Improving commodity lending to the agro-industrial complex as an element of the state support system

K Zhichkin¹, V Nosov²,³,⁴, L Zhichkina¹, M Eryushev⁵, L Sleptsova⁵ and E Udovik⁶

¹ Samara State Agrarian University, 2 Uchebnaja str., Kinel, 446442, Russia
² K.G. Razumovsky Moscow State University of technologies and management, 73 Zemlyanoy val, Moscow, 109004, Russia
³ Peoples' Friendship University, 117198, Moscow, Russia
⁴ Academy of the Investigative Committee of the Russian Federation, 125080, Moscow, Russia
⁵ Saratov State Vavilov Agrarian University, 1, Teatralnaya square, Saratov, 410012, Russia
⁶ Kuban State Technological University, 2 Moskovskaya str., Krasnodar, 350072, Russia

E-mail: zskirill@mail.ru

Abstract. The study relevance is due to the fact that commodity lending is a fairly new procedure for agricultural producers in the state support. The study purpose is to diagnose the mechanisms of commodity lending in the livestock industries in the Samara region AIC and to develop methods for their optimization. Today, the current state of commodity lending is largely a prerequisite for the development of the economy and an integral element of the country's economic growth. At the same time, we propose to introduce a system of control over the use of funds aimed at commodity lending, grants, subsidies, state support, to optimize the purposefulness of the received commodity lending funds, in order to prevent their further use for other purposes. The recommendations will contribute to improving the process of commodity lending to the AIC, both in the medium and long term. Competent organization of the commodity lending process will ensure the uninterrupted and effective work of the SUE SR “Veles”, the Ministry of Agriculture, agricultural producers in the field of commodity lending and, as a result, will strengthen the economy of the region as a whole.

1. Introduction

The relevance of the study is due to the fact that commodity lending is a fairly new procedure for agricultural producers in the field of state support, it is designed to ensure stable development and support of the main agricultural producers, including animal husbandry [1-6].

The need to study commodity lending as one of the measures of state support for the agro-industrial complex (AIC) is determined by the important role of the industry, which it plays as a driver of economic growth of business entities in the industry [7-9]. The problem of finding and introducing the most promising methods of state financing of the agricultural sector is now coming to the fore. The agro-
industrial complex is a sector of the economy, on the effective functioning of which the economic and food security of the state directly depends [10-14].

Agriculture performs the most important social function of the state - it provides the population with food [15-18]. In addition, the strategic importance of the sector has been recognized. The agricultural sector forms a special way of life, different from the urban one, and a large number of Russian citizens have traditionally been employed in agricultural production [19-22].

Figure 1 defines the objectives of commodity lending in the agro-industrial complex. It can be noted that already at the stage of their development, agricultural producers can successfully carry out commodity lending operations, which is especially important in the context of import substitution; it is planned to expand the scope of activities of agricultural enterprises, covering all new infrastructural areas (breeding, quarantine, etc.) [23-28].

2. Methodology

The purpose of the study is to diagnose the mechanisms of commodity lending in the livestock industries in the agro-industrial complex of the Samara region and to develop methods for their optimization. Tasks: - to analyze the state, principles and problems of commodity lending in the agricultural sectors, - to reveal the methods of commodity lending of the agro-industrial complex, - to analyze the trends in the development of the agro-industrial complex in the Samara region, - to analyze commodity lending at agricultural enterprises in the Samara region, - to evaluate budgetary instruments financial mechanism of commodity lending to the agro-industrial complex in conditions of economic instability in the region, - to disclose the methods of commodity lending in the agro-industrial complex as the main factors for increasing their efficiency, - to consider the prospects for commodity lending in livestock farming in the agro-industrial complex, as a way to increase their efficiency and increase the economic potential in the industry as a whole, - to develop proposals for improving commodity lending in the branches of the agro-industrial complex of the Samara region.
The subject of the research is the commodity lending of economic entities of the agro-industrial complex in the Samara region.

The results of the study were tested at the enterprises of the agro-industrial complex of the Samara region in cooperation with the State Unitary Enterprise Samara Region "Veles" and the Rosselkhoznadzor.

3. Discussion and results
Commodity lending has become widespread due to the variety of forms and conditions. Along with the traditional approach - the provision of goods on terms of payment, repayment, urgency, the type of commodity lending is widely used as a form of state support, including in the conditions of agricultural production. This approach was most widespread in the United States, within the framework of the created Commodity and Credit Corporation. It performs a wide variety of functions within the government regulatory system [29-33].

In the Russian Federation, the practice of commodity lending is limited geographically (Tambov, Samara regions and a number of other regions) and functionally (support for the acquisition of commodity and breeding animals for completing the herd) [34-36].

In the context of the development of import substitution mechanisms and an increase in gross and commercial production of livestock products in the Samara region, the question of the development of livestock breeding and access to regional markets is on the agenda.

![Figure 2. The structure of state support in 2017 -2019, brought to the attention of agricultural producers of the Samara region.](image)

The region provides state support to the main livestock producers. The structure of state support in 2017-2019, brought to the attention of agricultural producers of the Samara region, in the context of funding sources is shown in figure 2. As can be seen from the data presented, the main funding comes from the regional budget, while the dynamics of the ratio in 2017-2018 amounted to more than 58%, in 2019 there was an increase in funding from the regional budget to 63%, which is due to the fulfillment of the federal program standards, which led to an increase in the volume of funds issued, while the federal budget funds were accordingly reduced from 42% to 37%. Those the region increases independence in financing agricultural sectors in order to increase the efficiency of its development.

The structure of state support for livestock enterprises in the Samara region by areas and types of production is shown in figure 3. From the data presented, it can be stated that the main directions of state support are associated with the development of the dairy industry (33% + 17%), and the meat sector (16%), a large share of subsidies is aimed at repaying commodity loans (11%). The rest of the enterprises make up less than 5%.
Figure 3. The structure of state support for livestock enterprises in the Samara region by areas and types of production.

Table 1 shows the dynamics of state support for regional producers in 2017-2019 in order to reimburse the costs of reproduction in the livestock industry.

**Table 1.** Funding volumes in 2017-2019, million rubles.

| Period | From the federal budget | From the regional budget | Total  |
|--------|-------------------------|--------------------------|--------|
| 2017   | 76.8                    | 8.5                      | 85.3   |
| 2018   | 142.9                   | 106.7                    | 249.6  |
| 2019   | 131.4                   | 70.8                     | 202.2  |

As can be seen from the data in table 2, the planned indicators were fulfilled during 2017-2019, which indicates the effectiveness of the fulfillment of the set goals in this case.
Table 2. Indicators of the effectiveness of state support in the field of animal husbandry in 2017-2019 (dairy direction).

| Indicators                                                                 | 2017  | 2018  | % completion | 2019  | % completion |
|----------------------------------------------------------------------------|-------|-------|--------------|-------|--------------|
| Sale of pedigree young cattle of dairy and beef breeds per 100 heads of queens, heads | plan  | fact  | % completion | plan  | fact  | % completion |
| Broodstock of sheep and goats in agriculture, peasant farms and individual entrepreneurs, thousand heads | 10.0  | 16.5  | 165.0%       | 10.0  | 11.7  | 117.0%       |
|                                                                               | 15.2  | 15.94 |              | 105.0 |       |              |

One can state a significant increase in the profitability of enterprises in terms of productivity in cattle breeding with the assistance of the state in their activities, since the profitability indicators have increased several times at each enterprise, through state support, unprofitable enterprises reach the level of high profitability.

The main financial and economic indicators of the activities of agricultural organizations and organizations of the agro-industrial complex, which are recipients of state support in 2017 - 2019. Are reflected in table 3.

Table 3. Economic indicators of the main recipients of state support funds of the Samara region (productivity in cattle breeding).

| Subsidized recipients | State support, thousand rubles | Net profit, thousand rubles | Profitability of current activities, % | The ratio of herd productivity to the regional average, % |
|-----------------------|--------------------------------|----------------------------|---------------------------------------|----------------------------------------------------------|
|                       | in this direction | total |                      | with state support | without state support |                                               |
| LLC "Radna"           | 41374.0           | 83045 | 74636               | 23.2                  | -2.6                 | 130                                       |
| State Unitary Enterprise SR "Kupinsky" | 17997.1           | 24845 | 5731               | 3.6                  | -12.2                | 145                                       |
| Home Farm LLC         | 6065.4            | 32448 | 31009              | 22.2                  | -1.0                 | 123                                       |
| LLC SHPK Olginisky    | 12054.7           | 22620 | 17797              | 5.8                  | -1.6                 | 159                                       |
| JSC "Niva"            | 14784.3           | 34171 | 11458             | 4.6                  | -9.1                 | 168                                       |
| LLC SHP "Eco-Product" | 31897.3           | 70922 | 49188           | 16.5                 | -7.3                 | 193                                       |

As a result of state support for livestock enterprises, an increase in the revenue of subsidized enterprises was obtained by 34.3%, while the cost price increased by 24.4%, state support for three years was made in unequal payments and in 2019 it was reduced, as enterprises were able to partially invest their own funds, which ultimately led to an increase in profits by 56.7% and contributed to an increase in profitability from 20.5% to 24.6%, and the share of state support funds was reduced from 37.8% to 24.1%. Consequently, the state support had a positive result on the development of animal husbandry in
the region and made it possible to increase the attractiveness of animal husbandry enterprises in the region.

In the Samara region, the use of commodity lending in agriculture is still limited to two main areas. The first is a commercial loan at the level of economic entities (provision at the beginning of the season of seeds, agricultural fertilizers, fertilizers, etc., and settlement at the end - in money or finished products) [37].

The second is commodity lending with state support through the State Unitary Enterprise SR “Veles”. Within the framework of this direction, the state (represented by the State Unitary Enterprise) provides breeding or commercial livestock to agricultural enterprises in the region. At the end of the loan term, the organization must return one head of livestock. In this case, the annual payment is 5% of the book value of the original head. At the same time, one of the strategic goals is achieved - maintaining and increasing the number of livestock in the region.

The system of commodity lending has shown itself to be quite effective, as follows from the data in table 4.

Table 4. The main financial and economic indicators of the activities of agricultural organizations and organizations of the agro-industrial complex, which are recipients of state support in 2017 - 2019.

| Indicators                        | 2017     | 2018     | 2019     | Growth rate,% |
|----------------------------------|----------|----------|----------|---------------|
| Revenue, million rubles          | 29389.2  | 36727.3  | 39479.3  | 134.3         |
| Cost, million rubles             | 24619.5  | 28170.6  | 30621.8  | 124.4         |
| State support amount, million rubles | 1804.4   | 1939.5   | 1798.4   | 99.7          |
| Net profit, million rubles       | 4769.7   | 6778.3   | 7473.2   | 156.7         |
| Profitability of the agro-industrial complex,% | 20.5     | 23.8     | 24.6     | 120.0         |
| Share of state support in net profit,% | 37.8     | 28.6     | 24.1     | 63.8          |

In order to support the development of the agro-industrial complex in the Samara region, it was possible to bring the development of animal husbandry in the region to a new level and provide an opportunity for producers to increase their competitiveness in the regional market. At the same time, in order to further increase the efficiency and profitability of the livestock industry in the Samara region, it is necessary to consider the prospects for the development of commodity lending in the new economy and the timely adoption of anti-crisis measures.

The main strategic directions of development of SUE SR "Veles" in the short term are shown in figure 4.

**Figure 4.** Dynamics of changes in the number of cattle in the Samara region in terms of commodity lending in 2017-2019.
To avoid losses to agricultural producers from a possible redistribution of the food market of the Russian Federation in favor of large companies in commodity lending, it is necessary to integrate the veterinary system of the Rosselkhoznadzor "Mercury" into the work of the SUE SR "Veles". This will allow, in the shortest possible time, to receive reliable information about the condition of commodity producers, which are included in the database of possible recipients of a commodity credit in the veterinary system (figure 5).

With the introduction of this system in the SUE SR "Veles" the list of information consumers will increase, the activities of agricultural enterprises will become more open, which will optimize the system of commodity lending for the next few years and will ultimately lead to an increase in the financing of the industry in the region.

![Diagram of strategic directions of development of SUE SR "Veles".](image)

**Figure 5.** Strategic directions of development of SUE SR "Veles".
It is planned to increase livestock productivity by 15-20% in comparison with current indicators by financing new livestock production in the direction of production of feedlots.

For this, the SUE SR “Veles”, together with private investors, is developing a project that provides for two stages of implementation:

1. At the first stage, build (reconstruct) a complex of buildings for the production of beef meat in accordance with modern requirements
2. At the second stage, to expand the complex of buildings for the production of beef meat according to the final production capacity of 12,000 tons/year.

To implement the project, investments of 2.7 billion rubles will be required. The structure of the current expenses of the agricultural complex is shown in table 5.

Table 5. Structure of current expenses of the agricultural complex.

| Indicator | Value |
|-----------|-------|
| Electricity costs, thousand rubles | 35000 |
| Gas expenses, thousand rubles | 305999 |
| Total one-time costs, thousand rubles | 340999 |
| Electricity costs, thousand rubles/quarter | 2484 |
| Gas expenses, thousand rubles/quarter | 2196 |
| Water costs, thousand rubles/quarter | 2250 |
| General operating expenses, thousand rubles/quarter | 12000 |
| Payroll expenses, thousand rubles/quarter | 19581 |
| Total fixed costs, thousand rubles/quarter | 38511 |
| Transportation costs, % of revenue | 2.77 |
| Advertising, % of revenue | 0.01 |
| Unforeseen expenses, % of revenue | 2 |
| Feed costs, % of revenue | 36.61 |
| Consumables, % of revenue | 10 |
| Total variable costs, % of revenue | 51.39 |

The performance indicators of the joint project of the SUE SR "Veles" with private investors to expand the production of a livestock farm are shown in table 6.

Table 6. Performance indicators of the joint project of the SUE SR "Veles" with private investors to expand the production of a livestock farm.

| Indicator | Value |
|-----------|-------|
| Net income (NCF), thousand rubles | 4284265 |
| Net present value (NPV), thousand rubles | 866670 |
| Simple payback period (PB), g | 4.96 |
| Discounted payback period (DPB), g | 6.50 |
| Profitability Index (PI) | 2.13 |
| Internal rate of return (IRR),% | 27.3 |
Figure 6. Break-even point of the agricultural complex, thousand rubles.

In figure 6 shows the breakeven point of the project.

4. Conclusions

Today, the current state of commodity lending to the agro-industrial complex is largely a prerequisite for the development of the economy and an integral element of the country's economic growth.

At the same time, we propose, in order to increase the efficiency of commodity lending in the agro-industrial complex of the Samara region, to introduce a system of control over the use of funds aimed at commodity lending, grants, subsidies, state support, to optimize the purposefulness of the received commodity lending funds, in order to prevent their further use for other purposes.

The proposed recommendations, in our opinion, will contribute to improving the process of commodity lending to the agro-industrial complex in modern conditions, both in the medium and long term. Competent organization of the process of commodity lending, taking into account all possible directions for improving this activity, will ensure the uninterrupted and effective work of the SUE SR “Veles”, the Ministry of Agriculture of the region, agricultural producers of the agro-industrial complex in the field of commodity lending and, as a result, will strengthen the economy of the region as a whole.

References

[1] Nosov V V, Zhichkin K A, Zhichkina L N, Novoselova S A, Fomenko N L and Bespamjatnova L P 2020 IOP Conference Series: Earth and Environmental Science 548 022077 doi:10.1088/1755-1315/548/2/022077
[2] Frolova I I, Nosov V V, Zavyalova N B, Dorofeev A E, Vorozheykina T M and Petrova L I 2020 Entrepreneurship and Sustainability 7(3) 2228–42 doi:10.9770/jesi.2020.7.3(51)
[3] Carolan M S 2013 Sociologia Rurals 53(4) 413-31 doi: 10.1111/soru.12020
[4] Titorenko K V and Zhichkin K A 2021 IOP Conference Series: Earth and Environmental Science 723 032003 doi:10.1088/1755-1315/723/3/032003
[5] Katchova A L and Ahearn M C 2017 Agricultural Finance Review 77(1) 50-63 doi: 10.1108/AFR-03-2016-0021
[6] Prodanova N A, Savina N V, Dikikh V A, Enina Y I, Voronkova O Y and Nosov V V 2020 Entrepreneurship and Sustainability 7(3) 2227-81 doi: 10.9770/jesi.2020.7.3(54)
[7] Emery S B 2014 Agriculture and Human Values 32(1) 47-61 doi: 10.1007/s10460-014-9520-8
[8] Robinson G M 2018 Annual Review of Resource Economics 10 133-60 doi: 10.1146/annurev-
resource-100517-023303

[9] van Dinh D 2020 Management Science Letters 10(5) 1001-10 do: 10.5267/j.msl.2019.11.010
[10] Nazlioglu S and Soytas U 2012 Energy Economics 34(4) 1098-104 do: 10.1016/j.eneco.2011.09.008
[11] Bastiaens I and Postnikov E 2017 Environmental Politics 26(5) 847-69 do: 10.1080/09644016.2017.1338213
[12] Rezitis A N 2015 International Review of Applied Economics 29(3) 403-34 do: 10.1080/02692171.2014.1001325
[13] Carolan M 2017 Sociologia Ruralis 57(2) 135-54 do: 10.1111/soru.12120
[14] MacDonald G K, Brauman K A, Sun S, Carlson K M, Cassidy E S, Gerber J S and West P C 2015 BioScience 65(3) 275-89 do: 10.1093/biosci/biu225
[15] Zhichkin K, Nosov V, Zhichkina L, Tarakanov A, Zhenzhebir V and Sterlikov F 2020 IOP Conference Series: Materials Science and Engineering 941 012025 do:10.1088/1757-899X/941/1/012025
[16] Baimisheva T A, Kurmaeva I S, Gazizyanova Y Y, Baimeshev R H and Aiesheva G A 2019 IOP Conference Series: Earth and Environmental Science 315 22090 do: 10.1088/1755-1315/315/2/022090
[17] French J 2019 Agribusiness 35(2) 219-33 do: 10.1002/agr.21597
[18] Picardy J A, Pietrosemoli S, Griffin T S and Peters C J 2019 Renewable Agriculture and Food Systems 34(1) 7-19 do: 10.1017/S1742170517000230
[19] Ball E V, Wang S L, Nehring R and Mosheim R 2015 Applied Economic Perspectives and Policy 38(1) 30-49 do: 10.1093/aep/ppv031
[20] Khayrzoda S, Morkovkin D, Gibadullin A, Elina O and Kolchina E 2020 E3S Web of Conferences 176 05007 do: 10.1051/e3sconf /202017605007
[21] Zhichkin K, Nosov V, Zhichkina L, Levina N, Lobacheva T and Pokidov B 2021 IOP Conference Series: Materials Science and Engineering 1079 072029 do:10.1088/1757-899X/1079/7/072029
[22] Rusiana H, Brewer B and Escalante C 2017 Agricultural Finance Review 77(1) 153-63 do: 10.1108/AFR-03-2016-0026
[23] Ball E, Schimmelpfennig D and Wang S L 2013 Applied Economic Perspectives and Policy 35(3) 435-50 do: 10.1093/aep/ppt014
[24] Zhichkin K, Nosov V, Zhichkina L, Badanin E, Voloshchuk L and Kotar O 2020 E3S Web of Conferences 217 09004 https://doi.org/10.1051/e3sconf /202017909004
[25] Morkovkin D E, Kolosova E V, Sadriddinov M I, Semkina N S and Gibadullin A A 2020 IOP Conference Series: Earth and Environmental Science 507 012023 do: 10.1088/1755-1315/507/1/012023
[26] Johnson A M, Boehlje M D and Gunderson M A 2017 Agricultural Finance Review 77(1) 164-80 do: 10.1108/AFR-06-2016-0057
[27] Morkovkin D, Hutarava I, Ogloblina E, Gibadullin A and Kharchenko S 2020 E3S Web of Conferences 176 05002 do: 10.1051/e3sconf /202017605002
[28] Zhichkin K, Nosov V, Zhichkina L, Panchenko V, Zueva E and Vorob'eva D 2020 E3S Web of Conferences 203 05022 https://doi.org/10.1051/e3sconf /202020305022
[29] Serra T, Goodwin B K and Featherstone A M 2011 Journal of Econometrics 162(1) 18-24 do: 10.1016/j.jeconom.2009.10.005
[30] Abramov V L, Kozorov V A, Gibadullin A A, Nezamaikin V N, Borisov O I and Lapenkova N V 2020 Journal of Physics: Conference Series 1515 032025 do: 10.1088/1742-6596/1515/3/032025
[31] Dodson C B and Ahrendsen B L 2017 Agricultural Finance Review 77(1) 78-94 do: 10.1108/AFR-05-2016-0046
[32] Zhichkin K A, Nosov V V, Zhichkina L N, Pavlyukova A V and Korobova L N 2021 IOP Conference Series: Earth and Environmental Science 659 012005 doi:10.1088/1755-
1315/659/1/012005

[33] Peckham J G and Kropp J D 2012 *Agricultural and Resource Economics Review* 41(2) 158-74
doi: 10.1017/S1068280500003324

[34] Featherstone A M 2018 *Applied Economic Perspectives and Policy* 40(1) 136-54
doi: 10.1093/aepp/ppy001

[35] Medvedeva T N, Artamonova I A, Baturina I N, Farvazova E A, Roznina N V and Mukhina E G
2019 *IOP Conference Series: Earth and Environmental Science* 341 012010
doi:10.1088/1755-1315/341/1/012010

[36] Carlin R E and Hellwig T 2020 *Journal of Politics* 82(2) 786-99
doi: 10.1086/706108

[37] Lencucha R, Pal N E, Appau A, Thow A-M and Drope J 2020 *Globalization and Health* 16(1) 11
doi: 10.1186/s12992-020-0542-2