Potential for the development of consumer cooperation in dairy cattle breeding in the region

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Abstract. The purpose of the study is to identify the municipalities of the Altai region, which is one of the leading agrarian regions of Russia, with the development potential for cooperation of small forms of farming in dairy cattle breeding. It was found that in conditions of a decrease in the number of cows in all categories of management, the proportion of municipalities in the region that have the highest and high potential for the development of consumer cooperation increases (in 2007 this group included 54.0% of all municipalities of the region, then in 2020 more than 69.8%). However, this potential has not been realized, which significantly reduces the possibility of stabilizing and increasing milk production in the region. It was concluded that consumer cooperation develops only with government support and by proactive entrepreneurs. In the areas with suitable agrarian infrastructure for the pooling non-profit associations of milk producers, the necessary infrastructure, organizational and educational conditions should be developed.

Agricultural consumer cooperation is the mechanism that, on the one hand, allows entrepreneurs with small production volumes to benefit from scale up production, when combined as a whole or in separate production processes (supply, production, storage, marketing, primary or deeper processing of products), On the other hand, compete with large milk producers, often part of agricultural holdings of local, regional, interregional or federal significance. In many regions of the Russian Federation, the relevance of the development of agricultural cooperation is determined by the presence of many small consumer, small-scale or commodity farms of the population and peasant (farmer) households, individual entrepreneurs. However, the development of cooperation in the production of milk in small forms of farming is not always determined by the concentration of production in individual territories.

Many experts and researchers in the field of agricultural economics characterize the establishment of households as a form of manifestation of crisis phenomena in the agricultural economy, while recognizing that an increase in production in personal subsidiary plots made it possible to provide additional income for rural residents and food supply for Russia. Kalugina Z.I. quite reasonably defines the dairy production of agricultural production as an institutional trap in the market transformation of agro-industrial production [1]. A fairly widespread opinion was expressed by Lysenko E.G., that in
conditions of stabilization in the agrarian economy, the importance of households of the population will decrease, most of the large-scale households will be transformed into peasant (farmer) households [2]. One of the main conditions for the development of households is the development of production and marketing cooperation of small businesses [3, 4], the development of niche industries [5, 6], the development of a system of relationships with agricultural organizations, food industry enterprises on a contract basis, when business entities interact on the basis of concluded contracts with the main parameters of manufactured products (production technology, volumes and quality of products, price, delivery time, etc.). Abroad, it is contractual integration into the agro-industrial complex that is developed, numerous family farms, as a rule, are united into cooperatives [7, 8, 9, 10, 11]. In Russia, there are reverse processes associated with the forced holding of agricultural production. At the same time, the research results of Siptitsa S.Yu. and Gataulina E.A. prove that large enterprises tend to displace small forms of business from the market [12], thereby predetermining the “impoverishment of consumer choice” in food markets, since large-scale production is not interested in a prompt response to structural changes in consumer preferences [13].

The theoretical basis of the research carried out was the results of research by scientists in the field of the development of small forms of management in the agrarian economy. The statistical grouping of the municipalities of the Altai region to identify the potential for the development of dairy cattle breeding was carried out on the basis of the data of the municipal statistics database of Altaikraistat according to the criterion “Livestock of cows at the end of the year” in the context of various categories of farming. All municipalities of the region were divided into 5 groups according to the level of cooperation potential of small forms of farming in milk production: low level (the proportion of cows kept in households did not exceed 15.0% of the total number of cows in all categories of farming); relatively low (from 15.0% to 48.0%); medium (from 48.0% to 52.0%); high (from 52.0% to 85.0%); the highest (over 85.0%). In fact, for the analyzed period in the Altai region there were no municipalities with a low level of cooperation potential. A similar approach was used by Kotomina M.A., who carried out a statistical group of municipalities according to the criterion of the ratio of the difference in the number of cows in small forms of farming and agricultural enterprises to the total number of cows contained in all categories of farming [14]. To analyze statistical data, we used the standard Microsoft Office 2007 software package, including the Microsoft Excel analysis package and its Pivot Table service. The sources of statistical information were Rosstat, the territorial body of Rosstat in the Altai region and the Altai Republic, data from the Ministry of Agriculture of the Altai region.

The Altai region is the average statistical region of Russia in terms of the development level of household farms: the share of this category of farms in gross output in 2019 was 26.2% (on average in Russia, 28.1%). It belongs to a group of 22 regions, which together produced 20.8% of the total gross output of households. In total, as of January 1, 2021, households held 40.8% of the total cattle population (278.9 thousand heads, which is 1.53 times lower than the 2000 level), including 44.8% of cows (127.9 thousand heads, which is by 1.85 times lower than in 2000), 57.6% of pigs (228.0 thousand heads, which is 2.14 times lower than in 2000), 76.8% of sheep and goats (143.7 thousand heads, which is 1.44 times lower than in 2000) , 46.2% of horses, 93.4% of bee colonies (170.2 thousand bee colonies, which is 4.50 times higher than in 2000).

The indicated changes in the livestock and poultry population, the number of bee colonies in the households of the Altai region against the background of the recovery in the production of pigs and poultry in the large-scale sector of the agrarian economy led to structural shifts in production: for the period 2000-2020 the share of this category of farms in milk production decreased by 5.70 percentage points, livestock and poultry meat, eggs by 29.48-32.68 percentage points, increased for wool and commercial honey by 38.22 and 27.80 percentage points, respectively (Table 1). At the same time, households remained the main producers of commercial honey, potatoes, vegetables, wool (68.70-91.52% of the regional volume), cattle and poultry meat, and milk (37.61% and 46.33%, respectively).
In 2006-2019 more than 104.0 thousand households of the Altai region were engaged in the sale of surplus milk, meat of cattle, pigs. In absolute terms, the volume of products sold annually was at the level of 160.0-213.7 thousand tons for milk and 73.8-131.9 thousand tons of meat for a total amount of over 126.2 billion rubles (according to 2019 data, on average, one farm accounted for about 87.1 thousand rubles). At the same time, sales volumes by years vary insignificantly: the standard deviation of milk sales volumes for the period 2006-2019 is amounted to 13.6 thousand tons (the coefficient of variation did not exceed 6.72%), for meat of livestock and poultry was at the level of 14.56 thousand tons (the coefficient of variation did not exceed 14.58%). The growth rate of income from sales of products amounted to 178.7% in nominal terms, and in real terms (taking into account the adjustment of nominal indicators for the inflation rate) lower by 1.47 times. Despite the observed increase in the marketability of production, the bulk of the products produced in households of the population were spent on personal consumption by household members. Low marketability hinders the integration of the region's agriculture into the system of interregional and international trade relations. In the context of the gradual holding of agricultural production in the Altai region low marketability hinders the development of small businesses and small businesses in the countryside.

Of the 63 analyzed municipalities of the Altai region, 49 territories (77.7% of the total number of municipalities) in 2020 had either medium, high or the highest potential for cooperation in milk production in small forms of farming, in which the number of cows in households and peasant (farm) households was comparable to or exceeded the number of cows in agricultural organizations (Table 2).

Table 2. Number of cows in small forms of farming in the Altai region per 1 municipality a.

| Indicators                      | Share of livestock in small forms of farming, % of the total livestock | 2007 | 2010 | 2015 | 2020 total | % to 2007 |
|---------------------------------|------------------------------------------------------------------------|------|------|------|-------------|-----------|
| Number of municipalities, pcs. |                                                                        | 15.0...48.0 | 26 | 25 | 17 | 14 | 53.8 |
|                                 |                                                                        | 48.0...52.0 | 3 | 4 | 4 | 5 | 166.7 |
|                                 |                                                                        | 52.0...85.0 | 33 | 31 | 35 | 29 | 87.9 |
|                                 |                                                                        | 85.0...100.0 | 1 | 3 | 7 | 15 | 15.0 times |
| Share of municipalities, % of   |                                                                        | 15.0...48.0 | 41.3 | 39.7 | 27.0 | 22.2 | x |
| the total number of municipalities |                                                                        | 48.0...52.0 | 4.8 | 6.3 | 6.3 | 4.8 | x |
|                                 |                                                                        | 52.0...85.0 | 52.4 | 49.2 | 55.6 | 11.1 | x |
|                                 |                                                                        | 85.0...100.0 | 1.6 | 4.8 | 46.0 | 23.8 | x |
| Livestock of cows per 1         |                                                                        | 15.0...48.0 | 2576 | 2431 | 1847 | 2139 | 83.0 |
| municipality, head              |                                                                        | 48.0...52.0 | 3873 | 3449 | 3637 | 2240 | 57.8 |
|                                 |                                                                        | 52.0...85.0 | 3566 | 3538 | 3032 | 3319 | 93.1 |
|                                 |                                                                        | 85.0...100.0 | 370 | 1177 | 2027 | 1960 | 5.3 times |

a Source: authors' calculations based on Altaykraistat data (https://gks.ru/dbscripts/munst/munst01/DBIinet.cgi)
In 2020, the group of municipalities with the highest development potential for the consumer cooperation included municipal districts and/or cities: Pankrushikhinsky, Soloneshensky, Kamensky, Kamensky / Kamen-na-Obi, Kalmansky, Uglovsky, Yeltskovsky, Petro pavlovsky, Slavgorodsky / Slavgorod / Yaroev, Barnaul, Suetsky, Bystroistoksky, Mikhailovsky, Ye goryevsky, Novoaltaisk (total 15 districts/cities, which is 14 units higher than in 2007).

The group of municipalities with a relatively low potential for the development of consumer cooperation included municipal districts and/or cities: Biysky / Biysk, Shelabolikhinsky, Zonalny, Tabunsky, Khabarsky, Smolensky, Pavlovsky, German National, Topchikhinsky, Burlinsky, Zavyalovsky, Sovetsky, Pospelikhinsky, Tyumentsevsky (total 14 districts/cities, which is 12 units lower than in 2007). Most of the municipal districts/cities of the Altai Territory for the period 2007-2020 was in different groups according to the level of potential for the development of consumer cooperation, retained their location in the group of districts of only 34 districts/cities (Novoaltaisk, Krutikhinsky, Pervomaisky, Tselinny, Ust-Pristansky, Rebrikhinsky, Volchikhinsky, Novichikhinsky, Zalesovsky, Pavlovsky, Baevsky, Kasikhinsky, Zavyalovsky, Shipunovsky, Sovetsky, Kurinsky, Burlinsky, Talmensky, Krasnooshchepkovsky, Khabarsky, Rubtsovsky / Rubtsovsk, Aleisky / Aleisk, Zonalny, Ust-Kalmansky, Kulundinsky, Troitsky, Tabunsky, German National, Shelabolikhinsky, Soltonsky, Topchikhinsky, Smolensky, Loktevsky, Biysky / Biysk) (table 3).

Table 3. Municipalities of the Altai region with different levels of cooperation potential in dairy farming (fragment).

| Municipalities          | Cooperation potential | Municipalities          | Cooperation potential |
|------------------------|-----------------------|------------------------|-----------------------|
| Novoaltaisk            | 1                     | Mamontovskiy           | 2                     |
| Krutikhinsky           | 2                     | Pervomaisky            | 2                     |
| Uglovsky               | 2                     | Pospelikhinsky         | 3                     |
| Tselinny               | 2                     | Soloneshensky          | 3                     |
| Ust-Pristansky         | 2                     | Rodinsky               | 3                     |
| Rebrikhinsky           | 2                     | Charyshsky             | 4                     |
| Pankrushikhinsky       | 2                     | Bystroistoksky         | 4                     |
| Kalman                 | 2                     | Romanovsky             | 4                     |
| Volchikhinsky          | 2                     | Kytmanovsky            | 4                     |
| Novichikhinsky         | 2                     | Klyuchevsky            | 4                     |
| Zalesovsky             | 2                     | Pavlovsky              | 4                     |
| Baevsky                | 2                     | Altai / Belokurikha    | 4                     |
| Kosikhinsky            | 2                     | Zavyalovsky            | 4                     |
| Kamensky / Kamen-na-Obi| 2                     | Blagoveschensky        | 4                     |
| Rubtsovskiy / Rubtsovsk| 2                    | Barnaul                | 4                     |
| Aleyskiy / Aleysk      | 2                     | Slavgorodsky / Yaroeve | 4                     |
| Togulsky               | 2                     | Zonalny                | 4                     |
| Ust-Kalman               | 2                    | Zarninsky              | 4                     |
| Kulundinsky            | 2                     | Petro pavlovsky        | 4                     |
| Troitsky               | 2                     | Tretyakovsky           | 4                     |
| Kamensky               | 2                     | Tabunsky               | 4                     |
| Yeltskovy              | 2                     | German National        | 4                     |
| Mikhailovsky           | 2                     | Shelabolikhinsky       | 4                     |
| Soltonsky              | 2                     | Topchikhinsky          | 4                     |
| Tyumentsevsky          | 2                     | Smolensky              | 4                     |
| Loktevsky              | 2                     | Biysky / Biysk        | 4                     |

*a* cooperation potential: 1 – highest, 2 – high, 3 – medium, 4 – relatively low.
More than 50 agricultural consumer cooperatives are registered in the region, but only five of them actually operated: Voskhod (Topchikhinsky district), Druzhba (Tselinny district), Kolos (Talmensky district), Smolensky (Smolensky district), CharyshAgroProduct (Charyshsky district), whose assets in 2019-2020 in total amounted to 407.9-410.3 million rubles. (95.77-96.13% of the income of agricultural consumer cooperatives in the region), revenue of 405.9-420.8 million rubles. (98.52-98.97% of the income of agricultural consumer cooperatives in the region). Milk is collected by only three cooperatives: Voskhod (Topchikhinsky district, relatively low potential for the development of dairy cattle breeding in small forms of farming), Kolos (Talmensky district, high potential for the development of dairy cattle breeding in small forms of farming), CharyshAgroProduct (Charyshsky district, high potential for the development of dairy cattle breeding in small businesses). Comparison of the potential for cooperation in the municipal districts of the Altai region and the actual location of agricultural consumer cooperatives suggests that the level of development of consumer cooperation, even in the conditions of inter-district interaction, does not correspond to the potential available in certain districts.

It should be noted that for the Altai region, the cooperation of small forms of dairy farming is the only direction of their development, which makes it possible to stabilize in the short term, and in the long term to increase the volume of milk sales, create an effective mechanism for controlling the quality of products, improve equipment and income of the population living in rural areas. An indirect effect of the development of consumer cooperation will be a decrease in the financial burden on the regional budget while reducing tension in the labor market, reducing migration losses, and increasing the attractiveness of the rural lifestyle.

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