

Ways to Increase the Competitiveness of Agricultural Consumer Cooperatives in Modern Conditions

Gulnara Raisovna Chumarina¹ & Olga Alexandrovna Shipshova²

¹ Department of General Management, Institute of Management, Economics and Finance, Kazan Federal University, Russia

² Department of Economics and Innovation, Kazan Cooperative Institute, Russia

Correspondence: Gulnara Raisovna Chumarina, Associate Professor (Department of General Management) Institute of Management, Economics and Finance, Kazan Federal University, Russia. E-mail: nara712@mail.ru

Received: October 9, 2020

Accepted: December 4, 2020

Online Published: January 14, 2021

doi:10.5430/ijfr.v12n2p318

URL: <https://doi.org/10.5430/ijfr.v12n2p318>

Abstract

This paper explores the problem of developing agricultural consumer cooperation enterprises and increasing their competitiveness. According to the authors, the development of agricultural cooperation can give an impetus to increasing the potential of rural areas, will solve the food security problem of the Russian Federation, and stimulate the development of national agriculture. The study identifies the main problems that hinder the development of agricultural cooperation in Russia, including the low competitiveness of these enterprises, insufficient knowledge and poor motivation of the population to create a cooperative movement, the lack of effective state support for agricultural producers from the regional and federal authorities, as well as policies pursued by large retailers, which are mainly aimed at increasing imports of agricultural products. The authors propose a comprehensive approach to solve these problems by highlighting several key priority areas. At the same time, the priority task is to increase the competitiveness of consumer cooperation enterprises and their products. The paper analyses the activities of agricultural consumer cooperation enterprises in the Republic of Tatarstan and offers recommendations to improve the competitiveness of consumer societies, in particular, by creating a wholesale distribution and logistics link for cooperation, reducing costs, and optimizing the assortment.

Keywords: agriculture, consumer cooperation, increasing competitiveness, cooperatives, modern conditions

1. Introduction

Food security is not just a word and a concept, but also affects human life, animal, plant and environmental life. Access to adequate and healthy food reduces hunger and brings health to humans (Taghizadeh-Hesary et al., 2019). It means the hope that about 821 million hungry people in the world will not be hungry anymore. Get rid of almost every ninth person in the world who has a nutritional problem (Kopittke et al., 2019). On the other hand, more food production to alleviate world hunger, endangers the environment, animal and plant life and basic resources (water and soil), and food production cannot be increased beyond the capacity and tolerance of resources and the environment (Pouladi et al., 2019; Pouladi et al., 2020). Further food production will result in the loss of basic resources, natural resources, and environmental pollution, and will incur irreparable costs for current and future generations, and the cycle of resource depletion and reduced food security will continue, and this cycle will continue. Climate change and limited water and soil resources threaten to increase food production. According to the Food and Agriculture Organization of the United Nations (FAO), as the world population reaches more than nine billion by 2050, the world is rapidly becoming more urbanized and richer. Due to the current situation, food preferences are changing so that the downward trend in the consumption of basic carbohydrates and increasing demand for other products such as milk, meat, fruits and vegetables, products that in many parts of the world, they depend on irrigation. It is obvious that the supply of inputs for the production of livestock products depends on pastures and agricultural fields (Adeleye et al., 2015).

Global food demand is expected to increase by about 70% by 2050 and will almost double for developing countries. Assuming we have a world without climate change, to meet global demand for food, the amount of water harvested by agriculture must increase by 11 percent, which means putting more pressure on water consumption. Climate change, such as drought and declining rainfall, has imposed limited water resources on the world. With all these

challenges and obstacles ahead, what can be done to provide food? How can food security be maintained and supported over a period of time (short-term, medium-term and long-term) so that natural resources, infrastructure and the environment are at the lowest cost? The first step is to formulate a food security strategy that pays attention to new and experienced approaches to nutrition in the world and the region and the country. One of these global approaches to combating hunger and ensuring nature-friendly food is to reduce waste and food waste. The Food and Agriculture Organization of the United Nations (FAO) defines food waste at different stages of the food value chain from production, storage, processing to distribution, in which food waste is a food product that is included in the food value chain during the production, storage, processing and supply stages before consumption. In the definition of food waste, any change in quality that leads to the unavailability and unsafe nature of the product and ultimately makes the product inaccessible to humans is considered waste from the perspective of the FAO and the Environmental Program. In this case, the waste that occurs in the final stages of the food value chain, i.e. retail and consumption, is called food waste (Dronin & Kirilenko, 2011).

One of the most important and fundamental issues in the macroeconomy of countries is the issue of meeting the food needs of society or, more scientifically, the food security of that economy. Experts in economics believe that in order to achieve sustainable food security along with efficient policies, the agricultural sector of the economy must be productive and have a proper life and flow (Erokhin, 2017; Sharnin et al., 2019). Also, this sector, considering the potential for job creation, the possibility of earning foreign exchange income through exports, saving foreign exchange expenditures by increasing domestic production, the strategic nature of some of its products, and achieving the goals of the anti-sanctions economy in Western-sanctioned countries. It is one of the sectors in the economy that is directly targeted by governments (Wegren et al., 2017; Hashim et al., 2019). This sector in the economy of the Russian Federation, especially after the tensions between Russia and some of its agricultural suppliers, such as the European Union and Turkey (Tensions between Russia and the European Union due to the accession of Crimea to the Russian Federation in 2014; Tensions between Russia and Turkey have risen sharply since the Turkish military overthrew the Russian Sukhoi 24 in 2015). Russia is moving towards developing this sector in its economy and implementing a policy of import substitution and trade rotation to increase its food security (Karanina et al., 2017; Dibrova et al., 2018; Kulikov & Minakov, 2019; Shegelman et al., 2019).

The value-added of the agricultural sector in the Russian Federation accounted for an average of about 5.3% of the GDP of the Russian economy during the period 1995-2015. As shown in Figure 1, the value-added of the agricultural sector in Russia during the years 1999-2010 and 2014-2015 was higher than the global average. But the growing trend of the share of the agricultural sector in the world and consequently Russia has been towards reducing the value-added share of this sector of the economy (Kuznetsov et al., 2016; Wegren & Elvestad, 2018).

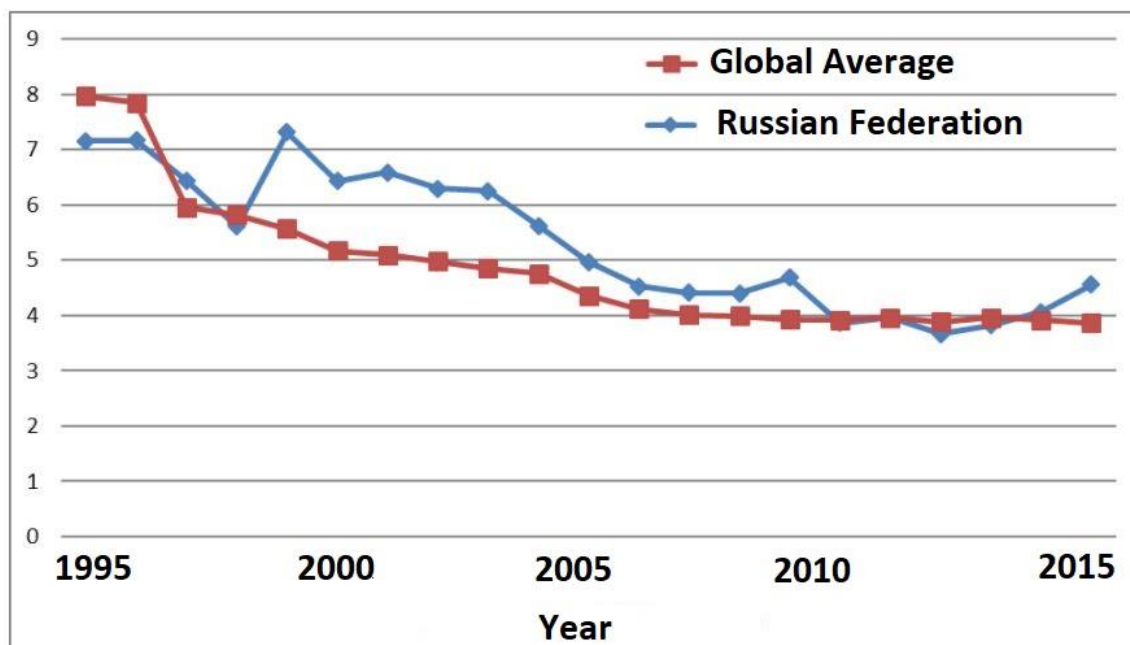


Figure 1. The value-added of the agricultural sector (Global Average and Russian Federation)

Figure 2 can also be presented in terms of the share of employment in the agricultural sector of the Russian Federation. Figure 2 shows the share of employment in the agricultural sector relative to the total employment of this country during the period 1990-2015. According to Figure 2, it can be seen that since the beginning of 2000, the share of employment in the agricultural sector of this country has been declining, which indicates a decrease in the willingness of labour suppliers to work in the agricultural sector, the entry of non-native labour in this sector, Knowledge is the focus of Russia's agricultural sector (capital-oriented rather than labour-oriented agricultural sector) and the weakening of the agricultural sector in the Russian economy (Yalyalieva et al., 2016).

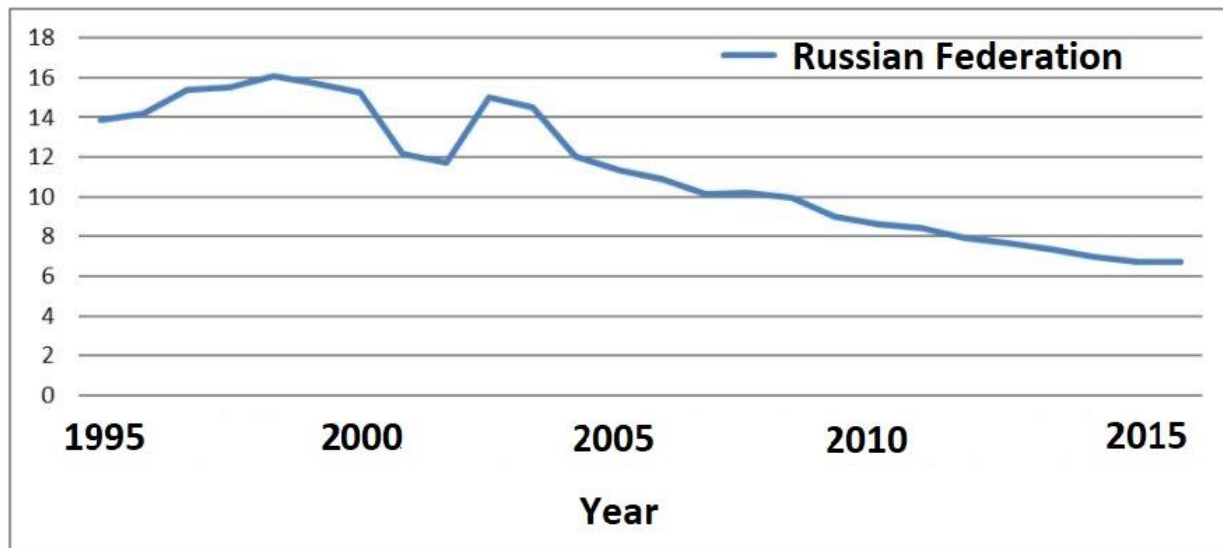


Figure 2. The share of employment in the agricultural sector of the Russian Federation

This paper explores the problem of developing agricultural consumer cooperation enterprises and increasing their competitiveness. It is obvious that the development of agricultural cooperation can give an impetus to increasing the potential of rural areas, will solve the food security problem of the Russian Federation, and stimulate the development of national agriculture. At present, Russia is facing an acute question of maintaining and scaling up such an organizational form of enterprises as agricultural consumer cooperatives (Gorshkova et al., 2020; Nosov et al., 2020). The development of agricultural cooperation can give impetus to increasing the potential of rural areas, solve the problem of food security in the Russian Federation, and stimulate the development of national agriculture. In our opinion, the main problems hindering the development of agricultural cooperation in Russia are the low competitiveness of these enterprises, insufficient knowledge and poor motivation of the population to create a cooperative movement, the lack of effective state support for agricultural producers from the regional and federal authorities, as well as the policies pursued by large retailers which are aimed mainly at increasing imports of agricultural products (Kaldiyarov et al., 2017; Agafonova et al., 2019).

In our opinion, the solution to these problems should be approached comprehensively by highlighting several key priority areas. However, the primary task that the co-operators themselves must solve is to increase the competitiveness of consumer cooperative enterprises and their products. This paper discusses some ways to increase the competitiveness of consumer societies using consumer cooperation in the Republic of Tatarstan as a related example. (Shipshova, 2017; Nosov et al., 2020; Gorshkova et al., 2020).

2. Methods

Considering the importance and position of entrepreneurship, which is called as the engine of the economic and cultural transformation of society; Developing an entrepreneurial culture and supporting entrepreneurs in any country is essential for growth and job creation. In order to strengthen the entrepreneurial spirit, the role of government institutions must be considered. The government can be a major incentive for entrepreneurs by using supportive tools such as cooperatives and financial incentives. Numerous experiences from European countries show that a large part of the achievements of economic development is due to the development of cooperatives, especially through the

creation of small businesses with a group and cooperative nature. Cooperatives allow entrepreneurs to pool their human and financial resources and raise more capital. Entrepreneurs who may not have been able to start a business on their own can create and develop new businesses through better cooperation.

The agricultural sector in most countries of the world acts as an important principle of job creation. This means that in terms of production and employment, it has incomparable growth potentials with other economic sectors. At present, achieving development and employment in all sectors, including the important part of agriculture, is one of the main concerns of many countries in the world. Therefore, paying attention to the development of entrepreneurship and also supporting entrepreneurs in this sector is an undeniable necessity. On the other hand, considering that agriculture is considered as the centre of development in Iran, attention to entrepreneurship in the field of villages and the agricultural sector is doubly important. Agricultural cooperatives play a very important role in the marketing of agricultural products. They can provide product processing and marketing opportunities for agricultural producers. Production cooperatives, by inspecting during production, at harvest time and delivery time, cause uniformity in product quality. Product preparation as a unit reduces the number of farmers with whom the buyer must enter into a transaction. Other benefits of cooperatives are as follows:

- Schedule and schedule delivery
- Assignment of transportation and delivery costs
- Specify the place of delivery
- Safe prices

At present, cooperatives in the world are active in various economic fields, including products and services, and have a significant share in the national economy of countries. Cooperatives engage in economic activities through the accumulation of small and often scattered capital of individuals, and by increasing the share of low-income groups in the production of society, create a proper distribution of income and reduce social inequality. Members of cooperatives learn a lot of experiences through their presence in the field of economic activities with business world relations, financial resources and how to interact with other economic actors, which causes them to grow and improve their individual capabilities. The cooperative approach, in fact, presents new opportunities for individuals and, by equalizing opportunities, prevents deep-rooted struggles with poverty and inequality. The human and social roots of cooperatives, along with economic and material goals, cause cooperatives to focus on human activities and goals (Shamin et al., 2019).

As mentioned earlier, this paper explores the problem of developing agricultural consumer cooperation enterprises and increasing their competitiveness. The initial data of this paper is according to authors' independent conclusions, as well as the results of processing research materials from other authors. This study is based on the thesis that in modern conditions, increasing the competitiveness of consumer cooperative enterprises is possible by the forces of consumer societies themselves and depends on the effectiveness of the management system. The research methodology includes the analysis and structuring of facts supporting this hypothesis.

3. Results and Discussion

The number of peasant (farm) farms in Russia in 2016 was 210.3 thsd, with the total number of organizations of small forms of management equal to 2754.6 thsd. Due to the difficult economic situation in the world, the number of organizations is decreasing. Most experts emphasize that the main problem of the functioning of farms is difficulties with the sale of products. This leads to financial difficulties and the inability of farmers to meet their obligations. Fig. 3 shows the dynamics of the number of agricultural enterprises (farms) in foreign countries in the period from 2010 to 2013 (Gorshkova et al., 2020; Nosov et al., 2020).

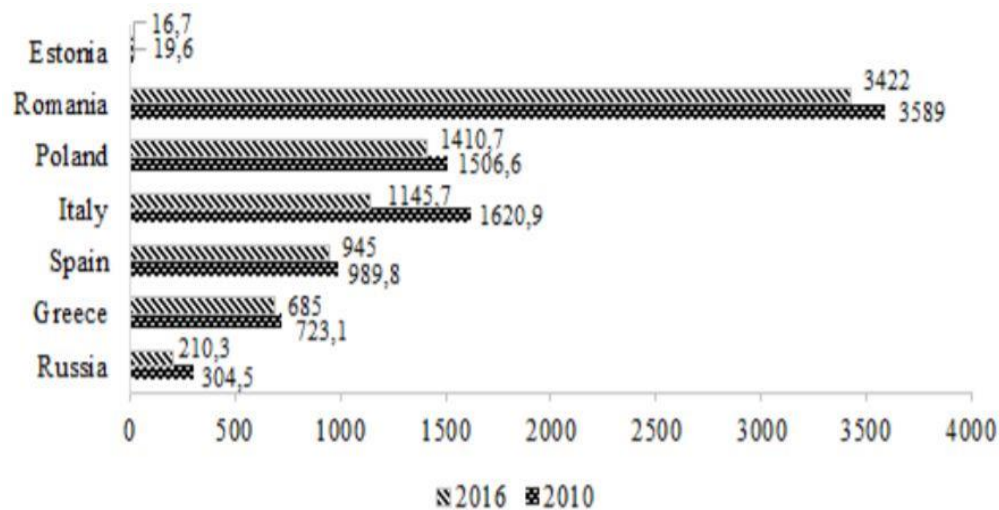


Figure 3. Number of agricultural enterprises (farms)

To increase the competitiveness of agricultural consumer cooperatives, various ways can be considered as

1. One of the problems concerning the low competitiveness of consumer societies is the high expenses of small cooperatives for logistics operations and, as a result, rather high prices for goods that cannot always compete with the dumping pricing policy of retail chains. In this regard, one of the ways to increase their competitiveness is to establish strong bilateral ties between consumer societies and producers, which, in turn, will contribute to a faster and more effective solution to the economic and social problems facing consumer cooperation, the development of the wholesale link of consumer cooperation and logistic improvement processes. In Tatarstan, 56 consumer cooperation enterprises are currently registered; we believe that the creation of inter-district wholesale trade enterprises will help establish cooperative ties, diversify the range of products in retail trade enterprises, and save small cooperatives from the need to maintain a large transport fleet and storage facilities by them (Cooperative competition in a globalized economy, 2018; Astrakhantseva et al., 2019).

When creating a wholesale link in the consumer cooperation system, three main areas related to increasing competitiveness and increasing the social orientation of cooperative entrepreneurship can be distinguished.

- Increase in the wholesale enterprise's competitiveness of consumer cooperation, which will entail the preservation and an increase in jobs in this segment of the economy.
- Increasing the profits and incomes of consumer cooperative enterprises and, as a consequence, increasing in workers and employees' income of the consumer cooperative enterprises.
- Cost reduction of consumer cooperative enterprises, which will contribute to lower retail prices and attract new consumers.

The proposed measures can really support the wholesale link of consumer cooperation and give a new impetus to its development. From an economic point of view, an increase in the role of the wholesale link in the consumer cooperation system will help to reduce the current assets, lower the distribution costs of consumer companies; and thus, as the cost decreases, the wholesale link will be able to increase its real income (Astrakhantseva et al., 2019).

Thus, the wholesale link role in the consumer societies system is one of the integral parts of the organizational, economic and financial activities of consumer cooperation, which contributes to the solution of both economic and social problems.

Important conditions for the normal functioning of the wholesale link are, in turn, centralized supplies, clear planning of sales volumes by consumer companies, and the improvement of the logistics in the field of procurement and supply, which is ensured by organizing procurement through a wholesaler (Chumarina et al., 2019).

We give an example: a particular product of this group is produced by two manufacturers, and four retail outlets are taken for sale. Possible options for the supply of goods can clearly be represented as follows:

- Each cooperative consumer store interacts with the manufacturer without intermediaries, directly, where each

manufacturer is associated with each seller; the number of connections in this scheme is equal to the product of the number of producers and the number of sellers, i.e. $2 \times 4 = 8$;

- Each manufacturer and each consumer is associated with only one wholesale intermediary; the number of connections in this scheme is equal to the sum of the manufacturers' number and the number of consumers, i.e. $2 + 4 = 6$. This distribution scheme is centralized and more efficient, as it reduces the number of actions and relationships that ensure the coordination of supply and demand.

Thus, we have economies of scale in logistics operations by grouping offers from many sellers. A wholesale intermediary is able to perform certain functions to a greater extent than a single manufacturer, and in addition, it can perform additional productive functions such as filling and packaging, storage and delivery of goods. At the same time, the costs of the sales representative of a wholesale company can be distributed among several manufacturers. As a result, the cost of performing the sales function is reduced compared to the option when each manufacturer must have its own supply staff (Chumarina et al., 2019).

Reducing the functional discrepancy between supplies and customers is also ensured by the organization of sales through intermediaries. By purchasing large batches of goods, ensuring their storage and breaking them into smaller batches, wholesalers and retailers enable manufacturers and consumers to deal with more convenient supply scales. In the absence of intermediaries, the manufacturer will have to sell goods in smaller batches in order to adapt to the volume of orders received from individual buyers. In addition, it needs to create inventory, increasing its storage costs. If one organization takes on two different types of activities, such as production and marketing, for which the optimal scales are different, it is forced to implement at least one of these types on a scale that is greater or less than optimal. The consequence of this will be an increase in costs compared with the case when both actions are performed separately at their optimal level. Improving logistics processes will also require additional transport involvement (Fakhrudinova et al., 2019).

2. Also, one way to increase the competitiveness of cooperative organizations is to increase the enterprise's profits in the consumer cooperation system by reducing costs. In our opinion, it is necessary to thoroughly analyse the main expense items in the structure of consumer cooperation. Such a costs analysis will provide an opportunity to study the expense items, which have a higher share in trade costs. This paper will focus mainly on management costs. These include expenses not related to the production or commercial activities of the enterprise. In our opinion, there can be analysed and further sequestered such costs as:

- Remuneration of management personnel. It is necessary to optimize labour costs by reducing staff or by reducing the bonus part of wages. At the same time, optimization should be carried out only in the case of an unjustifiably large number of managerial personnel, or excessive salaries. Analysing the statistics on the payroll and the number of personnel at the enterprises of consumer cooperation in Tatarstan, the following trends can be identified: in 2015, the total number of personnel in consumer cooperation amounted to 3025 people, including 128 managers at various levels, and 127 accounting, financial and economic specialists. In 2019, their total number amounted to 2552 people, including 301 managers at various levels, 152 specialists in accounting; 115 persons are currently engaged in financial and economic work. That is, over five years, with a decrease in the total number of workers in consumer cooperation, the number of managers and accounting specialists is growing. In addition, a reduction in the wage fund can be made by transferring some of the accounting and financial-economic work to outsourcing. This will reduce both the wage fund and tax payments charged on the wage fund.

- Maintenance of administrative buildings and premises. To optimize the costs of maintaining buildings and structures means to reduce them so as not to harm the further operation of real estate. Cost reduction should not lead to a deterioration in the quality of service, claims of property users, reduction in the appraised value of buildings and structures, both in the real estate rental market and in the sale and purchase, etc.;

- Expenses for the purchase of office equipment and stationery. Reducing these costs can be achieved by purchasing a large batch at wholesale prices;

- Travel and hospitality expenses. The appropriateness of representation and travel expenses is estimated by the number of actually completed transactions and the amount of profit from these events;

- Payment for communication services, etc.

It is necessary to analyse these types of expenses. Based on the result, we can identify the most expensive items and possible reserves for reducing these costs and develop measures for their implementation.

3. One of the problems of consumer cooperation enterprises, in our opinion, is a rather narrow range of goods offered.

We believe that it is necessary to actively optimize their assortment by attracting new suppliers and deepening the assortment for various product groups. For example, cooperatives for the production of beekeeping products can diversify their range due to various natural flavours, making whipped honey, making medicinal, cosmetic and biologically active additives from related products, improving product packaging, etc.

In addition to selling food in stationary places of consumption (cafes, canteens), catering enterprises could offer finished products and semi-finished products for sale in shops or cookery departments. To date, the number of consumer enterprises for foodservice and catering in the Republic of Tatarstan is 55, while restaurants - 2, cafes - 28, canteens - 7, buffets - 6, culinary shops - 5, and individual workshops - 6. We believe that it is advisable to increase the number of enterprises for the sale of semi-finished and finished products, which will be in demand among residents in the republic regions by selling goods with low margins.

In addition, it is necessary to evaluate key positions in the assortment, analyse the assortment policy of competitors, monitor dynamic indicators of changes in demand, and increase requirements to the quality of the assortment. Also, consumer cooperative enterprises should modify their pricing policies in view of servicing certain groups of consumers (main people with low incomes) and changes in consumer demand.

4. In order to increase the competitiveness and efficiency of the consumer cooperation enterprise operation, it is possible to recommend minimizing accounts receivable, since an increase in them can lead to serious problems. Proper management of receivables will help to maintain the solvency of consumer cooperatives and prevent a deficit in working capital.

Recommended measures to reduce receivables are:

- Negotiating with debtors to establish the shortest terms for debt repayment and the formation of a compromise solution for both parties concerning the terms of debt payment;
- A written notice requesting the debtor to fulfil its financial obligations;
- Restriction of volumes of supply or termination of customer service until the full repayment of existing debt;
- Appeal to the court to collect debts from debtors.

Consumer cooperation activity is multidisciplinary and multifunctional. Therefore, it is recommended to conduct a financial analysis of each enterprise that is part of consumer cooperation. Based on the results of the analysis, it will be possible to identify the problems of each enterprise and develop more specific recommendations on measures to increase competitiveness for a particular consumer society.

4. Summary

The study allowed us to conclude that improving the competitiveness of agricultural consumer cooperation enterprises can be achieved by various methods, including by creating and developing logistics and wholesale distribution centres for the sale, storage, processing and packaging of agricultural products, optimizing costs and assortment policies, maintaining accounting for financial transactions and minimizing receivables.

5. Conclusions

The problems of developing agricultural consumer cooperation enterprises and increasing their competitiveness have been investigated. This paper explored ways to increase the competitiveness of agricultural products; increase the share of domestic agricultural products in the food market of Russia and improve the financial condition of farmers.

Acknowledgements

The work is performed according to the Russian Government Program of Competitive Growth of Kazan Federal University.

References

- Adeleye, J. O., Adeteye, O. S., & Adewuyi, M. O. (2015). Impact of international trade on economic growth in Nigeria (1988-2012). *International Journal of Financial Research*, 6(3), 163-172.
- Agafonova, E. A., Yashkova, N. V., Frolova, O. A., Kornilova, L. M., & Dmitrieva, A. G. (2019). THE BANKRUPTCY OF AGRICULTURAL COOPERATIVES AS A PHENOMENON. In *Перспективы развития аграрных наук* (pp. 118-120) (In Russian).
- Astrakhantseva, E., Shipshova, O., & Antonova, M. (2019, November). The role of transnational corporations in the globalization of the economy. In *International Conference on Sustainable Development of Cross-Border Regions: Economic, Social and Security Challenges* (ICSDCBR 2019). Atlantis Press.

- Chumarina, G., Mikhailova, M., & Andreeva, Y. (2019). Ensuring competitiveness of advertising in the organization management system. *International Journal on Emerging Technologies*, 10(2a), 101-103.
- Cooperative competition in a globalized economy. *Competitiveness in the global world: economics, science, technology* (2018), 6-2(65), 137-139.
- Dibrova, Z. N., Nosov, V. V., Ovchenkova, G. S., Karpenko, E. Z., Pilyugina, A. V., & Erkovich, E. A. (2018). The main directions of the solution of the problem of food security in Russia. *International Journal of Mechanical Engineering and Technology*, 9(13), 387-394.
- Dronin, N., & Kirilenko, A. (2011). Climate change, food stress, and security in Russia. *Regional Environmental Change*, 11(1), 167-178.
- Erokhin, V. (2017). Self-sufficiency versus security: How trade protectionism challenges the sustainability of the food supply in Russia. *Sustainability*, 9(11), 1939.
- Fakhrutdinova, L. R., Chumarina, G. R., Eidelman, B. M., & Bunakov, O. A. (2019). Cluster approach for development of tourism infrastructure based on the supply chain management in the region. *International Journal of Supply Chain Management*, 8(3), 522-525.
- Gorshkova, D. S., Kutaeva, T. N., Makarychev, V. A., & Mansurov, A. P. (2020, July). Problems of Formation Conditions for the Development of the System of Agricultural Consumer Cooperatives in Russia. In *International Conference on Policies and Economics Measures for Agricultural Development (AgroDevEco 2020)* (pp. 127-131). Atlantis Press.
- Hashim, M. S., Isa, A. M., Menon, A. S., & Nazari, N. M. (2019). The Effect of Tourism Towards the Food Security Issues to the Urban Poor in Sarawak, Malaysia: A Conceptual Approach. *International Journal of Financial Research*, 10(5).
- Kaldiyarov, D. A., Kydyrbayeva, E. O., Shomshekova, B. K., Toregozhina, M., & Baytaeva, G. R. (2017). Cooperation of small forms of managing in agro-industrial sector in the Republic of Kazakhstan. *Revista ESPACIOS*, 38(62).
- Karanina, E., Sapozhnikova, E., Loginov, D., Holkin, A., Sergievskaya, E., & Zurakhovskii, A. (2017). National aspects of food security of Russia. In *MATEC Web of Conferences* (Vol. 106, p. 08079). EDP Sciences.
- Kopittke, P. M., Menzies, N. W., Wang, P., McKenna, B. A., & Lombi, E. (2019). Soil and the intensification of agriculture for global food security. *Environment International*, 132, 105078.
- Kulikov, I. M., & Minakov, I. A. (2019). Food security: problems and prospects in Russia. *Scientific Papers: Management, Economic Engineering in Agriculture & Rural Development*, 19(4).
- Kuznetsov, N. G., Kuznetsov, V. V., & Soldatova, I. Y. (2016). Internal and external factors of food security policy in Russia.
- Nosov, V., Zhenzhebir, V., Nurgaziev, R., Sleptsova, L., & Eryushev, M. (2020). Farming and agricultural consumers' cooperative: challenges and opportunities. In *E3S Web of Conferences* (Vol. 161, p. 01067). EDP Sciences.
- Pouladi, P., Afshar, A., Afshar, M. H., Molajou, A., & Farahmand, H. (2019). Agent-based socio-hydrological modeling for restoration of Urmia Lake: Application of theory of planned behavior. *Journal of Hydrology*, 576, 736-748.
- Pouladi, P., Afshar, A., Molajou, A., & Afshar, M. H. (2020). Socio-hydrological framework for investigating farmers' activities affecting the shrinkage of Urmia Lake; hybrid data mining and agent-based modelling. *Hydrological Sciences Journal*, 1-13.
- Shamin, A., Frolova, O., Makarychev, V., Yashkova, N., Kornilova, L., & Akimov, A. (2019, October). Digital transformation of agricultural industry. In *IOP Conference Series: Earth and Environmental Science* (Vol. 346, No. 1, p. 012029). IOP Publishing.
- Sharnin, A., Frolova, O., Klychova, G., Nigmatullina, N., & Iskhakov, A. (2019). Formation and development of clusters in the Russian regional agro-industrial complex. In *E3S Web of Conferences* (Vol. 91, p. 06005). EDP Sciences.
- Shegelman, I. R., Shchukin, P. O., & Vasilev, A. S. (2019). Analysis of the current situation related to the food security of indigenous population of the Northern Russia. *EurAsian Journal of BioSciences*, 13(2), 663-672.
- Shipshova, O. A. (2017). The innovative component formation of competitive advantages in production systems in

the context of a change in technological structures: monograph. Monograph, Moscow.: KnoRus, p. 142.

Taghizadeh-Hesary, F., Rasoulinezhad, E., & Yoshino, N. (2019). Energy and food security: Linkages through price volatility. *Energy Policy*, 128, 796-806.

Wegren, S. K., & Elvestad, C. (2018). Russia's food self-sufficiency and food security: an assessment. *Post-Communist Economies*, 30(5), 565-587.

Wegren, S. K., Nikulin, A. M., & Trotsuk, I. (2017). The Russian variant of food security. *Problems of post-communism*, 64(1), 47-62.

Yalyalieva, T. V., Nosov, V. V., Volkova, T. S., Tekueva, M. T., & Pavlenko, I. V. (2016). Issues of import substitution in the agro-industrial sector. *Research Journal of Pharmaceutical, Biological and Chemical Sciences*, 7(6), 1620-1624.

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).