COVID-19 as a factor in the global food crisis

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Abstract. The article discusses the dynamics of the main food crises in the history of mankind. The factors that caused food threats are analyzed. The state of the modern world food market and its trends are assessed in the light of ongoing changes in the structure of production in the context of the COVID-19 pandemic. The main global threats that entail violated world economic relations between countries in the process of a complete ban and quarantine measures have been identified. The main measures to reduce the predicted negative product effects are proposed.

1. Introduction. The problem of global hunger

World hunger statistics show disappointing data on the food supply situation of the world's poorest countries. So, according to UN studies, in the world in 2018, there were 852 million starving people, in fact, this is every ninth inhabitant of the planet. The number of starving people in the zones of military conflict in the Middle East and Central Asia is constantly growing. We give general statistics on world hunger according to the Food and Agriculture Organization of the United Nations (FAO) (figure 1) [1].

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{fig1.png}
\caption{World hunger statistics for 2018.}
\end{figure}

The actual figures presented prove that the world is on the verge of a global catastrophe. The negative dynamics of the number of hungry people demonstrates the inefficiency of existing measures to
eliminate hunger. An acute food shortage is experienced by countries in Africa and Asia, that is, regions with extremely low living standards and access to food markets. The recurring world crises and military conflicts in the history of mankind during the XIII-XXI centuries do not make it possible to form an effective food supply system and social security for the entire earthly population.

Implemented by international humanitarian organizations under the auspices of the UN, the Program “Transformation of our world: the 2030 agenda for sustainable development”, provides for achieving zero world hunger by 2030 and reducing mortality due to hunger. [2, 3] Nevertheless, the dynamics of the global economy, constant crises and disruptions in the production of food raw materials do not make it possible to build favorable forecasts for improving food security. World food markets are already experiencing disruptions in the supply of certain categories of food products, as countries begin to impose restrictive quotas on the export of key products (wheat, rice, corn). Logistic supplies between states are violated due to complete quarantine and border closures for all freight transit transport. Extension of quarantine measures will lead to global irreversible product consequences for export-dependent countries of the world.

2. The main part. Food security of countries and measures in the context of the global crisis and the COVID-19 pandemic

The British research company The Economist Intelligence Unit since 2012 calculates the indicator of food security of the world - the Global Food Security Index. This indicator is today considered the most comprehensive indicator of the level of food security in the countries of the world. Based on the calculations, a rating of countries according to food independence is formed. In the ranking of 2018, 113 countries of the world took part. The leaders in this ranking are Singapore, Ireland and the United Kingdom. Russia is in 42nd place. The top 10 countries in terms of food security are presented in the figure (figure 2) [4].

![Figure 2](image)

**Figure 2.** TOP 10 countries by the Global Food Security Index of food safety in 2018.

The Global Food Security Index is based on three main criteria of food safety: the affordability of food for the population of the country, the adequacy of food supplies and the quality of food. The presented digital indicators of the index show that the poorest countries lack a 100% supply of food resources. Russia's position with an index level of 67% is not stable, since during periods of sharp decline in food production only 67% of the population will be provided with food products in the absence of food imports. Therefore, this indicator in the context of the global pan-democracy and the global crisis of agricultural production needs to be increased. Countries in this period can only rely on their resources, since strict quarantine measures, bans on the movement of any kind of transport, a ban
on the entry of migrants for work in agriculture, and a drop in production in the agricultural sector will inevitably lead to a reduction in the 2020 crop years and rising prices for all categories of production raw materials.

On April 10, 2020, despite all the measures taken by the states, the statistics of COVID-19 continues to grow. Growth leaders are countries with developed economies and a high proportion of the elderly population. Russia entered the TOP-20 countries by the number of patients with this disease (table 1) [5].

World statistics indicate a fairly high percentage of incidence of COVID-19 and a high mortality rate. So, according to the TOP-20, the highest mortality rate is observed in Italy - 12.73% and in the UK - 12.26%; the largest number of infected people in the USA is 457101 people, in Spain - 152446 people. In this rating, Russia occupies the 17th position with the number of infected 10131 people, and a mortality percentage of 0.75%. These are quite serious figures, which testify to the absolute unpreparedness of the world developed countries for this pandemic. The rapid increase in the number of infected and the wide geographical coverage are forcing states to tighten quarantine measures to absolute isolation, stop many industries and disrupt the start of the growing season. All this will result in severe economic imbalance in national economies, mass layoffs, rising prices, and customs and trade wars in such exporting countries as China, Russia, and the Persian Gulf countries. In fact, the world today received a new "black swan", which acts as a powerful provocateur of the development of the scenario of economic development.

Table 1. TOP-20 countries by the number of patients with COVID-19 on April 10, 2020.

| State                | Infected for the entire period | Total died | Recovered | Mortality rate |
|----------------------|-------------------------------|------------|-----------|----------------|
| USA                  | 457.101                       | 16.246     | 24.91     | 3.55           |
| Spain                | 152.446                       | 15.238     | 52.165    | 10             |
| Italy                | 143.626                       | 18.279     | 28.47     | 12.73          |
| France               | 117.749                       | 12.21      | 23.206    | 10.37          |
| Germany              | 115.523                       | 2.451      | 46.3      | 2.14           |
| China                | 81.865                        | 3.335      | 77.37     | 4.1            |
| Iran                 | 66.22                         | 4.11       | 32.309    | 6.21           |
| United Kingdom       | 65.077                        | 7.978      | 135       | 12.26          |
| Turkey               | 42.282                        | 908        | 2.142     | 2.15           |
| Belgium              | 24.983                        | 2.523      | 5.164     | 10.1           |
| Switzerland          | 24.046                        | 948        | 10.6      | 4              |
| Netherlands          | 21.762                        | 2.396      | 250       | 11.01          |
| Canada               | 20.69                         | 503        | 5.196     | 2.43           |
| Brazil               | 16.474                        | 839        | 173       | 5.1            |
| Portugal             | 13.956                        | 409        | 205       | 2.93           |
| Austria              | 13.244                        | 295        | 5.24      | 2.23           |
| South Korea          | 10.423                        | 204        | 6.973     | 1.96           |
| Russia               | 10.131                        | 76         | 698       | 0.75           |
| Israel               | 9.968                         | 86         | 1.011     | 0.86           |
| Sweden               | 9.141                         | 793        | 205       | 8.68           |

By the Decree of the President of the Russian Federation of April 2, 2020 No. 239 «On measures to ensure the sanitary and epidemiological well-being of the population in the Russian Federation in connection with the spread of a new coronavirus infection (COVID-19)», the work of all enterprises
producing essential goods was legalized. This category includes all enterprises and organizations that ensure the food security of the country and maintain the continuity of production of agricultural products, raw materials and food. This permission was obtained at the state level, but the relevant mechanisms for the operational launch of the sowing campaign were not promptly created in the regions. So, many farmers can’t get permission to work in the fields, can’t get passes for agricultural machinery, the form of passes is constantly changing, credit institutions refuse to farmers in obtaining short-term loans due to high risks, which introduces additional problems with work and directly threatens the country's food security.

For 2020, it is planned to increase sown areas from 79.5 million hectares in 2019 up to 80.3 million ha; crop growth of crops such as soybean, corn, grain, rice, buckwheat, potatoes, vegetables, oilseeds. With a favorable outcome, Russia will be fully provided with food supplies for 2020-2021. But if the situation with the pandemic becomes more complicated and quarantine measures are not lifted, then the crop will be harvested in a much smaller amount than planned [6].

In order to protect the domestic food market, on April 3, 2020, Russia introduced temporary restrictive quotas for grain exports to countries outside the Eurasian Economic Union [7]. This decision was made under the influence of the following global threats, according to analysts at the HSE's Center for Market Studies: forecasts of a new global crisis in 2021, a trade war between the USA and China, new US trade claims to EU countries, a slowdown in China’s economy, the worsening situation in the EU countries, the stagnation of the Japanese economy, the decline in growth rates of the Indian economy. The totality of these facts determines the future pessimistic forecasts of the development of world GDP, and against its background, the recession of the entire economic system of the world [8].

We will compile a comprehensive assessment of the opportunities and threats that can affect the growth of the domestic economy using the SWOT analysis tool, first proposed at Harvard by Professor Kenneth Andrews in 1963. Today, a SWOT analysis of strengths and weaknesses is today one of the effective tools for marketing analysis of the business environment of a company or other economic unit. We compose the SWOT matrix of food security in Russia on the basis of existing evidence and expert methods will assess the level of security. To this end, we will select 5 strengths and 5 weaknesses of the Russian agro-industrial complex, as well as opportunities and threats in the current situation. (table 2) [9].

The SWOP matrix of the strengths and weaknesses of the domestic agro-industrial complex makes it possible, on the basis of 5 main factors, to comprehensively assess the level of food security in the country under COVID-19 conditions, as well as determine priority measures to increase and stabilize the situation in agriculture. An assessment of the situation in the Russian agro-industrial complex conducted in table 2 showed that the weight of the weaknesses of the domestic agro-industrial complex is greater than the strengths (19 > 17). Nevertheless, the importance of opportunities in the agribusiness sectors is greater than threats (17 > 13). In this regard, it is necessary to pay attention to such weaknesses as: the unfavorable financial situation and the banking crisis, the disruption of economic relations due to the restriction of export of agricultural products. Among the strengths, in the future it is necessary to strengthen the position of the Russian agro-industrial complex in the formation of the Russian seed fund, and in increasing the yield of sown areas. These measures will make it possible in the future to strengthen the country's food security and avoid a long-term food crisis [10, 11].

3. Summarizing the results of the study
At the end of our study, we note that the growing uncertainty in the context of the global pandemic COVID-19 forces states to take certain measures to protect their own population and ensure its future existence. Today, world producers of food raw materials are in a difficult situation and quarantine measures have been introduced, which will negatively affect the agricultural season of 2020. Forecasts for the 2020 harvest are the most unfavorable, which requires intensification and expansion of financial measures to support the sectors of the economy that have been most affected by the new virus infection.
Table 2. SWOT-weighted matrix for assessing the level of food security in Russia.

| Strengths                                                                 | Relevance (from 1 to 5) | Grade, pt. 1-5 | Specific gravity, share |
|---------------------------------------------------------------------------|-------------------------|----------------|------------------------|
| 1. The accumulated state food reserves in the storage of the Federal Reserve. | 4                       | 3              | 0.1                    |
| 2. The accumulated international reserves of Russia in the amount of $550 billion dollars, the National Welfare Fund. | 2                       | 4              | 0.2                    |
| 3. 100-% availability of seed material in the agricultural sector.        | 1                       | 5              | 0.4                    |
| 4. State support for agricultural sectors.                                | 3                       | 3              | 0.2                    |
| 5. A sufficient amount of agricultural land, high productivity in recent years 3 years. | 5                       | 2              | 0.1                    |
| **Weaknesses**                                                            |                         |                |                        |
| 1. Demographic "pit"                                                       | 5                       | 3              | 0.15                   |
| 2. A sharp stratification of the population by income. Decreased purchasing power in the food market. | 3                       | 4              | 0.5                    |
| 3. Adverse financial situation, banking crisis.                           | 2                       | 3              | 0.15                   |
| 4. Violation of economic ties due to restrictions on agricultural exports. | 1                       | 5              | 0.1                    |
| 5. Increased natural disasters due to climate change.                     | 4                       | 4              | 0.1                    |
| **Opportunities**                                                         |                         |                |                        |
| 1. Formation of the internal infrastructure for storage and processing of food raw materials. | 4                       | 3              | 0.15                   |
| 2. Attracting public investment in the agricultural sector.               | 2                       | 4              | 0.2                    |
| 3. The development of the Russian seed fund in the agricultural sector.   | 1                       | 5              | 0.35                   |
| 4. Expanding sown areas and increasing yields of agricultural crops.       | 4                       | 3              | 0.15                   |
| 5. The development of rural territories and the formation of a production base in the village through government support measures. | 5                       | 2              | 0.15                   |
| **Threats**                                                               |                         |                |                        |
| 1. High dependence on imports of seed material of the Russian agro-industrial complex. | 5                       | 1              | 0.1                    |
| 2. Adverse epidemiological situation.                                     | 1                       | 4              | 0.3                    |
| 3. Reducing the number of labor resources in the agricultural sector due to the demographic "pit". | 4                       | 2              | 0.2                    |
| 4. The lack of demand for food raw materials in the market, for food products in retail chains due to a decrease in purchasing power in the economy. | 2                       | 3              | 0.2                    |
| 5. Reduction of the external market due to the ban on exports and the introduction of export quotas. | 3                       | 3              | 0.2                    |

The threat of a food crisis that may occur on world food markets will primarily affect food importing countries. These are countries in Africa, Asia and territories affected by military conflicts. Other states are testing a sharp jump in prices for essential goods and a decrease in consumer demand in the markets due to a sharp stratification of the population and a drop in real incomes of the main part of the population.

Russia is sufficiently provided with food supplies, has vast areas of agricultural land, is expanding the capabilities of the domestic market and is developing new directions in the agricultural sectors. Strengthening government support for agriculture and the influx of investment resources into the...
industry from the private sector will help to avoid a drop in production and processing of agricultural products. The SWOP analysis of the strengths and weaknesses of the Russian agro-industrial complex in the context of a pandemic showed that the opportunities and strengths of the industry will help maintain a high level of food security in the country in the short term.

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