

MECHANISM OF INTEGRATION AND COOPERATION IN THE INDUSTRY OF MEAT ANIMAL BREEDING ON THE BASIS OF CLUSTERING

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Abstract

The main objective of the research is to develop an optimal mechanism for integration and cooperation processes based on clustering in the livestock industries of the agro-industrial complex (AIC) of Russia. The materials of the study were the reports of agricultural organizations, statistical data from the regions and the Russian Federation. The main methods used in the study are: statistical, economic, monographic, abstract-logical. As a result of the work, the state of integration and cooperation of enterprises of the agro-industrial complex and the identified main factors constraining the formation of meat and food clusters are analyzed. The organizational-economic mechanism of integration and cooperation processes based on clustering in the meat-food sub-complex of the agro-industrial complex, discretely at the state and private levels, is substantiated. A structural model of the meat and food cluster based on the platform of the protoclusters identified in the agro-industrial complex of the region and the missing enterprises being formed (the Cluster Development Center, the Regional Slaughtering and Procurement Points and the Hybrid Selection Center) is proposed. The introduction of these proposals in the practice of the enterprises of livestock industries by optimizing the processes of commodity circulation creates prerequisites for reducing the added value of meat products.

Key words: integration, cooperation, clusterization, rural economy, mechanism

INTRODUCTION

The processes of cooperation and integration are an integral part of the dynamic development of the economy, including the agro-industrial complex. This is explained by the fact that when independent participants of distribution channels act individually on the market, they have to independently carry out sales, price, and other policies and plan marketing activities separately at each level. The participants of the integrated and cooperative structure function as a single organism, coordinating their activities in all areas of production, marketing, etc., which eliminates the duplication of functions. This is especially important for the industry whose products (food) are highly perishable and require special conditions of delivery and storage. Accordingly, optimization of the interaction of enterprises plays a significant

role. At the same time, the experience of the leading countries of the world shows that the most promising form of organization of interaction between various participants in the production, processing and distribution chain of products are agro-industrial clusters [3]. For this reason, at this stage of development, the main role in solving the tasks of ensuring effective functioning and improving the competitiveness of agricultural enterprises in Russia belongs to the development of an optimal organizational and economic mechanism for integration and cooperation processes based on clustering, including in various branches of animal husbandry, which makes the research topic especially relevant and timely.

At present, cluster policy in Russia is based on a complex of regulatory legal acts. By 2018, clusters were already mentioned in 18,034 various legal and regulatory

documents of Russia and the subjects of the Federation. In addition, since 2012, 72 international documents (treaties, resolutions, agreements, etc.) have been signed, in which clusters are mentioned [2, 9]. By 2013, according to the Ministry of Economic Development of the Russian Federation, 221 cluster projects were registered in 58 out of 83 regions of the country or in 70% of the territories, with 41 (19%) in the AIC [10]. In accordance with the classification of M. Enright (4 types of cluster policy according to the level of state intervention - catalytic, supportive, directive, interventionist [12]), today in Russia, supporting cluster policy is practiced at the federal level - financing the creation of cluster development centers and individual events. However, there is still no document containing the norms and rules of a single institutional and economic mechanism of integration and cooperation processes based on clustering in the AIC.

Theoretical and methodological approaches to solving the problems of development of integration, cooperation and clustering processes in the agro-industrial complex are presented in the works of many world-famous economists, among which V. Albino [1], D. Barkley [6], E.M. Bergman [8], E. Jakobsen [23], M. Porter [19], S. Rosenfeld [21], H. Roepke [20], S. Schwaag-Serger [4], W. Strange [22], and others. In many works, practice of developing clusters in the agro-industrial complex of various, especially developing, countries of the world (Brazil and Chile [15], Vietnam [18], Ghana [5], Indonesia [25], Kazakhstan, Kyrgyzstan, Mongolia, Tajikistan and Uzbekistan [11], Moldova [24], Russia [2, 14], Romania [7], etc.).

At the same time, insufficient attention is paid to the elaboration of issues of interconnected transition from integration and cooperation processes to broad clustering of all spheres of the agroindustrial complex, their development and functioning in the system of a single mechanism at the regional level, organizational and economic features and methods of forming specific elements and objects. The problems of interaction between economic entities of the agro-industrial complex with research,

educational and financial-credit institutions remain unresolved. In addition, there is a lack of targeted state regulation of cluster activity on the basis of a single federal mechanism, which forces us to focus on the development of regional projects for their implementation at the sector level.

MATERIALS AND METHODS

In preparing the research, data from the Federal State Statistics Service of the Russian Federation (FSSS), scientific works of Russian and foreign scientists on the cluster topic, materials of research organizations from different countries of the world were used. When studying the theoretical and methodological aspects of the various organizational and economic elements of the development of integration and cooperation processes used monographic and logical methods. Theoretical studies are supported by an analysis of the current state of integration and cooperation in the agro-industrial complex of Russia, based on statistical and economic analysis, as well as by comparing the results of work using the comparative analysis method. The study of practical experience of the enterprises of beef cattle breeding used the methods of sociological research: survey and interviewing. Determining the directions of development and the formation of the mechanism of integration and cooperation processes based on clustering was carried out using abstract logical and design-constructive methods.

RESULTS AND DISCUSSIONS

We have carried out a study of the state of integration and cooperation processes on the example of one of the regions-leaders of agricultural production in Russia - the Saratov region. Enterprises of the livestock industry of the Saratov region play a prominent role in the country's agro-industrial complex and the Volga Federal District of Russia (VFD), which includes 14 regions adjacent to the Volga River. Occupying 15% of the total agricultural area of the Volga Federal District, they contain 8% of the cattle, 19% of sheep

and goats, produce 12% of the total agricultural output of the Volga Federal District (including 8% of milk, 6% of livestock and poultry), and also produce 22% of sausage products.

The results of the study made it possible to determine that in practice the integrated structures of animal husbandry in the Saratov region, depending on the territorial level of integration, can be divided into two main types:

(i) regional - formed by economically strong enterprises within their own or neighboring regions (“Belaya Dolina Group of Companies”);

(ii) federal - large interregional companies, often from Moscow and the Moscow region, with a wide geography of investments (Rumfood Group and CoPITANIA).

The group of companies “Belaya Dolina” focuses only on the development of processing and marketing of livestock products. The group includes a meat processing plant and a dairy plant located in one city of the region (with a total annual revenue of \$ 50 million), 2 trading houses, and a transport company. The total number of employees of enterprises has about 2,000 people (Fig. 1).

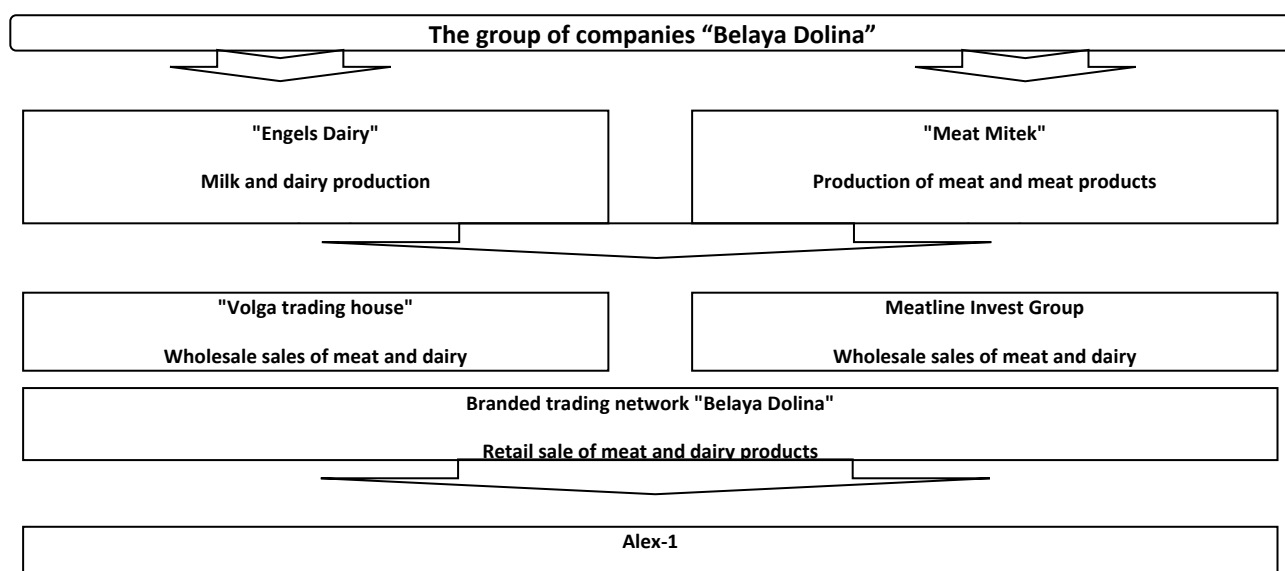


Fig. 1. Organizational structure of the regional agricultural holding “Belaya Dolina Group of Companies”
 Source: Compiled by the authors

The Rumfood Group of Companies is a large agricultural holding from the Ramensky District of the Moscow Region (it takes up to 25% of the market for certain types of meat products in several regions of the Central Federal District and the Volga region) in the region is represented by the Ramfood-Povolzhie pig breeding complex. The total cost of the enterprise is 50 million dollars, the design capacity is 150 thousand heads, it includes a feed mill with a capacity of 25 thousand tons per year. Downhole capacity up to 600 heads or 50 tons of meat per day can produce up to \$ 16.3 million in revenue per year.

The agricultural holding “CoPITANIA” (units

are located in 5 regions of Russia, the total number of employees is 4 thousand people) is represented in the Khvalynskiy Pork Complex. The pig complex consists of 2 divisions in the Khvalynsk and Engels districts of the Saratov region with a total capacity of 65,000 DanBred pigs from Denmark. The pig complex is equipped with modern technological equipment of the Danish company EGEBJERG, which ensures maximum automation of animal housing, annual revenue - \$ 15 million.

At the same time, it has been determined that the agricultural cooperation of small farms (peasant (farmer) households, personal subsidiary farms of the population, individual

agricultural entrepreneurs) is well developed in the region, but in recent years it has shown stagnation. In the period from 2001 to 2012 during the implementation of the Priority National Projects and State Programs for the Development of Agriculture, the number of registered and existing cooperatives increased from 28 to 159 and from 22 to 119 units, respectively. From 2013 to 2017 the number of cooperatives decreased in proportion to the reduction of state support. To date, only 16 cooperatives operate, representing only 20.3% of the total (79) registered. Currently, the Ministry of Agriculture of the region has begun to implement grant support for the development of the material and technical base of 8 processing and marketing agricultural consumer cooperatives at the expense of regional and federal funds totaling \$ 560.8 thousand. The

cooperatives selected as a result of the competition are mainly engaged in procurement and primary meat and milk processing. At the same time, in order to identify shortcomings in the organization of activities of holdings and cooperatives, we analyzed the structure of the formation of the cost of meat products. As a result of the collection and averaging of data on enterprises of the meat and food subcomplex of Russia, we found a significant preponderance of the total trade margin in the cost of the finished product. This indicates a lack of effective interaction and the lack of agreement between the participants of the protocluster, which allows business entities to overcharge their own products at all stages of the production cycle (Fig. 2).

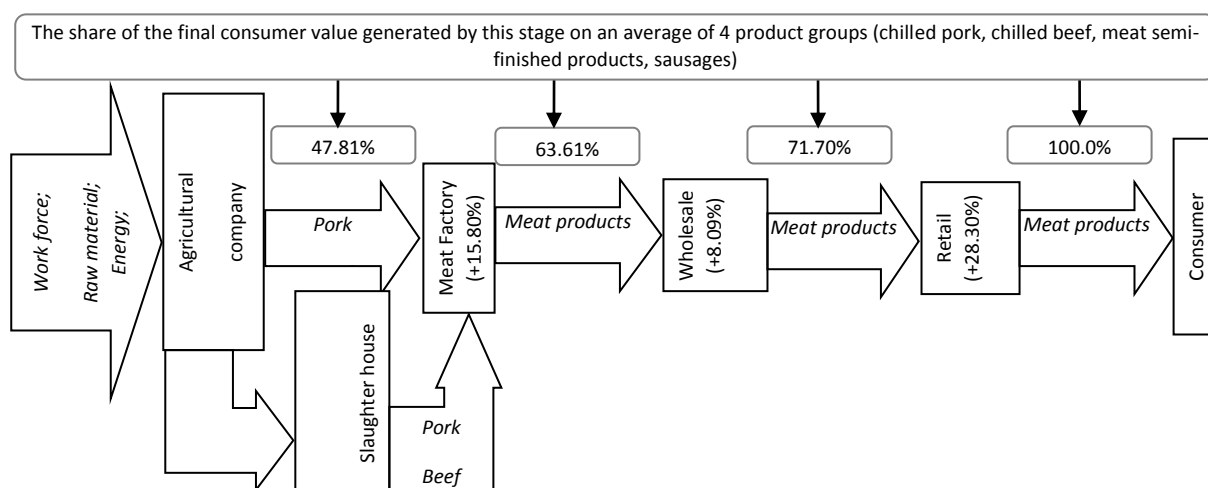


Fig. 2. The existing value-added value chain in the meat product subcomplex of the Saratov region
 Source: Calculated by the authors according to their own data and FSSS data.

In the final selling price, the cost of raw materials received by meat processing plants from agricultural enterprises is slightly less than half, the rest is added at the stages of processing, wholesale and retail trade. A significant proportion of agricultural producers is fair but not insufficient, since the largest costs are in raising and feeding cattle.

Thus, in the course of the research it was revealed that there are key enterprises in the region that are developing towards the formation of a cluster. However, regional clusters in the beef cattle industry are in an embryonic, protocluster state [13]. Today, holdings and cooperatives include in their

structure significant elements of the cluster production core [10]. But at the same time, there is no interaction with the supplying and servicing satellites of the cluster - scientific and educational institutions, financial and insurance organizations, and technical service enterprises. This does not allow to realize all the existing potential for improving the competitiveness and efficiency of enterprises of the meat and food subcomplex.

For these reasons, it is safe to say that today in the industry of beef cattle there is a need to evolve the protocluster into a full-fledged agro-industrial cluster. The essence of this process lies in the evolution of cooperative

and integrated structures in the cluster of beef cattle (Fig. 3).

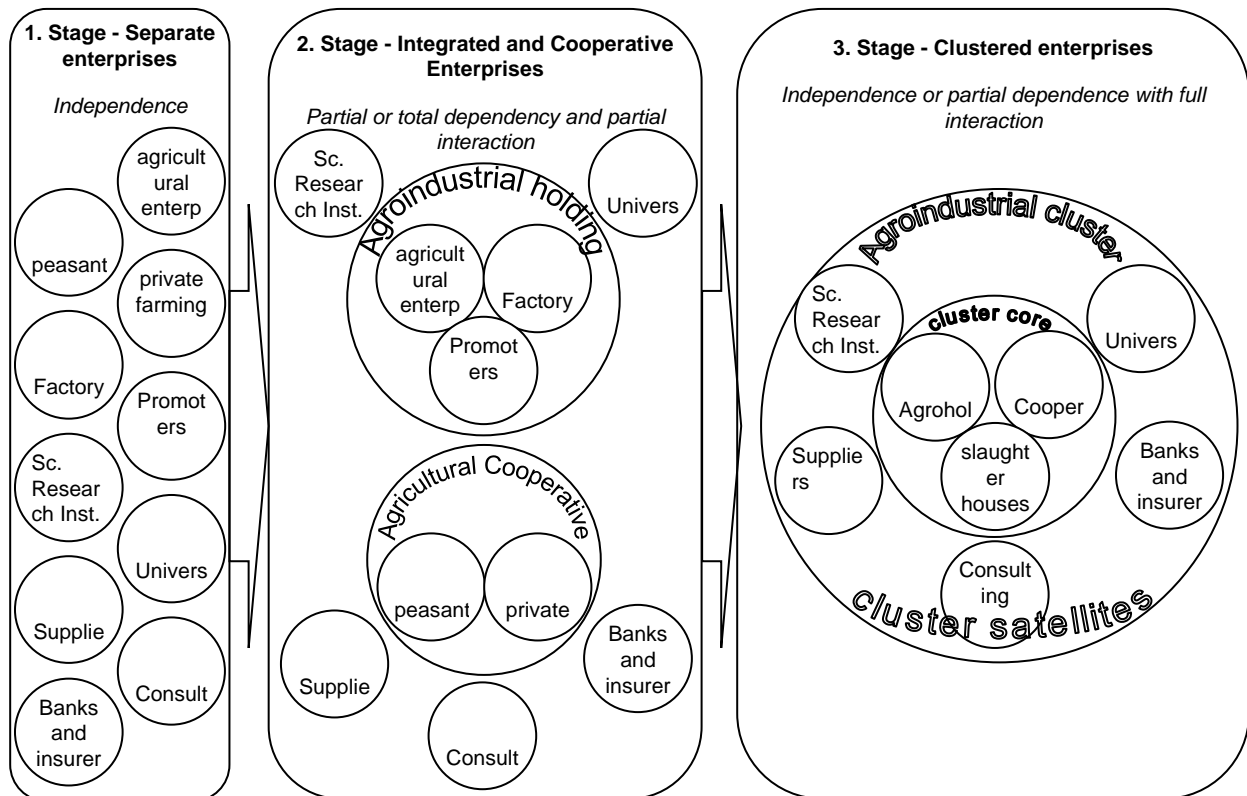


Fig. 3. The three-stage procedure for the development of integration and cooperation of enterprises in the direction of clustering

Source: Compiled by the authors.

In order to support this process, we have formed and substantiated an organizational-economic mechanism, including a phased order of transition from integration and cooperation to the creation of clusters (as a dynamic system) with a functional unit of tasks at the state and private levels (Fig. 4). The mechanism is a structure composed of various forms of organizational (legal, contractual) and financial (cash) elements reflected in the dynamics, that is, in the form of certain processes: integration and cooperation, which constitute the formation of agro-industrial holdings and the integration of the small private farms into agricultural cooperatives [27].

However, despite the significant role of the state in shaping the mechanism of integration and cooperation processes based on clustering, the initiative should come from potential cluster members. Management bodies are encouraged to provide comprehensive support, especially in the initial stages, in the areas of promoting the benefits and designing the cluster.

As a result of the implementation of the proposed mechanism through independent evolution from the protocluster, a full-fledged cluster of beef cattle breeding will appear in the region.

The developed cluster will become a deeply integrated structure focused on expanded reproduction and the implementation of a comprehensive modernization of the existing capacities of the participating enterprises. This will be partly due to the accumulated profit, and partly due to borrowed capital and state support funds [16].

The formed structure of the meat and food cluster takes into account the specifics of the industry, which is expressed in the need to conduct a qualified comprehensive breeding work, increase the genetic potential of animals, and restore livestock on farms (breeding and hybrid centers). It also implies the joint creation by the participants of a sustainable forage base (supplying and servicing satellites) and slaughter and

procuring centers (with the function of primary sanitary and veterinary control and the automated Mercury certification system developed by the Rosselkhoznadzor). It also implies the achievement of high productivity through the most effective combination of factors of production, free

access to information and better coordination of activities (Cluster Development Center). At the same time, the basis of the cluster will be the existing agriholdings with certain characteristics characteristic of the protocluster.

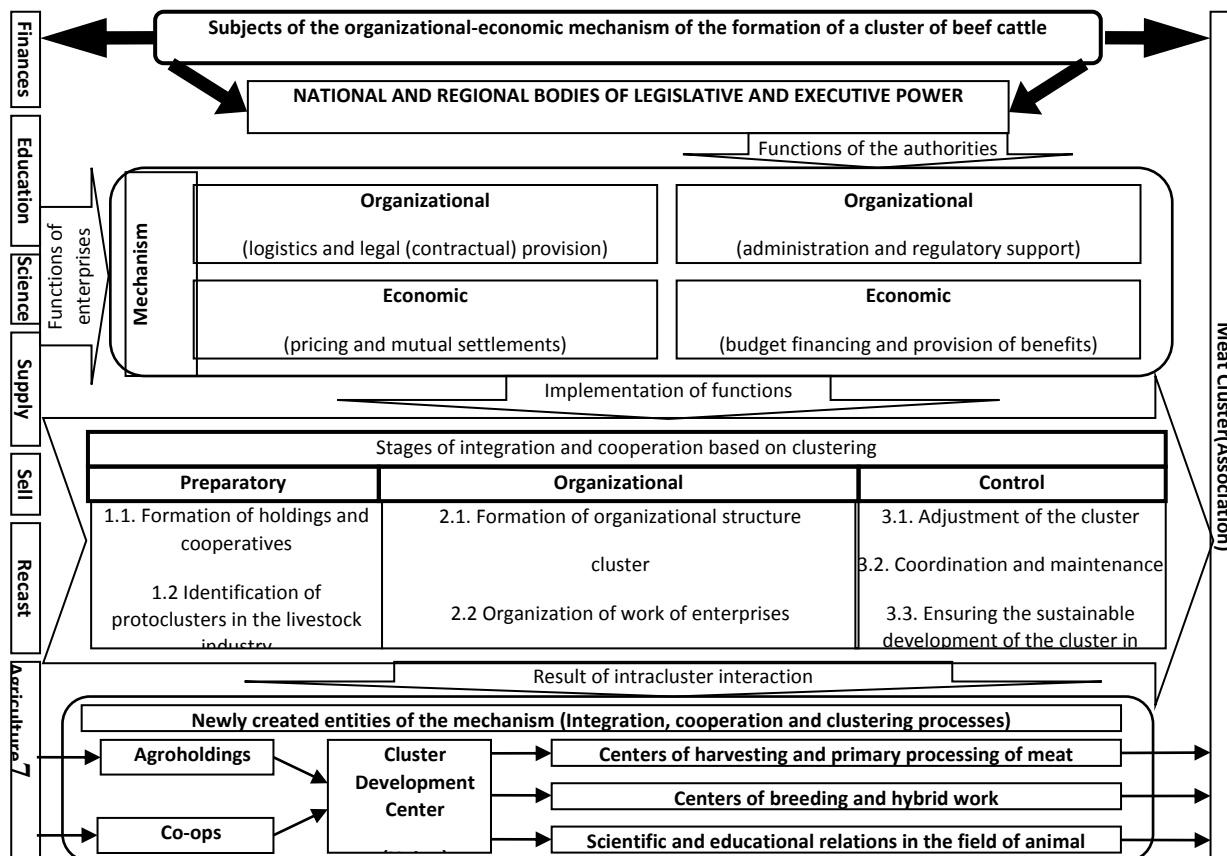


Fig. 4. The organizational and economic mechanism of clustering in beef cattle
 Source: Compiled by the authors.

The composition of the participating enterprises and the model structure of the meat and food cluster is formed (Fig. 5). Building a cluster structure contributes to solving the problem of restoring meat production in small-scale and private farms in the Volga region [17], which is possible today only if they cooperate and integrate with large-scale production, which is characterized by high zoo-sanitary status according to the degree of protection from the introduction and spread of pathogens of especially dangerous diseases (African swine fever, etc.). Within the cluster, there is a rationalization of the processes of expansion, thinning and modernization of product lines of participating enterprises, anticipating

customer demand fluctuations in all markets of presence, acceleration of the process of promoting new products to the market (for example, refrigerated and frozen convenience foods, frozen foods, broths and canned soups). High-tech development of a regional cluster is achieved through the formation of a joint scientific base of participants, concentration of investments on the most profitable and promising innovative projects, operational accommodation to the transformation of consumer preferences, minimization and distribution of high costs and risks associated with the development and implementation of innovations cluster structure [26]. The logistic scheme we compiled allowed us to compare and analyze the cost structures

using the traditional distribution channel and grain product cluster, demonstrating that in the second case the transaction costs are significantly reduced. In the second case, the number of involved transport units is reduced by 1/4 during transportation from the agricultural enterprise and the procurement

center using the same transport, while reducing costs for stockpiling and shipping-loading, and the distributor of the meat processing plant assumes all administrative expenses for processing orders that are also shrinking.

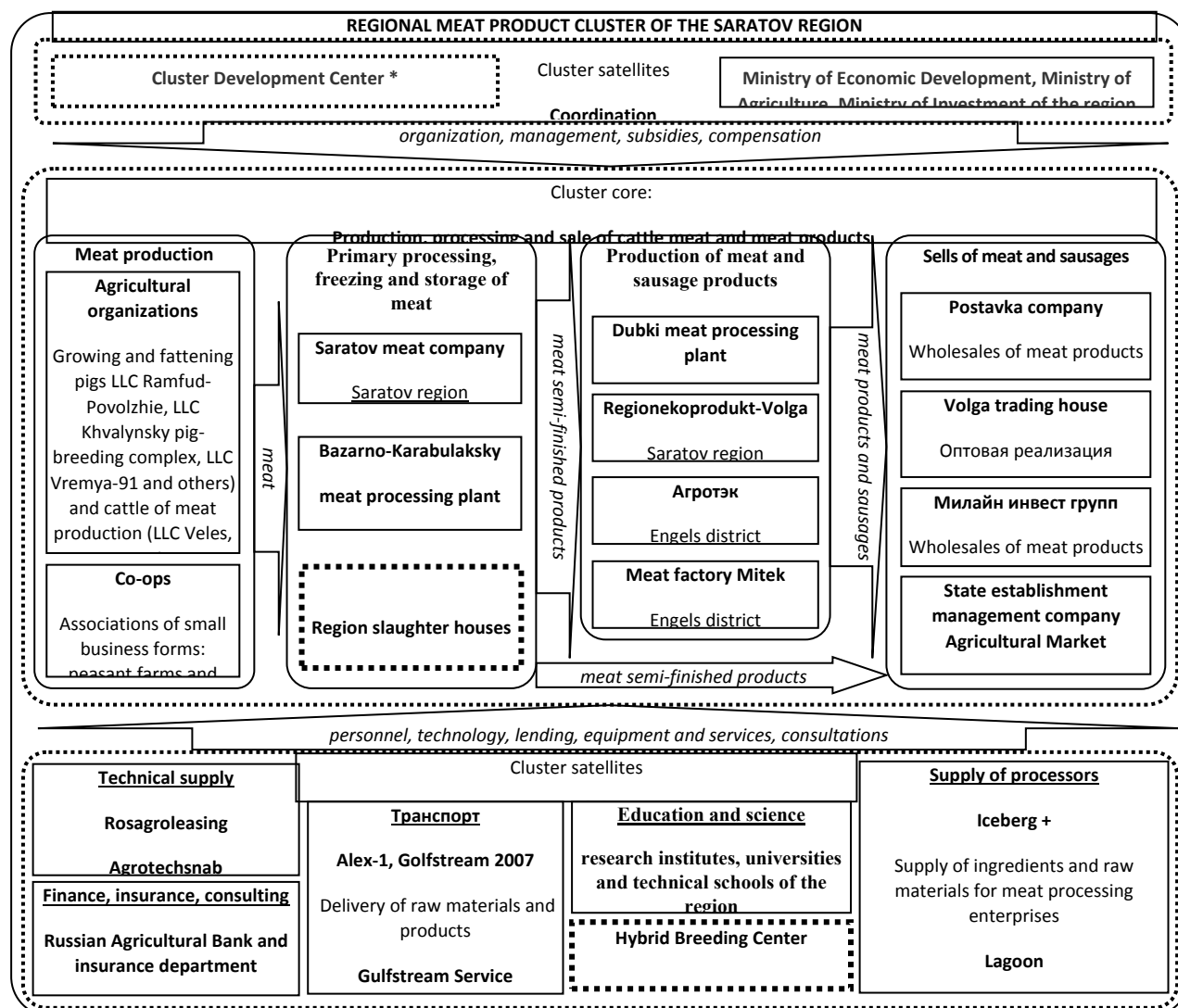


Fig. 5. The structural model of the cluster in the meat product subcomplex of the region (on the example of the Saratov region of Russia)
 Source: Compiled by the authors.

Thus, on the way of meat and meat products from the agricultural enterprise, through the receiving point, processors and network distributor, to the consumer (store) when there are about four commodity exchange contacts, by eliminating duplicate operations and reducing overall costs, the following savings result:

- 11.50% for transportation due to

optimization of transport operation and its sharing;

- 13.0 and 7.50% for warehousing and stocks due to the acceleration of the turnover of goods;
- 2.25 and 3.0% on order processing and administrative expenses through arrangement and planning;
- 1.50 and 2.50% on shipping and handling

and packaging due to its unification or reuse. In this case, the overall savings will be 41.25, depending on the structure of costs for the processes of commodity circulation, which, taking into account their average share of about 25% in the selling price of meat products from the agro-industrial complex, allows reducing the cost of final products by 10.31%.

We also determined the effect in absolute terms on the basis of forecasts for the development of the agro-industrial complex of the Saratov region. Provided that cluster-based methods for organizing production based on the ubiquitous general savings from optimization of commodity exchange processes and stabilization of the regional market for animal products may amount to \$ 112.3 million by 2025. And this, without taking into account the effect of introducing new technologies, creating workers places and increase the receipt of mandatory payments to budgets of all levels.

CONCLUSIONS

As a result, it can be noted that cluster activity is actively developing in the Russian economy, regulations are being adopted, and cluster projects are being developed.

The main base for the formation of clusters can be actively pursuing the processes of integration and clustering of agricultural and processing enterprises. Many agriculture holdings already now represent protocluster structures, including in the structure the supplying, serving and training elements.

The developed mechanism is a complex of organizational and economic measures to optimize the system development of integration and cooperation processes in the direction of clustering. The presented cluster model in the meat product subcomplex reflects the system of production and economic relations of the participants, based on consideration of their economic interests. The model in conjunction with the proposed mechanism is designed to deepen and expand inter-sectoral relations in various areas of the agro-industrial complex. production and

consumer cooperation processes creates opportunities for growth in production and processing of products in small forms of rural entrepreneurship, availability of loans, improvement of sales organization of meat products by the cluster logistics network, ensures the consolidation and diversification of production. Ultimately, the systemic development of integration and cooperation processes will have a positive impact on the well-being of rural residents, economic entities of the industry and the degree of satisfaction of their needs.

Further development of theory and practice will only intensify, as evidenced by the increasing number of works on agroclusters. In these countries, agro-clusters have become the main mechanism for increasing the competitiveness of producers and their products entering international markets. It is safe to say that in the near future the development of theoretical foundations and the practical implementation of clustering processes will become the main direction for improving the competitiveness and efficiency of integration and cooperation of enterprises, regions and states. Thus, integration and cooperation on the basis of clustering serve as a powerful means of achieving the goals of economic policy to improve efficiency, competitiveness and innovative orientation of animal husbandry. In the future, it is territorial production clustering that will become the most important direction of the distribution of productive forces in the agro-industrial complex.

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