The state of food industry as a factor in food security of transboundary territories

V Pomozova¹, T Kiseleva¹ and N Stepakova*²

¹ Kemerovo State University, 6 Krasnaya str., Kemerovo 650000 Russia
² Far Eastern Higher Combined-Arms Command School, 158 Lenin str., Blagoveshchensk 675000 Russia

E-mail: kitex74@mail.ru

Abstract. The article presents an analysis of the current state in the food industry in the Far Eastern Federal District. Also, it analyzes its impact on ensuring food security in the region.

1. Introduction
One of the primary problems at the present stage of development of society is the provision of high-quality food to the population. The food industry is one of the most important strategic sectors of the economy, on the state and development of which food security of the state depends. The availability of high-quality and safe food for all groups of the country's population in the volumes and assortment necessary to maintain a full-fledged lifestyle and performance is a factor determining the quality of life of the population and directly affecting the change in demographic situation [7].

In the framework of the Food Security Doctrine of the Russian Federation (adopted in 2010), the main measures to ensure food security of the Russian Federation are the organization of continuous monitoring and control of internal and external threats to food security, ensuring food independence through the stable development of domestic industrial and agricultural production, the introduction of innovative technologies and high-tech equipment at the food industry enterprises, quality assurance and food safety [1].

The purpose of this article is to analyze the state of the food industry in the Far Eastern Federal District in the framework of food security.

2. Materials and Methods
The theoretical basis of the study is regulatory documents. The information base is the reporting data of the Federal State Statistics Service, the Federal Customs Service, the Unified Interdepartmental Information and Statistical Systems. Research methods: analytical and statistical.

3. Results
The food industry of Russia is part of the manufacturing industry, and it is one of its key industries. By the volume of shipped goods of own production, the food industry is in the top three among the manufacturing industries, competing with such industries as metallurgical production and the production of coke and petroleum products [2]. Analyzing the state of the food industry from 2009 to 2018, it should be noted that in the pre-crisis period (2009-2014), the growth rate of the food industry in terms of the volume of products shipped did not exceed the growth rate of manufacturing industries (Figure 1).
Urbanization of the population amounted to 75.43%. Low temperatures of the Far Eastern Federal District are due to a number of features:

- Food production of the Far Eastern District is of particular interest, which is due to a number of features:
  - Long distances between the main cities and the coast, which makes it difficult to keep perishable products fresh during transportation.
  - A significant percentage of the population lives in rural areas, which makes it necessary to develop food production in order to ensure food security.
  - Cold climate, which makes it challenging to grow certain types of crops.

The development of food production industries leads to a change in the volume of shipped products. The onset of the crisis and the subsequent imposition of sanctions on the export to Russia of various types of products, the growth rate of the food industry increases significantly: in 2014, the food industry shows an increase of 113.3%, which is 2.7% more than in the manufacturing industry; in 2016, growth rates have a value of 106.7%, this is 3.8% more than in the manufacturing sector in spite of a decline [2].

![Figure 1. Dynamics of the volume of shipped goods of own production by branches of manufacturing industries and food industry [2-4].](image)

The development of food production industries leads to a change in the volume of shipped products in the regions of Russia. In many regions, there is a tendency to maintain the share of food industry products shipped among the manufacturing industries (Table 1) [2-4].

**Table 1. Regional indicators of the shipment of food products in the total shipments of the manufacturing industry, in%.

| Federal District   | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|--------------------|------|------|------|------|------|------|------|------|------|------|
| Russian Federation | 19.8 | 17.2 | 15.2 | 15.6 | 15.5 | 15.9 | 17.3 | 17.7 | 15.6 | 16.4 |
| Central            | 26.5 | 23.8 | 20.9 | 21.6 | 20.7 | 20.2 | 22.9 | 22.2 | 20.4 | 21.8 |
| Northwestern       | 18.5 | 15.1 | 11.4 | 12.6 | 12.6 | 13.2 | 15.4 | 16.0 | 15.1 | 16.4 |
| Southern           | 30.8 | 26.8 | 24.2 | 23.6 | 23.3 | 23.9 | 25.3 | 26.0 | 25.8 | 27.8 |
| North Caucasus     | 32.4 | 36.8 | 43.1 | 39.6 | 36.1 | 39.6 | 38.7 | 38.9 | 36.8 | 39.2 |
| Volga              | 13.5 | 11.8 | 10.4 | 10.9 | 11.3 | 12.1 | 13.0 | 14.0 | 11.2 | 12.6 |
| Ural               | 8.6  | 6.8  | 6.6  | 6.3  | 6.5  | 7.7  | 6.8  | 7.2  | 6.4  | 7.5  |
| Siberian           | 17.8 | 15.1 | 14.2 | 14.5 | 14.8 | 14.3 | 14.2 | 14.7 | 14.3 | 16.1 |
| Far Eastern        | 38.5 | 37.2 | 27.1 | 34.2 | 32.5 | 31.1 | 37.5 | 41.5 | 36.8 | 37.7 |
| Crimean            | 53.1 | 45.5 | 44.7 | 45.3 |      |      |      |      |      |      |

In the Southern, North Caucasus, and Far Eastern Federal Districts, the percentage of food production shipments among the processors is at least 25%. From the perspectives of the state and development of food production, the Far Eastern District is of particular interest, which is due to a number of features: geographical location, climatic conditions, socio-economic development.

The Far Eastern Federal District is one of the largest districts of Russia. It occupies 40.6% of the country’s territory, where 5.6% of the population of Russia lives. It is the most remote from the developed regions of the country. The climatic conditions of the Far East Federal District are characterized by sudden temperature changes, high humidity in the warm season, long winter weather with low temperatures. This, in turn, negatively affects both the physical and mental state of people. Urbanization of the population amounted to 75.43% in 2017. Urbanization contributes to the increasing
concentration of anthropogenic stress, as a result of which the environment is polluted more intensively. The urban environment may not keep up with its rapid growth. For example, in many cities of the Far Eastern Federal District, the quality of water and air does not meet the necessary standards [5]. Such environmental conditions dictate increased requirements for providing the population of the region with healthy and safe food.

**Table 2.** The structure of the resource base for basic foodstuffs in the Far Eastern Federal District [2].

| Resource type | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---------------|------|------|------|------|------|------|------|------|------|
| Meat and meat products, thousand tons per capita, kg / year import share, including import, % | 13.26 | 12.99 | 13.44 | 13.10 | 12.98 | 13.96 | 12.65 | 12.54 | 12.91 |
| Milk and dairy products, thousand tons per capita, kg / year import share, including import, % | 41.7 | 42.30 | 43.05 | 51.44 | 53.19 | 46.02 | 52.63 | 54.48 | 53.29 |
| Potatoes, thousand tons per capita, kg / year import share, including import, % | 13114 | 12838 | 12884 | 13221 | 10377 | 13076 | 11925 | 11212 | 11973 |
| Vegetables and melons, thousand tons per capita, kg / year import share, including import, % | 203.0 | 204.0 | 205.0 | 211.0 | 166.0 | 210.0 | 192.0 | 181.0 | 193.7 |
| Eggs, mln. per capita, pieces import share, including import, % | 1127 | 1189 | 1167 | 1185 | 1149 | 1189 | 1149 | 1191 | 1173 |
| Milk and dairy products, thousand tons per capita, kg / year import share, including import, % | 7.22 | 7.07 | 9.02 | 9.09 | 12.18 | 11.45 | 10.51 | 16.13 | 14.16 |
| Meat and meat products, thousand tons per capita, kg / year import share, including import, % | 3889 | 4012 | 4300 | 4338 | 3913 | 4503 | 4012 | 4138 | 4136 |
| Milk and dairy products, thousand tons per capita, kg / year import share, including import, % | 60.2 | 65.8 | 70.6 | 71.8 | 64.6 | 74.6 | 66.7 | 66.8 | 66.9 |
| Eggs, mln. per capita, pieces import share, including import, % | 56.3 | 58.3 | 57.0 | 54.7 | 56.6 | 57.5 | 57.8 | 57.6 | 57.1 |
| Milk and dairy products, thousand tons per capita, kg / year import share, including import, % | 1127 | 1189 | 1167 | 1185 | 1149 | 1189 | 1149 | 1191 | 1173 |
| Meat and meat products, thousand tons per capita, kg / year import share, including import, % | 175 | 189 | 187 | 191 | 185 | 193 | 191 | 191 | 193 |
| Eggs, mln. per capita, pieces import share, including import, % | 39.6 | 38.1 | 40.2 | 34.9 | 40.3 | 34.4 | 38.7 | 39.5 | 48.5 |

One of the main factors of food safety is the degree of dependence on the importation and importation of food into the region. The data in table 2 indicate that only milk and dairy products show positive dynamics. In the period from 2012 to 2016, the imports of this type of products decreased by 2.4%, and over the past 9 years there was a steady increase in the production of milk and milk products per capita. Between 2012 and 2017, this indicator increased by 16.68 kg / year. The critical situation is in such types of products as meat and meat products and vegetables and melons and gourds. The volume of production of meat and meat products per capita is not able to satisfy the physiological norms of consumption of these products even by 20% [6]. From 2012 to 2017, the share of imported and imported meat products exceeds 50%. The volume of vegetables and gourds grown on the territory of the Far Eastern Federal District averages 50% of the recommended physiological norm of consumption, while the share of imported resources remains consistently high and amounts to 55-58% relative to its own production.

According to the state of the resource base of basic food products, not only food independence, but also physical accessibility of food products is determined. One of the criteria for assessing the physical availability of food is the actual energy value and composition of substances included in the daily diet of the population.
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Table 3. The actual nutritional and energy value of the daily diet of the inhabitants of the Far Eastern Federal District, per person per day.

| Indicator          | 2009  | 2010  | 2011  | 2012  | 2013  | 2014  | 2015  | 2016  | 2017  |
|--------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Squirrels, g       | 72.9  | 77.1  | 78.3  | 79.4  | 80.4  | 79.9  | 76.1  | 74.0  | 73.5  |
| Fat, g             | 98.5  | 105.8 | 107.0 | 108.0 | 109.0 | 108.4 | 103.4 | 101.6 | 102.0 |
| Carbohydrates, g   | 321.4 | 338.8 | 338.4 | 337.2 | 334.7 | 331.6 | 313   | 303.7 | 301.6 |
| Energy value, kcal | 2474.2| 2627.4| 2641.2| 2650.9| 2652.9| 2633.3| 2498.4| 2435.8| 2429.9|
| % to normal        | 82.5  | 87.6  | 88.0  | 88.3  | 88.4  | 87.7  | 83.3  | 81.2  | 80.9  |

Analyzing dynamics of the total energy value and the quantitative composition of substances in the consumed grocery set, which is presented in Table 3, it should be noted that there is a lack of nutritional balance. Inadequate carbohydrate intake is observed. The actual carbohydrate intake of DFO residents is no more than 75% of the recommended norm, while the fat intake exceeds the recommended rate by 10-15%. The most stable is the consumption of proteins, the dynamics of consumption is in the range of 90-100%. The total energy value of the food basket averages 85% of the recommended norm [7]. These indicators indicate that physical accessibility of food products is not fully implemented in the region.

4. Discussion

The analysis of quantitative indicators of food production in the Far Eastern Federal District allows us to draw the following conclusions:

- The volume of shipment of food products among the processing industries remains stable with minor fluctuations, which corresponds to the indicators for this criterion for Russia as a whole;
- From a consumer point of view, the DFO only partially fulfills its intended function of providing the population with high-quality food;
- Ensuring food security, as one of the functions of the food industry in the region, is not fully implemented, as evidenced by the volumes of imported and imported food products.

5. Conclusion

For successfully implementing objectives of the food industry in the Far East region and increasing the volume of its own food production, a complex system of measures is needed, consisting both in state support of the region, development of agricultural production as a raw material base of food production, and in the development of interregional ties in the food industry security.

References

[1] Presidential Executive Office 2010 Decree “On Approval of the Doctrine of Food Security of the Russian Federation” (January 30, 2010 No. 120) Available at: http://base.garant.ru/12172719/#ixzz5jTt7kAfa
[2] Federal State Statistics Service (2019) Statistical database Available at: http://www.gks.ru
[3] Rosstat 2016 Industrial production in Russia in 2016 (Moscow, Russia: Rosstat)
[4] Rosstat 2018 Russian statistical yearbook - 2018 Available at: http://www.gks.ru/free_doc/doc_2018/year/year18.pdf
[5] Shkrabtak N, Frolova N, Kiseleva T, Sergeeva I, and Pomozova V 2019 Impact of environmental conditions on the health of the Far Eastern region population. Appl. Sci. 9, p 1354 doi:10.3390/app9071354
[6] Ministry of Health of the Russian Federation 2016 Order “On approval of Recommendations on rational norms of food consumption that meet modern requirements for healthy nutrition” (August 19, 2016 No. 614) Available at: http://www.garant.ru/products/ipo/prime/doc/71385784/
[7] MR 2.3.1.2432-08 2008 Norms of physiological needs for energy and nutrients for various groups of the population of the Russian Federation (December 18, 2008) Available at: http://docs.cntd.ru/document/1200076084