

Algorithm for Determining Target Markets for the Sale of Agricultural Products Produced in the Region

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Abstract—The article considers a methodological approach to determining target markets for the sale of agricultural products produced in the region, based on the proposed author's research algorithm. The research algorithm consists of four stages: determination of input and output parameters of agricultural markets, their assessment, identification of surplus of manufactured products, determination of key indicators of these products. In the course of the study, we identified a surplus (deficiency) of the main types of agricultural products produced in the region. There was an opportunity to identify factors holding back the possibility of expanding export supplies and exporting surplus products to other regions. We have tested this methodological approach in relation to the Irkutsk region and can be used in other regions.

Keywords—*state plan; algorithm; target markets; agricultural products; export.*

I. INTRODUCTION

In the Irkutsk region, for the first time from all regions of Russia, a State plan for socio-economic development of the Irkutsk region for 2019-2023 (hereinafter Gosplan) was developed. For its successful implementation, we made an attempt to develop an algorithm for determining target markets for the sale of agricultural products produced in the Irkutsk region.

II. LITERATURE REVIEW

Models of target markets are considered in the works of Edmond C., Midrigan V., Xu D.Y., Zaitsev Yu.A. [12]. Vectors of export development are reflected in the works of Calabrò G., Vieri S. [3]. The influence of state policy on the development of agricultural exports - Frini A., Benamor S., Mironenko N.V. Bastos P., Silva J., Verhoogen E. [4-6]. Rational distribution of agricultural products in the region - Semyashkin G.M., Pozdeev D.V., Semyashkin E.G., Kalinin N. [7, 8].

III. RESEARCH METHODOLOGY

The target market, in the narrow sense of the word, refers to the main market for the sale of products, in the broad sense of the word - a group of consumers, private or corporate, united by common characteristics [9].

Determining the target market is most often associated with identifying a specific buyer (s) for a particular company in order to maximize profits. In general, for agricultural producers in the region, you can only set the main vectors for the sale of their products, since the agricultural market is a complex multi-parameter object (Fig. 1).

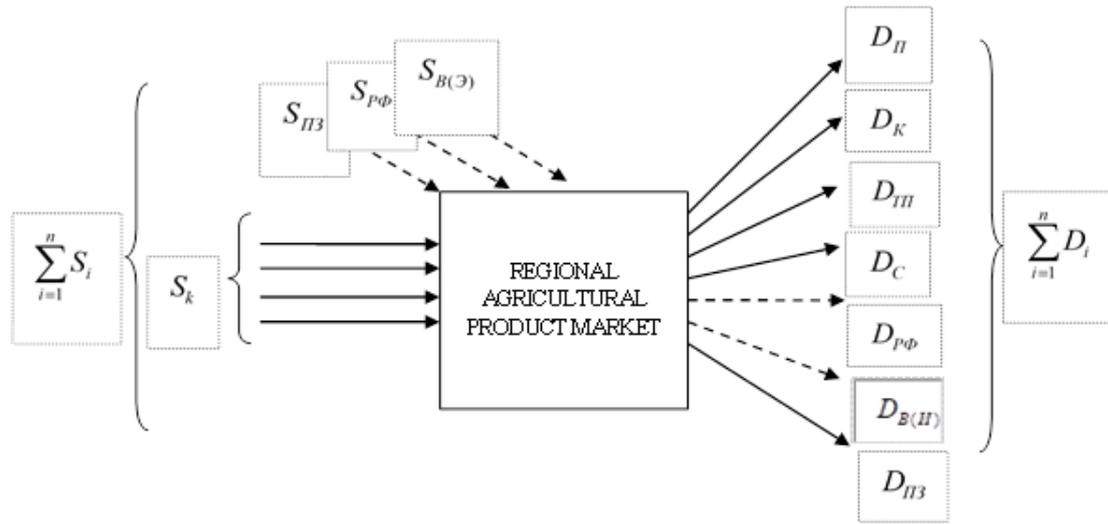


Fig. 1. The regional agricultural market as a multi-parameter object [10]

- S_k – volume of agricultural products produced by local producers in the planning period;
- $S_{ПЗ}$ – carry-over stocks at the beginning of the year, for example, July of the current year for crops;
- $S_{РФ}$ – volume of the reserve stabilization fund of grain in the current period;
- $S_{В(И)}$ – import from other regions and import;
- $D_{П}$ – agricultural consumption for food;
- $D_{К}$ – feed consumption;
- $D_{ТН}$ – consumption for technical needs (production of alcohol, beer and other products);

- D_C – seed fund creation;
- $D_{РФ}$ – creation of a reserve fund;
- $D_{В(И)}$ – export outside the region and import.

Determining the target markets for the sale of agricultural products produced in the Irkutsk region is impossible without assessing the ratio of the total demand and supply of these products. We have developed an algorithm for researching target markets for agricultural products (Fig. 2).

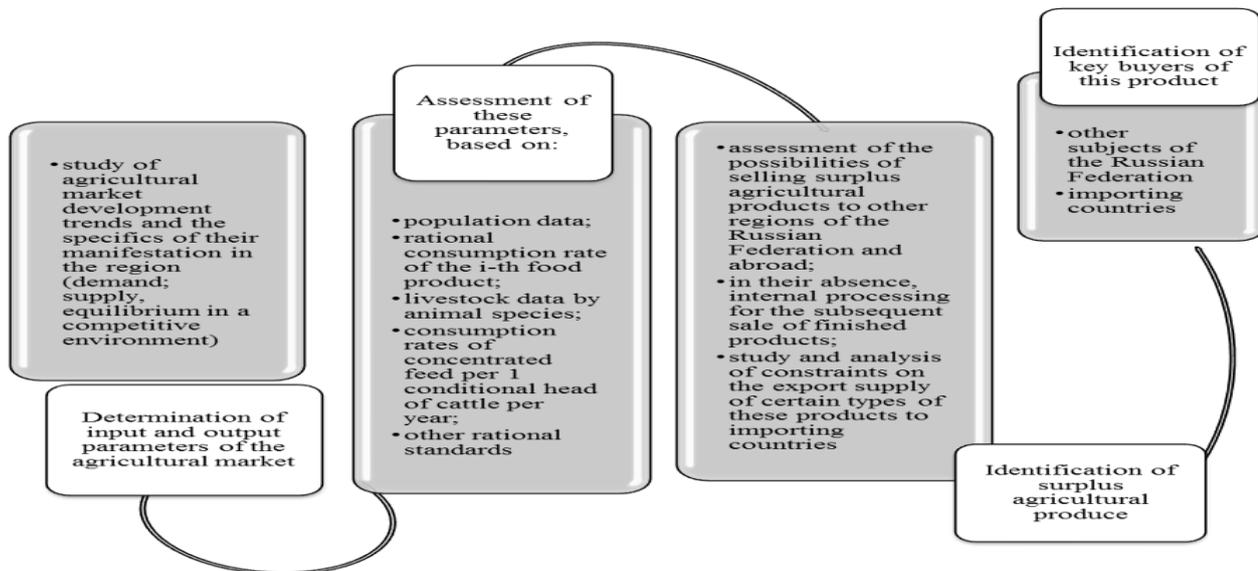


Fig. 2. The algorithm for the study of target markets for agricultural products market

IV. RESULTS

One of the key indicators of the State Planning Commission is the gross output of products in the region (Tab. I).

TABLE I. GROSS INDICATORS OF PRODUCT PRODUCTION IN THE IRKUTSK REGION FOR 2018-2023¹

Indicators	Years						2023 to 2018, %
	2018 (actual)	2019	2020	2021	2022	2023	
Grain production, thousand tons	826.0	904.0	1000.0	1025.7	1047.5	1070.0	129.5
Potato production, thousand tons	393.2	398.3	400.8	400.8	400.8	400.8	101.9
Vegetable production, thousand tons	109.5	110.5	112.8	125.8	137.8	144.7	132.2
Production of livestock and poultry for slaughter (in live weight) in all categories of farms, thousand tons	153.4	162.2	165.4	168.7	172.1	175.5	114.4
Milk production, thousand tons	458.8	465.0	472.2	480.6	489.0	496.2	108.2

¹ – [11, p. 71]

According to the Gosplan, it is planned to increase the production of the main types of agricultural products relative to 2018: grain - by 29.5%, potato - by 1.9%, vegetables - by 32.2%, livestock and poultry for slaughter (in live weight) - by 14, 4%, milk - by 8.2%. At the same time, an increase in production volumes entails the search for target markets for the sale of surpluses of these products.

The State Planning Commission sets the following targets for the region's self-sufficiency in agricultural products and their consumption, taking into account the recommended norms (Tab.II).

The level of self-sufficiency of the Irkutsk region with the main types of agricultural products is planned to increase by 2023 compared to 2018 for potatoes by 8.4%, for vegetables - by 20.2%, for meat - 6.7%, milk - 2%. In this case, full self-sufficiency will not be achieved for any type of product.

TABLE II. SELF-SECURITY LEVEL OF AGRICULTURAL PRODUCTS AND VOLUME OF ITS CONSUMPTION IN THE IRKUTSK REGION FOR 2018-2023¹

Indicators	Years						2023 to 2018, %
	2018 (actual)	2019	2020	2021	2022	2023	
The level of self-sufficiency in potatoes, %	88.6	89.9	91.2	92.8	94.2	96.0	108.4
The level of self-sufficiency in vegetables, %	59.4	60.0	61.1	64.0	68.0	71.4	120.2

Indicators	Years						2023 to 2018, %
	2018 (actual)	2019	2020	2021	2022	2023	
The level of self-sufficiency in meat, %	62.3	64.5	65.4	66.3	66.4	66.5	106.7
The level of self-sufficiency in milk, %	87.0	87.1	87.3	87.9	88.3	88.7	102.0
Potato consumption per capita, kg (recommended rate of 90 kg)	102.0	102.0	102.0	102.0	102.0	102.0	100.0
Consumption of vegetables per capita, kg (recommended rate of 140 kg)	70.7	70.7	70.8	75.3	77.3	77.3	109.3
Meat consumption per capita, kg (recommended norm 73 kg)	67.4	69.0	69.5	70.0	71.5	73.0	108.3
Milk consumption per capita, kg (recommended norm 325 kg)	195.3	198.0	201.0	204.0	207.0	209.0	107.0

¹ – [11, p. 74; 12]

The volume of agricultural products consumption for food needs in the Irkutsk region for 2018-2023 is calculated in table III.

TABLE III. SCOPE OF CONSUMPTION OF AGRICULTURAL PRODUCTS FOR FOOD NEEDS IN THE IRKUTSK REGION FOR 2018-2023¹

Indicators	Years						2023 to 2018, %
	2018 (actual)	2019	2020	2021	2022	2023	
Corn	269.3	268.5	267.6	266.6	265.6	264.6	98.3
Potatoes	245.3	244.6	243.7	242.8	241.9	241.0	98.3
Vegetables	167.0	169.5	169.1	179.8	183.3	182.6	107.5
Meat	162.0	165.5	166.0	166.6	169.6	172.5	106.5
Milk	469.5	474.8	480.2	485.6	490.9	493.8	105.2

¹ – [11, p. 74]

The data obtained indicate that the consumption of grain and potatoes for food needs by 2023 compared to 2018 will slightly decrease (on average by 2%), mainly due to a decrease in the population of the Irkutsk region. The average rate of population decline in the Irkutsk region was determined by us on the basis of official statistics and amounts to 0.996%.

According to the State Planning Committee, the consumption of vegetables, meat and milk per capita in the analyzed period will increase (Tab. II), which will entail an increase in the volume of consumption of these types of products for food needs in the Irkutsk Region by 7.5%, 6.5% and 5, 2% respectively.

According to the algorithm previously proposed by the authors, the volume of consumption of certain types of food for on-farm needs of agricultural producers of the Irkutsk region for 2018-2023 was determined (Tab. IV). When calculating it, the data of expert evaluations were used. The experts were leading experts of the Ministry of Agriculture of the Irkutsk Region.

TABLE IV. SCOPE OF CONSUMPTION OF SEPARATE FOOD TYPES FOR DOMESTIC NEEDS OF AGRICULTURAL PRODUCT PRODUCERS OF IRKUTSK REGION FOR 2018-2023, THOUSAND TONS

Indicators	Years						2023 to 2018, %
	2018 (actual)	2019	2020	2021	2022	2023	
The volume of grain consumption for the creation of seed and reserve funds	167.2	182.9	202.4	207.6	212.0	216.6	129.5
Grain consumption for feed purposes	495.6	542.4	600.0	615.4	628.5	642.0	129.5
Potato consumption for seed fund creation	98.3	99.6	100.2	100.2	100.2	100.2	101.9
The volume of milk consumed for feeding calves	36.7	37.2	37.8	38.4	39.1	39.7	108.2

Grain consumption for the creation of seed and reserve funds and fodder goals in the Irkutsk region should increase by 29.5% over the analyzed period, potato consumption for the creation of a seed fund may increase by 1.9%, milk for calves to be drunk - by 8.2%.

At the third stage of the research algorithm proposed by the authors, the surplus (insecurity) of certain types of agricultural products in the Irkutsk region for 2018-2023 was revealed (Tab. V).

TABLE V. VOLUME OF EXCESSIONS (SECURITY) BY SEPARATE TYPES OF AGRICULTURAL PRODUCTS IN THE IRKUTSK REGION FOR 2018-2023, THOUSAND TONS

Indicators	Years					
	2018 (fact)	2019	2020	2021	2022	2023
Corn	-106.1	-89.9	-69.9	-63.9	-58.6	-53.2
Potatoes	49.7	54.2	56.9	57.8	58.7	59.6
Vegetables	-60.5	-59.0	-56.3	-53.4	-45.5	-37.9
Meat	-8.6	-3.3	-0.6	2.1	2.5	3.0
Milk	226.8	229.8	233.4	238.2	242.9	247.5

V. DISCUSSION

Countries exporting major agricultural products: China, Mongolia, Japan, Kazakhstan, Korea, Vietnam, Thailand. As part of the implementation of the federal project "Export of agricultural products" in the Irkutsk region, the national project "International Cooperation and Export" [13], it is planned to reach \$ 76.8 million in agricultural products from the Irkutsk region by 2023 [11]. The achievement of these results, as our calculations show, in accordance with the research algorithm, is quite realistic.

VI. CONCLUSION

The presented calculations indicate that in the forecast period surpluses of agricultural products can occur only for potatoes and milk. These types of products can be sent to export to other regions and export abroad.

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