland water bodies and partially reduce the volume of imports [6–8].

Conclusions. The fishing industry of Ukraine is in a state of crisis. From 2011 to 2021, the volume of the fish catch decreased by 32% and gradually decreases every year. Domestic aquaculture provides only 20% of the domestic consumer needs for fish.

Ensuring an increase in the fish farming and fishing volume should be based on implementing a comprehensive state program for the development of aquaculture with the involvement of all available water, material and technical and raw resources.

The development of aquaculture in Ukraine requires an increasing consumer demand for freshwater fish species, and the cultivation of which is the main base for the untapped potential of fishing in the inland water bodies, and the implementation of a set of measures to restore the resource and production potential of the fishing industry. In particular, it should be noted the expediency of creating a favorable economic environment for attracting the investments into the implementation of the latest resource-saving technologies for the intensive pond, cage, river and basin fish farming. At the same time, it is necessary: to adopt a state target program to ensure preferential lending to fishing enterprises for the purpose of updating the material and technical base, to restore the water bodies and hydrotechnical structures; to develop the sales infrastructure aimed at selling the products through a direct channel from the producer to the consumer for a more significant influence of the enterprises on the sale price, which as a result will contribute to reducing the fish consumer prices for the population.

Another important problem in the fishing industry of Ukraine is the fight against illegal fishing, illegal sales of fish products with the tax evasion by the unscrupulous entrepreneurs who often hide the real scale of their economic activities.

Reducing the level of illegal extraction of the aquatic bioresources is not carried out effectively. The low level of the responsibility for violating the fishing rules does not contribute to their cessation, but on the contrary, contributes to the spread of poaching. The low level of compensation for damages, imposed fines and the possibility of avoiding responsibility does not ensure the sufficient influence on the violators of the environmental legislation.

Thus, the regulation of the fishing industry of Ukraine is insufficiently effective and creates the additional regulatory barriers for the business entities, leads to the unequal access to the common limited resource and to irrational using the water bodies and the aquatic biological resources.

In order to promote the development of intensive fish farming in Ukraine, it is necessary to implement a set of measures, in particular: to restore the

resource and production potential of the fishing industry, by creating a favorable economic environment for attracting investments into the implementation of the innovative technologies for intensive aquaculture of pond, garden, river and basin types; to develop the sales infrastructure; to provide the preferential targeted lending to fisheries enterprises for the renewing the basic production facilities and restoring the water bodies suitable for the cultivation of hydrobionts; to establish the integration processes between the fisheries farms and the economic subjects in the fields of plant breeding, livestock breeding and food industry enterprises, which contribute to developing the aquaculture in Ukraine.

СУЧАСНИЙ СТАН ДОБУВАННЯ ТА СПОЖИВАННЯ ВОДНИХ БІОРЕСУРСІВ В УКРАЇНІ

Бургаз М. І. – к.б.н., доцент,

Матвієнко Т. І. – старший викладач,

*Одеський державний екологічний університет, м. Одеса, Україна,
marinaburgaz14@gmail.com, tatyana.matvienko@gmail.com*

Основу сталого розвитку рибництва й аквакультури кожної країни формують водні біоресурси та їх ефективне використання. Це важливий ресурс продовольчої безпеки, що визначатиме її стан у найближчому майбутньому з урахуванням останніх глобальних трендів.

Протягом останніх років в Україні відслідковується тенденція до зниження вилову водних біоресурсів, зменшення виробництва власної рибної продукції, зменшення рівня споживання рибної продукції на душу населення з одночасним збільшенням імпортозалежності ринку, що свідчить про відсутність системи сталого розвитку та недостатнього фінансового забезпечення галузі рибного господарства, а саме рибне господарство, як цілісний комплекс, відіграє дуже важливу роль в економіці України.

Мета роботи полягала у з'ясуванні сучасного стану вилову риби та добування водних біоресурсів та аналізу споживання риби та рибних продуктів українцями.

На основі спеціалізованої літератури, нормативно-правових документів, що пов'язані з аквакультурою та зокрема рибним господарством, статистичних даних та наукових праць вчених, присвяченими розвитку рибної галузі України проаналізовано динаміку добування водних біоресурсів загалом та у внутрішніх водних об'єктах, вартісні показники розвитку аквакультури, проаналізовані фонди споживання продуктів харчування українцями за 2021 р.

Досліджені структури обсягів вилову морської та прісноводної риби за основними видами за 2021 р. проаналізовані зміни, що відбулися у структурі вартості виловленої морської та прісноводної риби.

Згідно з даними фонду споживання основних продуктів харчування населенням України за 2021 р. встановлено, що споживання риби і рибних продуктів знаходиться на останньому місці. Це пов'язано низькою купівельною спроможністю населення через зростання цін на рибу та падіння доходів більшості українців.

В результаті проведеного дослідження встановлено, що регулювання рибної галузі України є недостатньо ефективним, створює додаткові регуляторні бар'єри для суб'єктів господарювання, призводить до нерівного доступу до спільного обмеженого ресурсу та нераціонального використання водних об'єктів і водних біоресурсів.

Ключові слова: водні біоресурси, вилов, добування, аквакультура, споживання риби, морська риба, прісноводна риба.

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ВОДНІ БІОРЕСУРСИ ТА АКВАКУЛЬТУРА

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Видавництво і друкарня – Видавничий дім «Гельветика»
65101, м. Одеса, вул. Інглєзі, 6/1
Телефон +38 (095) 934 48 28, +38 (097) 723 06 08
E-mail: mailbox@helvetica.ua
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