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Fishery complex in the system of Russia's food security

Theoretical aspects of food safety and role of fish industry in food safety security are considered. Causes of small fish products sales domestically produced on Russian market are examined. Factors which keep back the fish products consumption are estimated.

Fish industry, food safety, fish products consumption, fish products landings on Russian coast.

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In the national security strategy economic and food security are essential ingredients.

The term "food security" was introduced in the international practice in the 70th after the grain crisis of 1972 – 1973. In order to monitor these issues the UN Food and Agriculture Organization (FAO) has established a permanent committee of food security under FAO and the criteria to ensure a stable situation was entered in a number of days of grain stocks carry-over, where the threshold value is equal to 60 days (17% of its annual global consumption).

At the World Forum on Food which took place in November 1996 in Rome the "Rome Declaration on World Food Security" was adopted which dealt with the duty of any nation-state to ensure "the right of access to safe and nutritional products in accordance with right to adequate food and fundamental right to life"[1].

The draft "Doctrine of the Food Security Russia" says that "the goal of food security is to ensure the needs of the population in food mainly due to domestic food supply at a level sufficient for its normal life" [2]. A similar formulation is in the draft Federal Law "On food security of the Russian Federation". There are currently more than 10 definitions of national food security. In general, they can all be reduced to ensure that food security is considered as the state's ability to provide sufficient and stable nutrition for the population. Agricultural scientists associate it primarily with the development of agriculture, assuming that countries' agro-industrial complex must provide at least 80 – 85% of products for the nutrition of the population [3, 4]. Liberal economists, while not denying the role of Russia's agro-industrial complex, largely attribute the food security of the country with the ability to import food, if comparative advantages are not conducive to its own production [5]. The position of food self-sufficiency took the EU and Japan. At the same time, the U.S. believe that their potential, as well as Canada's and Australia's is sufficient to guarantee food security around the world.

Interparliamentary Assembly of CIS countries in 1999 adopted the model law "On food security", in which, inter alia, states: "Food independence is not secured, if the annual production of essential foods in the country is less than 80% of the annual need of the population in such kinds of food in accordance with the physiological nutritional standards" (Decree № 14-10 on Oct. 16, 1992).

In addition to the availability of food it is necessary to consider aspects of its physical and economic access to the public, as well as a criterion for food safety.

Daily protein requirement for the normal life of the human body is 87 g. From 20 essential amino acids within the protein molecules, only 12 can be synthesized by the body itself and the rest must come from food. Because only animal proteins contain essential amino acids in large quantities and in optimal proportions, science has determined that the proportion of animal protein in the total daily demand for the body should be 56.3%, or 49 g [6].

The required daily calorie intake depends on the climate and on the profession. Optimum energy value of food consumed, according to FAO estimates approximately 2,700 kcal per day, and the level of malnutrition is defined in 1,750 kilocalories or less. In 1990, the nutritive value of selected foods in Russia was more than 3,000 kcal and was in line with economically developed countries. The present level of consumption shown in *table 1.*

The presented data does not need any special comment in our opinion. Let's pay attention only to the consumption of products that meet the needs in animal protein – meat, meat products and fish products. The fact is that the consumption of meat products at 70% of normal large number of them – the national average is 40%, in Moscow, St. Petersburg and other big cities up to 70 – 80% – is met through supplies from abroad, which means crossing the line of national security [7].

The level of per capita food consumption depends on the ratio of the population incomes growth rate, their differentiation and food prices. At present, the gap in consumption of grain products is by 2.4 times, meat – 9 times, and dairy products – 4.5 times, sugar and confectionery products – 10 times.

In connection with the country's transition to market economy the problem of quality and food safety has become particularly acute, it is associated with a massive inflow of poor quality, adulterated and hazardous products on food market. According to the National Consumer Protection Fund up to 85% of food products and forged in small wholesale food markets. About 80% of food commodities and food industry products are manufactured by industry standards and specifications, which originally assume simplified technology and the resulting products differs with low consumer qualities [8].

Fisheries make an important contribution to national food security. Despite a significant decrease in average per capita consumption of fish products – from 20.3 kg in 1990 to 13.9 kg at present (in the Murmansk region – 19 kg), their role in the nutrition of the population remains large: in the overall protein balance – about 16%, and meat and fish – up to 40% [9]. In 2006, Agriculture in Russia made 5.2 million tons of meat and fish industry extracted 3.3 million

Table 1. Consumption of basic food commodities by Russian population, kg per year/per capita

Product group	Recommended norm	Actual consumption		2007 in percentage	
		1990	2007	to the recommended rate	to the level of 1990
Bakery products	110	119	121	109	102
Potatoes	118	106	132	112	125
Vegetables and cucurbitaceous	139	89	110	79	124
Fruits and berries	113	35	54	48	154
Meat and meat products	84	69	56	67	81
Milk and milk products	392	386	242	62	63
Eggs, pcs.	292	297	254	102	86
Fish and fish products	23.7	20.,3	13,9	59	68
Sugar and confectionery products	40.7	44.5	39	96	88
Vegetable oil	13.0	11.0	12.8	98	116

tons of fish, which makes 38.8% of total raw material for protein products of animal origin production [10]. Actual production levels, according to the head of the Federal Agency for Fisheries A. Krainy, make up not less than 4.5 million tons per year. These are renewable resources [11]. Protein and energy value of fish products in comparison with others is shown in *table 2*.

Yielding to the caloric content, protein content of fish products is approximately the same as of meat. In developed countries it is their advantage.

The social importance of fish products to the population, in addition to their nutritional properties, is largely determined by the presence in hydrobionts of biologically active substances (BAS). Many countries (including Russia) began to receive new treatments and preventive medications, "border" between the product and medicine based on them in recent years in.

Inclusion hydrobionts containing many useful substances (along with the traditional fish oil for children) in the ration contributes to improving the health and human efficiency. This is evidenced by the development of scientists from many countries. The United States, Japan, Denmark, England and other countries focus their attention to this issue for a long time. Fish and seafood are actively promoted, they are called "health food". Foreign marketing studies show that modern buyers (not without the help of advertising!), form a new approach to food, which is required to have preventive and therapeutic effect on the human body. (Unfortunately, Russia can not boast of informing the public about nutrition and the results of scientific research in this area.)

Table 2. Protein and energy value of fish products

Product	Composition (edible part), grams per 100 g			Energy, kcal
	Water	Protein	Fat	
1. Lancet mottled (spotted)	79.0	14.7	5.3	107
2. Flounder	79.3	16.4	2.3	86
3. Salmon	62.9	20.8	15.1	219
4. Capelin (spring)	79.6	13.1	5.4	101
5. Grouper	75.4	17.6	5.2	117
6. Halibut (black)	70.2	12.8	16.1	196
(white)	76.9	18.9	3.0	103
7. Haddock	81.3	17.2	0.2	71
8. Atlantic herring bold	62.7	17.7	19.5	242
Atlantic lean	73.0	19.1	6.5	135
9. Atlantic mackerel	71.8	18.0	9.0	153
10. Cod	80.7	17.5	0.6	75
11. Kamchatka crab (meat)	81.5	16.0	0.5	69
12. Shrimp (meat)	77.5	18.9	0.8	83
13. Jack Mackerel	74.9	18.5	5.0	119
14. Hake	79.9	16.6	2.2	86
15. Mutton 1 cat.	67.6	16.3	15.3	203
16. Beef 1 cat.	67.7	18.9	12.4	187
17. Pork bacon	54.8	16.4	27.8	316
18. Pork fat	38.7	11.4	49.3	489
19. Pork meat	51.6	14.6	33.0	355
20. Venison 1 cat.	71.0	19.5	8.5	155
21. Chicken 1 cat.	61.9	18.2	18.4	241
22. Broilers (chicken) 1 cat.	69.0	17.6	12.3	183
23. Chicken Eggs	74.0	12.7	11.5	157
24. Beans	14.0	22.3	1.7	309

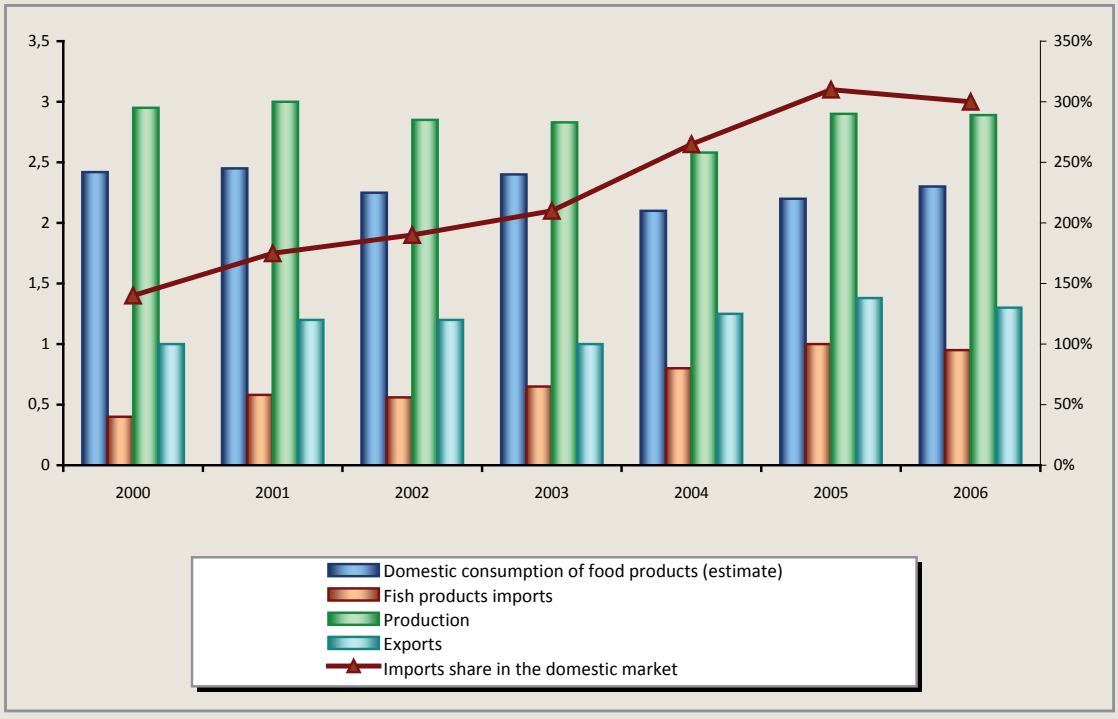
It is noticed that the indigenous inhabitants of some coastal regions of different countries, eating mainly hydrobionts, are less amenable to atherosclerosis. Myocardial infarction for them is a rarity. Scientists explain that by the presence in marine fish of significant concentrations of polyunsaturated fatty acids that reduce cholesterol and triglycerides in the blood. Therefore, evaluating the hydrobionts products quality it is necessary supplement the traditional formula of *protein* + *fat* + *carbohydrate* with: + *BAS* + *trace elements* + *vitamins*.

To emphasize the importance of the fish products use better it should also be noted that the protein of fish is better digested than meat: human organism assimilates 40 g of fish protein out of 100 g, pork – 20 g, beef – 15 g.

Fish consumption in Russia, calculated by the method of FAO now stands at about 17 kg per capita per year, while in France it is 25 kg, in Norway – 55 kg, in Japan – 75 kg, in Iceland – 100 kg, in Europe at the average it is approximately 20 kg [12], and in the world – 16.3 kg [13]. To ensure the consumption of fish by Russians at the recommended level (20 – 23 kg per capita by Russia's method and 27 – 31 kg by the FAO method), it is necessary to produce about 4 million tons per year. This volume of TACs is set for "home waters" at present, and with the resumption of fishing for capelin in the Barents Sea and the improvement of Pollock resources in the Pacific could increase significantly. In addition, it is necessary to balance exports and imports of fishery products. At present, at the annual food production of about 2.7 million tons about 1.3 million tons (almost 48%) of valuable hydrobionts are exported, and about 900 tons of low-value fish species are imported, many of which are used to production of non-food products in developed countries [14]. As a result, the total consumption of fishery products imports is about 41% *(figure)*.

The main reason for lack of sales on domestic markets of fish products produced in Russia, according to most scientists and experts is the low paying capacity of the population and high transport costs for the transportation of fish from the outlying fishing regions [15]. Fishing

Dynamics of production and consumption of fish products in Russia



industry is one of those in which production prices equaled the world under the influence of globalization, and the income of Russia's population is several times lower than in European countries, the United States and Canada. It is considered that about 90% of Russia's population is not able to buy most fish products (white fish, halibut, grouper, crab) at world prices (there are 38 million retirees, 55 million people with low-income and 36 million people who are "not very poor") [12]. Even Russia's fishermen working in the same sea with fishermen from other countries, have actual revenues in 2 – 3 times lower (the official average wage of the fishermen of the Northern Basin is less than that of Norway in 4 – 6 times).

The need to increase the supply of fish to the domestic market, based on the data above, will appear only in the third decade, when, according to the Government of Russia, Russians' incomes will increase substantially. However, it should be emphasized that judgments about the capacity of Russia's market and the Russians' preferences are currently based mainly on statements by fishermen defending their corporate interests. Nobody in Russia has not conducted specific marketing research, and is not going to, as estimated by the Norwegian, investment Analytical Group "Norge-Fish", modern fish market capacity in Russia amounts to 4.5 million tons of fish that with the current structure of the fish industry is equal to catch of 5 million tons. It is projected to increase by the year 2010 market capacity is approximately two times. There are expert estimates that the demand for fish fillets, steaks, smoked and salted products, despite fish industrialists' statements, is met only 50 – 70% [13].

Delivery of fish in the central regions of Russia of course leads to its rise in cost, and in the current situation, the Government could solve this problem without any loss to the railways. But at the same time one should not expect that it will fundamentally solve the problem of turning the flow of fish from export to the domestic market. In many cases, the increase in transport costs, in our opinion, more is not the cause but the reason for the reduction of supply in the domestic market. Otherwise, how should one consider the facts of favorable supply, e.g., pollack from the Far East to Germany, and then – to Russia, cod exports to the most remote countries in Europe, Canada and the United States. For example, according to vice president of the company "Poseidon" Galina Bondarenko, the Moscow market in is filled with German fish products of Russia (Far East) catches of triple thawing [16].

Researchers and shipowners consider that the main "medicine" to improve the competitiveness of the domestic fishing fleet and increase the supply of fish for the domestic market is state subsidies, the allocation of which, we believe, should be approached systematically, considering all the factors and expected results [17, 18, 19]. System analysis shows that this can be done both by internal and by external factors and without subsidies. Subsidizing the cost of fuel, as required by the fishing industry, will increase their income, preservation of vessels inefficient in operation and unsustainable production organization, but it is unlikely to increase supply of fish products to Russia, and to lower prices. Catches of pelagic fish species is realized mainly in the domestic market, as in Europe and America they are not in demand. For example, Norway in 2002 (there is no more recent data) used for fish meal, fat and animal feed 1 189 thousand tons of pelagic fish (43.4% of the total catch), including capelin catch – 75.5% , blue whiting – 99.6%, herring – 6.1%, launce – 100%, Norway paut – 100%. As for turning to the domestic market of cod, haddock and other demersal fish species supply, it is to some extent can be achieved at the expense of both economic and policy measures. Science-based methods developed in this regard, in particular, in the Institute of economic problems KSC RAS. The most effective of them, in our opinion, are:

– introduction of methods of empowering businesses trading subjects with bio resources quotas, enabling landings in Russia's ports;

– creation of fishing vessels service conditions in domestic ports adequate foreign;

– changes in taxation of fishing organizations, enabling delivery of catches in the ports of Russia;

– consolidation of fishing organizations and their integrating with fish processing;

– regulation of trade and marketing activities;

– expansion of product range, lifting the ban on chilled fish trade, promoting increased consumption of aquatic biological objects as part of good health and prolonging life;

– regulation of foreign economic activity.

System implementation of these measures in practice is constrained by inadequate legislation, poor management of fish industry, the multiplicity of supervisory organizations operating on a fee basis.

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