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# Modern tendencies of the development of a food belt in Kazakhstan

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## Abstract

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The economic development in the medium-term period in the Republic of Kazakhstan will be balanced and is directed to domestic demand with the orientation to the increasing investments into industrial and infrastructural projects at the expense of private and public funds that is updated in the author's research. Taking into account the specialization of the regions defined in the Expected scheme of territorial and spatial development of the country till 2020, the development of agro-industrial complex with the increase of its efficiency and productivity, innovative modernization, deepening of the processing of agricultural products and creation of a highly productive "food belt" around the city of Astana is considered the perspective direction. As a result of the conducted researches practical aspects and importance of management of the region are determined, on the basis of which the corresponding conclusions are drawn.

*Keywords***:** national economy; agro-industrial complex; food; food belt; capital

## Introduction

Agro-industrial complex of Kazakhstan is becoming stronger and stronger with the state support. But the present stage of development puts in the agenda a number of new major tasks before the industry. The primary of them is ensuring food security of the country. One of priorities in this plan for the Akmola region is providing Astana with food in full and of corresponding quality The capital of the Republic of Kazakhstan violently grows, the number of its population increases also. Now about 700 thousand people live in the region, and in the nearest future the population will increase up to one million.

The question of creation of a food belt around Astana arose even during the transfer of the capital from Almaty. The districts of the region, the processing enterprises of Kokshetau next to the capital, were defined in recent years.

Districts and agricultural enterprises of the region entering a food belt already started development of a number of the projects aimed at food supply of the capital.

Great opportunities for establishing the production of food and delivery to the residents of the capital are given to the agricultural formations participating in the Program of a food belt around Astana.

The volume of food products delivered by the Akmola region to Astana is obviously insufficient. At the moment the deficiency of milk, even dry is felt in the capital, the sausage shops suffer a shortage of raw materials as the system of deliveries in this connection is not worked out. It is necessary to adjust a trnsport-logistics system in deliveries.

In modern scientific literature of foreign authors great attention is paid to the questions of regional government from various positions of social and economic development. For example:

Dzikowski (2015) studied the impact of communications between suppliers and consumers in a production and marketing chain on the innovative activity in the food industry on the example of the region – the western part of Poland. Cimpoies (2016) considered competitive advantages and shortcomings of international trade of agro-industrial products of Moldova in the context of the neighbourhood with EU countries. Kramarenko (2017) conducted researches on features of social and economic development of the region.

The contribution on carrying out research in the food industry was made by the Russian scientists (Komarov et al., 2003) considered the environmental problems in the food industry and ways of their solution in their researches. Gospodarchuk (2006) analyzed the features of functioning of regions as independent economic entities of corporate type.

Questions of territorial development were considered by economists; Stepanova (2002) studied methods of economic justification of the territorial organization of the establishment. Chapek (2011) examined the territorial aspects of formation and development of small business and the territorial and industrial specification.

Development of economy of Kazakhstan at the present stage is traced in the publications of the Kazakhstan economist-scientists, such as: Sagadiyev (2006) –investigated the strategy and tactics of transformation of economy of the Republic of Kazakhstan. Mustapayev (2007) focused his attention on studying the processes, mechanisms and directions of the formation of competitiveness of the regions of the Republic of Kazakhstan. Aubakirov (2009) showed the scientific approaches based on the achievement of a classical and modern economic thought, conducted researches on the problems of development of the Kazakhstan economy.

Sidorovich & Abisheva (2009) generalized features and trends of the formation of national economy of Kazakhstan. Kabdullina (2012) concretized the mechanisms of increase in efficiency of agricultural production of Northern Kazakhstan. Zhatkanbayev (2013) systematized the idea of regulating the role of authorities in modern Kazakhstan economy. Dzhakisheva & Skull (2017) designated the processes of transformation and updating of mechanisms of production process and distribution of national richness of the Republic of Kazakhstan. Kozhakhmetova et al. (2018) analysed the essence and criteria of food safety on self-reliance, physical and economic availability, stability of food supply, food consumption. Sayabayev et al. (2018) demonstrated the factors of development and strengthening of rural territories of Kazakhstan.

However, the analysis of publications shows that the given field of the scientific direction hasn't been studied enough. The authors` researches are being directed on the further studying of the features, peculiarities and modern tendencies of the economic development and regional politics of Kazakhstan.

## Methods

On investigated topic it is more efficient to use mathematical methods (2000) which will help to solve the problem of the organization of transportation of some product between points of its production which number is equal to m and n points of consumption. Each *i*-point of production ($i \in 1{:}m$) is characterized by a stock of the product $a \geq 0$ and each *j*-y point of consumption ($j \in 1{:}m$) – by the need for product $b \geq 0$. The network of roads connecting the system of the considered points is modelled by means of a matrix. From dimension of m on n which elements with $c_{1j}$ represent the norms of costs of transportation of unit of cargo from point of production *i* in point of consumption of *j*. The plan of transportation of freight in this transport network is presented in the form of the massif of elements of dimension of $m \times n$:

$$x = (x_{11} \ldots x_{1n} \ldots x_{21} \ldots x_{2n} \ldots x_{ij} \ldots x_{in} \ldots x_{mj}) \quad (1)$$

In the plan of transportations x could be considered as the vector which is breaking up into m groups with n elements in each, so as the whole group corresponds to the freight volumes which are taken out from *i*-point of production to all possible points of consumption. If real transportation between points *i* and *j* is absent, then it is considered = 0.

The organization of possible values **x** has the following form:

1. Restrictions for satisfaction of the needs in all points of consumption:

$$\sum_{i=1}^{m} x_{j1} \geq b_{1j}{:}j \in 1{:}n. \quad (2)$$

2. Restrictions for possibilities of export of stocks from all points of production:

$$\sum_{i=1}^{m} x_{j1} \geq b_{1j}{:}j \in 1{:}m. \quad (3)$$

3. Conditions of no negativities of components of a vector of the plan:

$$x,x^{j1} \geq 0.i1 : m.j1{:}n \quad (4)$$

Essential characteristics of the described model is the ratio of parameters a. If the total output is equal to the total volume of consumption, namely

$$\sum_{i=1}^{m} a_1 = \sum_{j=1}^{n} b_j. \quad (5)$$

Then the system is called balanced.

When performing the condition of a balance it is reasonable to impose such restrictions for total import and export of the freight at which all freight is completely taken out and there is no unsatisfied requirement left, i.e. above-mentioned conditions get a form of equalities.

By analogy with the problem of production planning we will offer that the costs of transportation are directly proportional to the quantity of the transported freight. Then the total costs of transportation in the system will take the form:

$$f(x) = \sum_{i=1}^{m} \sum_{j=1}^{n} c_{1j} x_{1j}. \quad (6)$$

The function and restrictions described above which are written down in the form

$$D = \{x \in R^{mn} | \sum_{j=1}^{n} x_{1j} = a, i \in 1{:}m;$$
$$\sum_{i=1}^{m} x_{1j} = b_1, j \in 1{:}n; x \geq 0\}, \quad (7)$$

set the transport model. On its basis the problem of minimization of total costs of transportations can be formulated:

$$f(x) = cx \rightarrow \min, x \in D. \quad (8)$$

In this connection, in references, it received the name of a transport task in the matrix statement.

## Results and Discussions

At the present stage of development of the public relations social and economic development of the national economy is more and more relevant. In this regard, economic problems are investigated multidimensionally, including those from the position of the regional government. The target method which is directed to increase the competitiveness of the region (Figure 1) has to be the basis of the mechanism of the regional policy.

According to the Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan from January 1, 2018 1,030,577 people are living on the territory of the city of Astana (Figure 2).

The need of the population of main types of food products by the minimum norms makes about 635 thousand tons.

At the moment a number of new major tasks before the food industry are put forward. The primary of them is ensuring food security of the country. One of priorities, in this occasion, for the Akmola region is providing Astana with food in full and of corresponding quality.

Recently the positive tendency in terms of the state support of agro-industrial complex of Kazakhstan is observed. In October, 2017 the Road map on the formation of a food belt of Astana for 2017−2018 was approved. The zone of a food belt includes 17 districts of the Akmola region and 4 regions of the Karaganda region.

The needs of the capital become covered due to production and deliveries from the zone of a food belt around Astana, other regions of the country and also abroad.

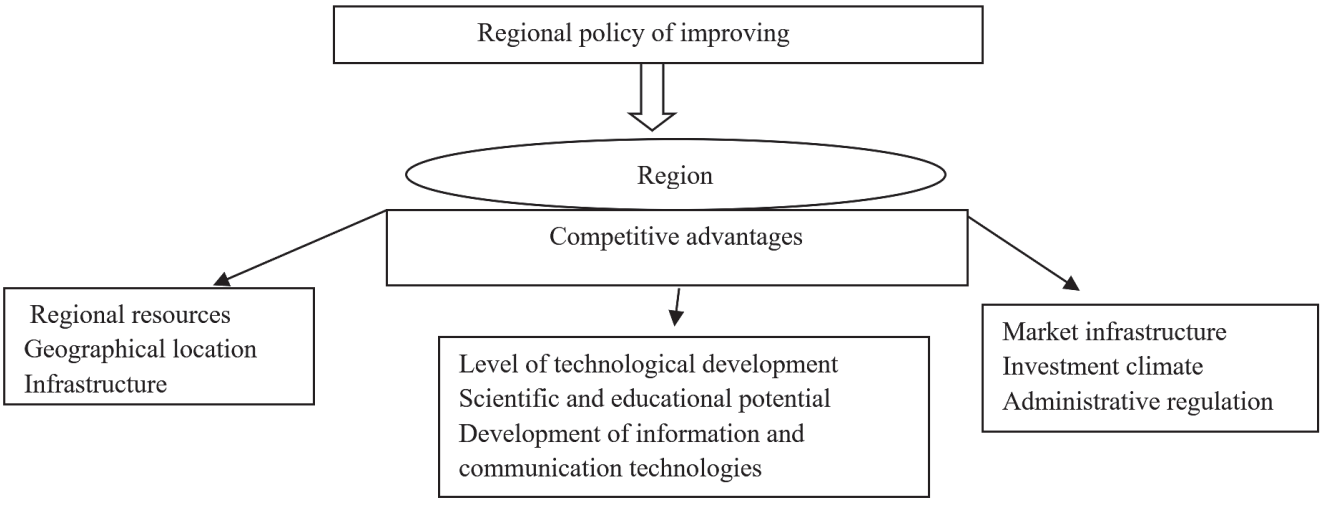


**Fig. 1. Main directions of the regional policy of improving competitiveness**

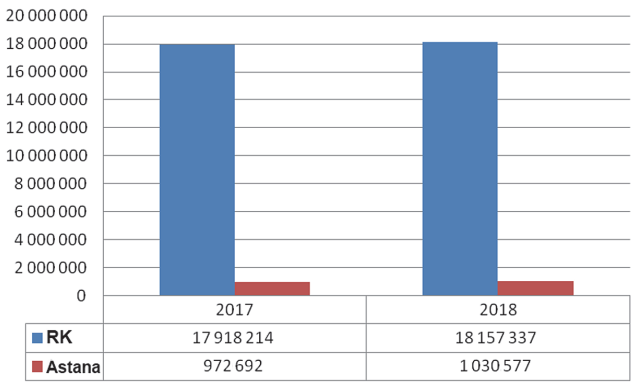


**Fig. 2. Population of the Republic of Kazakhstan and Astana during the period from 2017 – 2018**

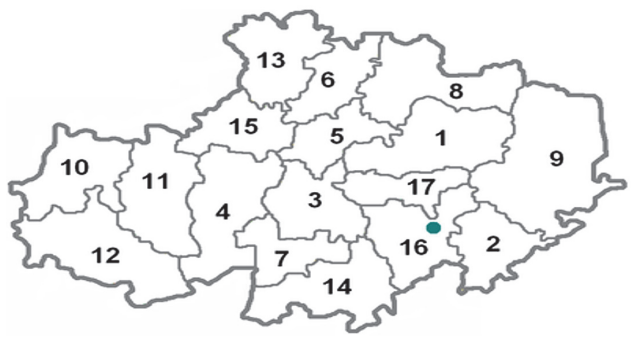


**Fig. 3. Map of the Akmola region**

The zone of a food belt includes 17 districts of the Akmola region (Figure 3) (Arshalynsky, Akkolsky, Atbasarsky, Astrakhan, Bulandinsky, Egindykolsky, Birjan Sal, Ereymentausky, Esilsky, Zhaksynsky, Zharkainsky, Zerendinsky, Korgalzhinsky, Tselinograd, Sandyktausky, Shortandynsky, Burabaysky) and 4 regions of the Karaganda region (Abaysky, Bukhar-Zhyrausky, Nurinsky, Osakarovsky).

There are 17 districts as a part of the Akmola region:

1. Akkolsky district; 2. Arshalynsky district; 3. Astrakhan district; 4. Atbasarsky district; 5. Bulandynsky district; 6. Burabaysky district; 7. Egindykolsky district; 8. Region of Birzhan-sal; 9. Ereymentausky district; 10. Esilsky district; 11. Zhaksynsky district; 12. Zharkainsky district; 13. Zerendinsky district; 14. Korgalzhynsky district; 15. Sandyktausky district; 16. Tselinograd district; 17. Shortandinsky district.

For the development of production of goods in the zone of a food belt, the use of the available potential of production of the city and nearby areas in a radius of 300 km from the city of Astana is planned. It will allow to load refinery capacities and to provide the population of the capital with products of domestic producers.

For increase in scope of the supply of agricultural products to the population of the city "The comprehensive program of the development of a food belt around Astana for 2015-2018" was approved (the decision of the Akmola regional administration from February 17, 2015 No. 5s-34-3).

The program will provide a package of measures for the achievement of the goal, tasks and increase in volumes of effective production of agricultural products and products of its processing in a food belt around Astana.

Nowadays 128 enterprises of our area deliver products, including 68 – on stock-rising products (meat and meat products, milk and dairy products), 6 – on poultry-farming products (fowl, food egg), 54 – on crop products (flour, potatoes, vegetables, vegetable oil).

At the same time, except the above-stated enterprises, the delivery of products to the capital is carried out also by private subsidiary farms in which there are about 70% of the cattle out of the general livestock of the area.

In four areas of the Karaganda region, entering a food belt of the capital of Kazakhstan, the creation of 16 objects is planned which will provide Astana with inexpensive and of good quality food. For these purposes the government of the republic allocated 4.9 billion tenges. 11 objects have already been brought into operation, 3 objects have to enter a system until the end of the current year.

It is planned to invest 27.3 billion tenges in 48 projects of the food belt.

The main types of food products at the expense of a zone of a food belt are: flour, pasta, meat, vegetables, dairy products, rice, sunflower oil, buckwheat, tea, sugar, eggs.

For the development of trade and logistic infrastructure the wholesale distribution center (further – WDC) in Astana will be created which will become the solution of problems of numerous intermediaries and their speculative pricing. The WDC`s main function will be the possibility of an entry for local producers of agricultural products into the direct market of wholesale buyers. It not only promotes the sale of goods at the market fair prices, but also reduces costs of storage of goods, increases commodity turnover of the producer. Besides, the functioning of such center will allow to increase the producers` knowledge of market condition and as the result can promote fast adaptation of production to the demand for goods.

In 2017 the Road Map of development of the food belt of Astana for 2018–2021 was approved in the government. The purposes of the Road map on the formation of a food belt of Astana for 2018

Development of production in the zone of a food belt:

• Construction of the 5 thousand tons power a year meat-processing complex for the production of missing volume of meat products in Astana is planned in 2018 – 2019 (in the Akmola region);

• In 2020 – 2021 16 dairy and commodity farms for loading of the milk-processing enterprises will be constructed (5 – in the Akmola region and 11 – in the Karaganda region);

• In 2019 – 2020 works on the restoration of the irrigated lands for cultivation of missing volumes of vegetables will be carried out.

Development of trade and logistic infrastructure:

• Creation of conditions for ensuring stable deliveries of food products from other regions of the republic which production is inexpedient in a zone of a food belt. For this purpose the mechanism of assignment of the status "The participant of a food belt of the capital" will be introduced. It will provide to subjects of agro-industrial complex a priority exit to sales markets in the city, including the municipal markets and so forth.

• Development of trade and logistic infrastructure. For this purpose the wholesale distribution center for granting an entry to an opportunity for domestic agricultural producers into the market of wholesale buyers will be created in Astana.

It is expected that the introduction of a new system of development of the regional centers will be able to provide the guaranteed realization of finished goods in the volumes and terms determined on a daily and monthly basis, to solve a problem of delivery of finished goods from producers to retail chain stores, to provide access for consumers to quality, natural, environmentally friendly products, decrease of added value of products to storage and logistics.

The relevance of questions affects the efficiency of the implemented projects within a food belt frame. These are, first of all, the questions of the supply of a source of raw materials, costs on infrastructure ensuring production, insufficient level of modern technology solutions. The second block is connected with the lack of planned character, rhythm of deliveries of products to retail chain stores, backwardness of transport-logistic services, the lack of legislative regulation of support of domestic manufacturers regarding the promotion of products.

The main directions of implementation of the Road map. of the Plan of measures on the formation of a food belt of Astana for 2018 – 2021 are shown in Figure 4.

Besides, for prevention of the seasonal fluctuation in prices of fruit and vegetable products the construction of the respective greenhouses with a total area of 7 hectares and storages with a single power of storages of 38 thousand tons is planned. These volumes will satisfy the general needs of the population of Astana for these products.

In general the carried-out work on the development of Agro-industrial complex (agrarian and industrial complex) and the implementation of this Program will allow:

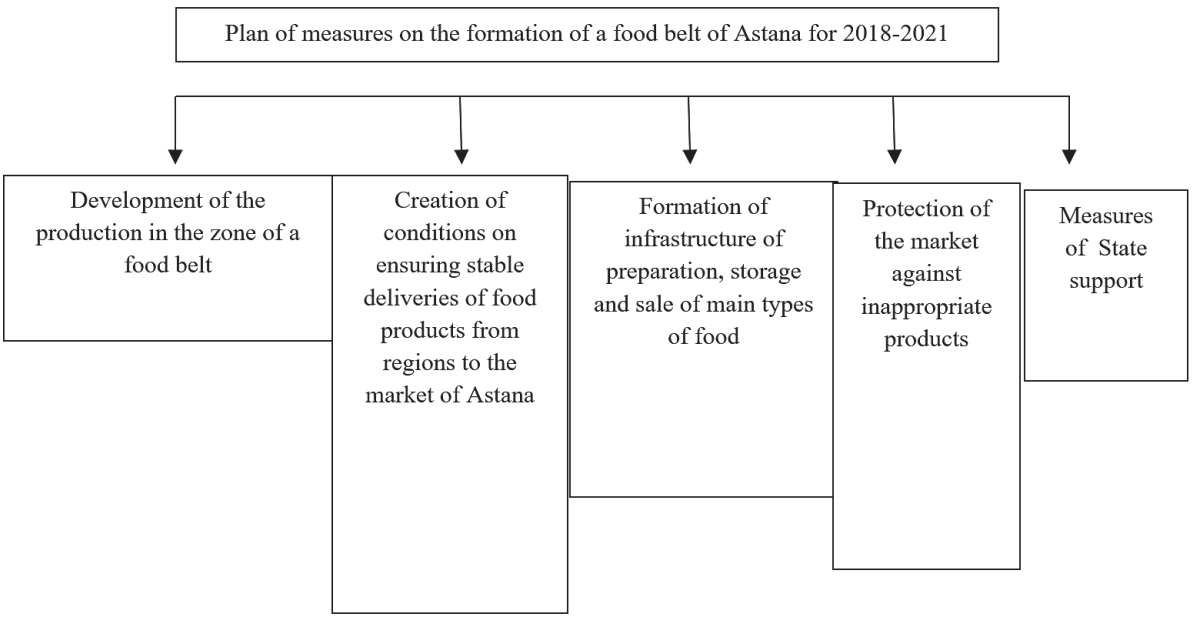


**Fig. 4. Measures for the formation of a food belt of Astana in the period of 2018-2021**

– to increase volumes of deliveries of the main types of food to the market of Astana from the Akmola region;

– to create a stable source of raw materials in the zone of a food belt;

– to provide the residents of the capital with main types of food at the affordable prices due to application by agro-formations of modern methods of production and minimum flows on transportation of products;

– in the solution of food security the introduction of innovative methods of managing, new technologies connected with the acquisition of the new modern equipment has to be a powerful incentive of development.

Within a food belt of Astana «Kazagro» carries out the monitoring of 38 borrowers implementing the projects with a total cost of 25.5 billion tenges, including the total amount of 18 billion tenges financed by Kazagro in the following directions:

– meat livestock production – 8 projects (5.2 billion tenges).

– dairy livestock production – 4 projects (2.3 billon tenges);

– production and storage of vegetables – 7 projects (3.2 billion tenges);

– poultry farming – 8 projects (6.1 billion tenges);

– processing of agricultural products, including grain – 10 projects (1.2 billion tenges);

– processing of the sunflower – 1 project (9 million tenges).

Out of the total number of projects 24 projects with the total amount of 13.1 billion tenges fall on the Akmola region and 14 projects with the sum of 4.9 billion tenges fall on the Karaganda region.

According to the data provided by Kazagro, due to the results of implementation of the food program the following volumes of products were supplied to the food markets of Astana at the expense of the projects financed by the holding (Table 1).

**Table 1. Food market of Astana**

| Type of products | Volume, tons | % of the available need of the city |
|---|---|---|
| Meat and meat products | 11877 | 26 |
| Milk and sour-milk products | 6219.2 | 2.7 |
| Fish, fish products | 17.9 | 0.4 |
| Eggs | 108.9 | 72.3 |
| Cabbage | 800 | 5.3 |
| Potatoes | 1300 | 1.3 |
| Fat-and-oil products | 31 841.3 | n/a |

After the introduction of three greenhouses at full capacity in Karaganda, Stepnogorsk and Astana more than 3500 tons of cucumbers and 1890 tons of tomatoes will be supplied to the market that will make, respectively 31% and 8% of the need of the city. The input of vegetable storehouses for 5580 tons will provide the growth of the storage power by 1.5 times. It is planned to remove for full capacity the work of the meat-processing plants and feedlots financed by Kazagro. Among them – AstanaAgroProduct, KAZBeefLTD,,LTD and APO «Jana Bas» in Enbekshildersky district of the Akmola region, Zdorovye produkty LTD and others. All this will allow increasing in addition the production of beef meat by 9967 tons, or by 22% out of requirement.

As a result only at the expense of the projects financed by Kazagro the need for meat will be solved by 77%. Supply with milk and dairy products at the expense of the projects of Kazagro achieved 10% in 2012; 17% are reached in 2011. In addition, the supply with meat and meat products by 12.2%, with vegetables – by 2.6% is expected at the expense of the projects financed by Kazagro in other regions which are planning deliveries to Astana.

## Conclusion

Astana is a good sales market of any products. Therefore the most profitable are the enterprises located near the capital. The three hundred-kilometer zone of a food belt is conventional. It is very difficult to provide stability of deliveries at such radius. These are considerable transportation costs, impossibility of delivery because of weather conditions, damage of products during the transit to long distances. Therefore we suggest to reduce a delivery shoulder due to the reduction of the zone of a food belt in the radius up to 60-100 km.

In 2007 the need of the population of the capital, according to the administration`s information of the Akmola region, included: in meat and meat products – 49 thousand tons, milk and dairy products – 308 thousand tons, eggs – 154 million pieces. During 2007 agricultural producers of the area delivered 12.5 thousand tons of meat and meat products, 46.3 thousand tons of milk and products of its processing, eggs – 62 million pieces to the markets of the city and specialized shops that constituted to the annual requirement, respectively 25.5,15 and 40.3%. It was necessary to change this situation cardinally not to deliver products from abroad. Large-scale projects which would allow to resolve an issue of supply of the capital with products in short terms were necessary. The examples of successful mutually beneficial cooperation between the capital and agricultural producers of the area in those years were such farms as Agricultural Firm “Rodina” LTD, the Izhevsk factory, Poisk LTD and others. Alongside it was necessary to resolve also an issue of construction of modern processing plants. Considerable means were neces-

sary for all these projects. And they were allocated. By 2009 the Institutes of Development of the Ministry of Agriculture considered 139 business projects presented by the subjects of agrarian and industrial complexes which enter the zone of a food belt of Astana. 47 projects from them were financed for the total amount of 2.7 billion tenges.

The market of the capital is dependent on the influence of seasonal, weather and other fluctuations. It is impossible to track the price balance. Today the volume of deliveries from the zone of a food belt covers the need of the city only by 35%. At the same time data of the regions show that by some positions the supply with bread and bakery products is nearly 200%, meat and meat products – 100%, milk and dairy products – 100%, eggs – 200%, potatoes – 106%. However these indicators do not influence the pricing counter against all economic and marketing laws. The prices steadily grow, the shelves of shops are filled up with products of other regions and from abroad. Now around Astana there are two big poultry farms under construction. In the market of Astana poultry is enough, but it is necessary to carry out the balance analysis of production and consumption. A number of projects were successfully implemented. Among them the construction of a dairy and commodity farm in Agricultural Firm "Rodina" LTD which is one of the chief suppliers of natural milk in the capital market today. Another important project – the construction of a large poultry farm Kazgerkus LTD which is the third in the country by amount of the produced eggs. At the same time the company bought the latest modern equipment due to financing of Kazagro holding. The total cost of the project was 870 million tenges. Kazgerkus became the fourth poultry farm in the Akmola region where such enterprises as Burabaykus LTD, the Izhevsk PC, Akmola-Phoenix LTD have already been functioning.

Thus, the question of food supply of Astana becomes extremely relevant today, being the question of the state importance. And its successful decision will allow to remove many questions, having made a powerful contribution to the development of not only the regional capital, but also the republican market of agricultural products.

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