

Regional Agriculture, Food Supply Systems and Competitiveness of Agriculture Production Industries in Stavropol Territory

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Abstract

The article is devoted to the issue of ensuring the competitiveness of the agriculture and food system currently present in Stavropol Territory. Provision of the local population with locally manufactured food products in sufficient quantities and of the appropriate quality is one of the main challenges for the regional authorities. Assessment for the most advantageous trends for developing agriculture sector in Stavropol Krai considering its supply security, production costs and market demands for the manufactured products is quite essential. Results of the assesment ensured preparation of the market maps for Stavropol Territory with reference to the main product groups, that allowed to rank them in accordance with the identified indicators. To assess efficiency of the industries, the analysis of the investment strategic positions within the main agriculture product groups was prepared and involved imlementation of adjusted BCG matrix. Based on the obtained data the following was prepared: ranking for agricultural industries considering their socio-economic importance for the Stavropol Territory, and recommendations on the feasible trends for particular industries.

Keywords: food security, agricultural market, food market, product group, matrix BCG

1. Introduction

Among the major strategic objectives in Russian food doctrine it is necessary to highlight formation of the efficient national market for agricultural products which is influenced by the particular features of the regional markets and global trends (Veeman & Veeman, 2004; Urban, 2010).

The main economic factors affecting formation and development of the market for agricultural products are offer and demand, which should be studied in close connection (Tomilina, Glotova, & Kuzmenko, 2013; Garmann, 2014). Nevertheless, in accordance with the market rule of law, it is the demand in particular that determines the offer. Market assesment to identify the demand is necessary to determine the total volume of sales of certain goods for a certain period of time.

The particular markets were suggested as the subject for the assesment and they were identified within the certain main groups of agricultural products as follows: grain; meat and meat products; milk and dairy products; potatoes; vegetables and table melons; fruits and berries; eggs and egg products; fish and fish products (Sklyarov & Sklyarova, 2013; Trukhachev, 2013).

Comparative gradual record of self-sufficiency of the Stavropol Territory, the North Caucasus Region and the Russian Federation showed that the Stavropol Territory is self-sufficient in grain, meat and milk, while the North Caucasus Region is self-sufficient in grain and vegetables, and Russia is self-sufficient in grain.

Deficiency in the locally manufactured products is balanced by the import from other regions and abroad. Comparison of import and export of products helps to determine the trends in the trade. For example, production of fruits and berries is a sector that shows heavy importing. At the same time, Territorial and Regional markets show higher degree of market openness for grain, meat, milk, eggs and fish, whereas the National one is open for grains, milk, eggs. Therefore the level of market concentration is reduced and it entails increased competition preasure from the foreign suppliers (Food security and agrarian problems of the Russian economy, 2011; Jones & Davidson, 2014).

However, undertaken inventory dynamics analysis indicates sufficient food security in all product groups and

types of markets.

2. Method

Food security has been a subject for devoted works with many foreign and domestic scholars such as F. Quesnay, Adam Smith, T. Maltus, D. Rikkardo, K. Marx, N. Kondratiev, A. Chayanov, N. Bukharin, S. Afanasyev, V. Balabanov, N. Radugin, Y. Sklyarova, N. Kharitonov, G. Anania, R. Nisticò, F. G. Baquedano, W. M. Liefert, M. Veeman, T. Veeman, etc. Despite the fact that food security is given a lot of attention in economics science, we must admit that many aspects of this problem are currently not sufficiently advanced. All this requires the study on viability of development for certain product groups (Rudoï, 2011; Evdokimova, 2009).

The works devoted to the prioritizing some food groups over the others and their ranking so far have not been systemized and were implemented as parts of other researches. In this context, the aim of this work is to justify the selection of investment-attractive sectors of agriculture, and seek to improve the food production efficiency. In accordance with the purpose the following main objectives were defined: identify and quantify the indicators characterizing the sufficiency of domestic food products in the local market; examine the level of sufficiency in meeting the population needs in food produce; analyze strategic investment positions for agricultural commodity groups.

Fulfillment of the goals and objectives of this work was supported by the following research methods: analytical, monographic, abstract logics, constructive calculations, economic and mathematical modeling.

3. Results

Generalized data for resource balances and resource utilization in the context of product groups allowed us to calculate the numbers for the following indicators:

- The level of self-sufficiency with the main types of agricultural products-represented as a ratio of production in the territory to its domestic consumption. Domestic consumption includes industrial consumption, private consumption (consumption fund), loss of production, and non-food purpose processing;
- Import dependancy of the basic goods in the food groups-represented as a ratio of all goods imported to the territory (including import from abroad) to the total volume of resources;
- Import consumption of the basic goods in the food groups-represented as a ratio of all goods imported to the territory (including import from abroad) to domestic consumption;
- Trade balance of essential commodities in the food groups-represented as the difference between the export of goods, including export abroad, to import of goods (including import from abroad);
- The level of exports for basic commodities within the food groups-represented as the ratio of export of goods (including export abroad) to production;
- Volume of trade for basic commodities within the food groups-represented as the sum of imports to the territory (including imports from abroad) and exports (including exports from abroad);
- Coefficiency for the agricultural market availability-represented as the ratio of foreign trade turnover of the main commodities in the food groups to their production:

$$K_o = (Q_i + Q_e) / TVAP, \quad (1)$$

where K_o -is the coefficient of availability,

Q_i -quota for imports of agricultural products,

Q_e -quota for exports of agricultural products,

TVAP-total volume of agricultural production .

If $K_o = (Q_i + Q_e) / TVAP > 1$ -then it is the importing industry;

If $K_o = (Q_i + Q_e) / TVAP < 1$ -then it is the exporting industry.

When the degree of market availability is increased the level of market concentration is reduced, and that to a certain extent leads to the increased competition pressure from the external suppliers (Syomin & Kibirov, 2013; Baquedano & Liefert, 2014). It can be estimated by means of charging the share of imported goods (including imports from abroad) in the total saleslevel at the particular commodity market. This indicator also draws the red line where addressing the issues related to preventive measures to protect domestic producers become necessary.

3.1 Statistics and Data Analysis

Comparative gradual record of self-sufficiency of the Stavropol Territory, the North Caucasus Region and the Russian Federation showed that the Stavropol Territory is self-sufficient in grain, meat and milk, while the North Caucasus Region is self-sufficient in grain and vegetables, and Russia is self-sufficient in grain.

Lack of local produce resources is balanced by import from other regions and abroad. Local territorial market is most import depended on fruit (share of imports ranges from 44.7% to 46.9%) and in fish by more than 65%. Also in the Stavropol Territory there has been evident declining of import dependency in potatoes and vegetables (almost by 2), and significant increase of imports in meat (almost by 2), milk-by 35.5%, eggs by 1.8 times.

Regional market is most import depended in fruit, the share of imports may come up to 52%. In the North Caucasus region there has been evidence of declining imports in potatoes by 10% and vegetables by 3%, a significant increase of imports in meat and milk-by 30%, eggs-by 44%.

The national market shows high import dependency in fruits-to 60%, and meat-more than 20%. Import dependency is decreasing in potatoes by 17%, vegetables by 3%, and meat-265, whereas increase of import dependence is in both milk and wheat by 14%, and eggs-by 50%.

During the assessed period the level of import consumption in Stavropol Territory increased in the meat by 2.5 times, in milk-by 1.4 times, in fruit and eggs-by 5.1%; decrease of import consumption was shown in grains by 60%, potatoes-by 45%, vegetables-47%. The level of import consumption in the Region increased in the meat by 1.5 times, in milk-by 1.4 times, in eggs-by 1.4 times, in potatoes-by 1%, in vegetables-by 4%. The level of import consumption in Russia increased by 7% grain, milk-14%, eggs-by 1.5 times, the meat fell by 26%, potatoes-by 17%, vegetables-3%.

With the shown trends in import dependency and import consumption, the level of exports from the Stavropol Territory during the period of 5 years increased in grain by 95%, in meat-by 2.3 times, in milk-by 12.5%, in vegetables-by 6.7 times, in fish-by 4, 5 times and decreased in fruit-by 56%, and in eggs-by 23%. The level of exports from Russia in general increased in grain by 2.5 times, in meat-by 14.3%, in milk-by 5.3%, in vegetables-by 5.8%, and in eggs-by 42.9% ; although it decreased in potatoes-by 2 times.

Comparison of import and export of products determines the vector of trade. Thus, Stavropol Territory market is export oriented in grain, meat and milk; Regional market is export oriented in grains and vegetables, whereas Russian market is export oriented in grains only.

Import depended industry is production of fruits and berries, since market availability factor is > 1 at all assessed markets. At the same time, Territorial and Regional markets show higher degree of market availability in grain, meat, milk, eggs and fish; the national market availability is grains, milk, and eggs. Therefore the level of market concentration is reduced, and that leads to increased competition pressure from the foreign suppliers.

The red line for imports to become a threat is considered to be 10-35% on various commodities. Comparative characteristics of the import share in the sales volume of the Stavropol Territory, the North Caucasus region, and of the Russian Federation lead to the following conclusions: in the Stavropol Territory such situation is typical for fish-more than 70%, fruits-more than 50%, vegetables and meat-more than 20%. In the North Caucasus Region these are fruit market-more than 80%, meat market- more than 50%, milk, vegetables and eggs-more than 20%. In Russia the same is for fruit-more than 70%, meat and milk-more than 20%.

Analysis of the trends in food stock proves sufficient food security within all product groups and markets. However, the Regional market is experiencing decline in stocks for grain by 58%, meat-by 3.2%, eggs-by 13.3%, National market shows decline in stocks for grains-by 36%, and milk-by 3.1%.

3.2 The Study of Saturation Level of the Needs of the Population in Food

The implemented assesment on market capacity must be supplemented with the study on how well the market meets the needs of the population in food, including availability of locally produced goods. This requires to consider the overall demand for agricultural produce as demand for food comodities. The study then shows a steady trend of growth in aggregated demand for agricultural products by 2.1 times against population growth in Stavropol Territory. In general, during the period of the assesment income generation with population increased by 1.7 times. Food expences increased by 1.9 times, and the share of food cash outflow within the overall consumers' disbursements increased. As a result, the ratio of household demand for agricultural products to the volume of agricultural production increased by 1.6 times.

To determine the market sufficiency level we used the scientific standards for consumption. Comparison of existing consumptions of basic food products in the Stavropol Territory, the North Caucasus Region and in the

Russian Federation with the standard values, revealed that there is a persistent increase in the saturation level for regular nutritional needs.

Nutritional demands of the population in Stavropol Territory are met in grain products to more than 140%, meat to 91.8%, milk to 62.4%, potatoes-to 122.4%, vegetables-to 112.3%, fruits-to 42.1%, eggs-to 111.5%, and fish-to 40%. Nutritional demands of the population in North Caucasian Region are met in bread products to 122-127%, meat-to 76,7-104,1%, milk-to 71.8%, potatoes-to 101-111,2%, vegetables-to 111,5-127,7% fruit-to 56,8-83,2%, eggs-to 82,7-116,2%, fish-to 36,5-80%. Nutritional demands of the population in Russia are met in bread products-by 119%, meat-by 101.4%, milk-by 75.5%, potatoes-to 113.3%, vegetables to-83.8%, fruits-to 63.2%, eggs-to 106.2%, and fish to 85.5%. It is obvious that the market shows the evidence of products' substitutions, and it is proved by the ratio between the existent population incomes and the prevailing market prices for food (Anania & Nisticò, 2014).

3.3 Features of Supply and Demand for Agricultural Products

It should be noted that pricing policy in agriculture has certain unique features related to this industry, which were developed amidst specific demands and supplies of agricultural products (Rakhmatulin, 2006; Trukhachev, 2013). The demand is characterized by the following features:

- Demand for agricultural products, unlike most non-agricultural products has more clearly defined edges for saturation. It is closely linked with physiological limits of human consumption. This entails reduction of the share for food expenditures compared to total consumption expenditure in the environment of progressive development of society;
- Elasticity of demand reduces, as it is oriented to the income of the end users in the environment of mainstreaming of absolute population needs;
- Growth of demand is hindranced while the level of proposals accelerates.

Specialty features of agricultural offers are as follows:

- In contrast to the demand, agricultural offers have no clearly defined limits;
- In the environment of better developed social manpower and demand mainstreaming to the utter population requirements, the growth of the offer level in agriculture produce surpasses the level of demand;
- The offer of agricultural production depends on biological and climatic conditions;
- The industrious resources show immobility (land in agriculture is not actually a part of the inter-sectoral reallocation resources, inter-sectoral reallocation of other resources is difficult because of the presence of specific barriers to entry and exit in the industry) (Trukhachev, Kostyukova, Gromov, & Gerasimov, 2014; Sobchenko, 2010).

Retail prices for selected food items structured to identify a specific part that raw materials (agricultural products) compile accounted for an average of 23 to 59%.

Given the high import dependancy on a number of products there have been a comparison made to the prices of these imports and world prices. The data indicate a significant deviation of consumers' prices in the local market to those of the regional, national and the world markets. The world prices indexes are higher than Russian ones.

3.4 The Results of the Ranking of Product Groups Agricultural Products

The implemented study resulted in preparation of the market maps for Stavropol Territory that lay within the major agriculture product groups; the maps would allow to estimate the special aspects of the Territory agricultural market, identify factors influencing its development and detect the most favorable trends considering the market demands for the local produce.

Using the market maps the commodity groups are ranked by means of the selected indicators (Table 1), the analysis shows that within the contextual aggregated volume of the market the share of grain sales prevales whereas fish and fish products are the outsiders.

However, a combination of extra indicators made "Vegetables and table melons" a top priority group, overcoming "Grain", putting the groups "Meat", "Fruits and Berries", and "Fish and fish products" in third place, "Eggs and egg products "-in the fourth position "Milk and dairy products" is the fifth, with " Potatoes" concluding the rating group.

In order to make the final decision about the feasibility of a particular industry an analysis was made for strategic investment positions of agricultural commodity groups with the supplement of constructing an adapted BCG matrix (Figure 1).

Table 1. Ranking of the agriculture commodity groups in Stavropol Territory using the system of the market indicators

	Grains	Meat and meat produce	Milk and dairy products	Potatoes	Vegetables and table melons	Fruit and berries	Eggs and egg produce	Fish and seafood
Share in the total volume of the market capacity,%	42,2	3,9	12,5	9,1	10,2	3	18,6	0,5
Indicator Rank	1	6	3	5	4	7	2	8
Level of self-reliance,%	366,0	106,8	107,1	72,3	73,9	48,2	95,4	26,4
Indicator Rank	1	3	2	6	5	7	4	8
Import dependency,%	1,3	18,7	4,5	23,9	31,3	45,9	14,1	64,5
Indicator Rank	8	5	7	4	3	2	6	1
Import consumption,%	6,9	28,3	5,2	29,1	37,4	53,9	15,7	76,2
Indicator Rank	7	5	8	4	3	2	6	1
Export level,%	77,1	32,5	11,5	0,6	12,5	4,0	11,7	7,2
Indicator Rank	1	2	5	8	3	7	4	6
Agriculture market availability ratio	0,8	0,6	0,2	0,4	0,7	1,2	0,3	0,8
Indicator Rank	2	4	7	5	3	1	6	2
Sales of imported goods,%	1,7	28,3	5,2	28,9	36,9	53,9	15,7	75,6
Indicator Rank	8	5	7	4	3	2	6	1
Meeting the consumers' needs level,%	143	84,9	60,7	118,6	100,8	39,1	106,9	36,8
Indicator Rank	1	5	6	2	4	7	3	8
Ranks Total	29	35	39	40	28	35	37	35
Group Ranking	2	3	5	6	1	3	4	3

Positions held by the particular businesses within the strategic trends defined by the BCG matrix recommend the selection of precise actions. The "Stars" must try to maintain or increase their share in the market. The "Cash Cows" need maintain or increase the proportion of business in the market. The "Dogs" should be satisfied with their status quo, otherwise reduce or eliminate this type of business.

The assessment results for strategic investment positions and market demand showed that the priority sub-sectors are: fruit growing, vegetable production both open air and greenhouse, poultry meat production, sheep and cattle growing.

The evaluation of already implemented investment projects encouraged rating of agricultural industries based on the socio-economic importance for the Stavropol Territory. Rating was based on the following indicators: the coefficient of the of investment projects' social importance; coefficient of the industries' investment activity; domestic net profit ratio of implemented investment projects; and payback period of the investment project.

Composed ratings allowed determine most feasible trends for investments into agriculture and industrial complex of the Stavropol Territory:

- 1) Agriculture processing capacities (construction of an oil extraction plants and feed mills), will contribute to complete process cycle (Sklyarova, Sklyarov, Gurnovich, Latysheva, Lapina, Kuleshova, Ostapenko, & Voronin, 2013; Yarkova & Svetlakov, 2013).
- 2) Poultry growing (turkeys).
- 3) Vegetables (greenhouses).
- 4) Logistics infrastructure (construction of vegetable and fruit storage capacities) .
- 5) Vegetables (open air).

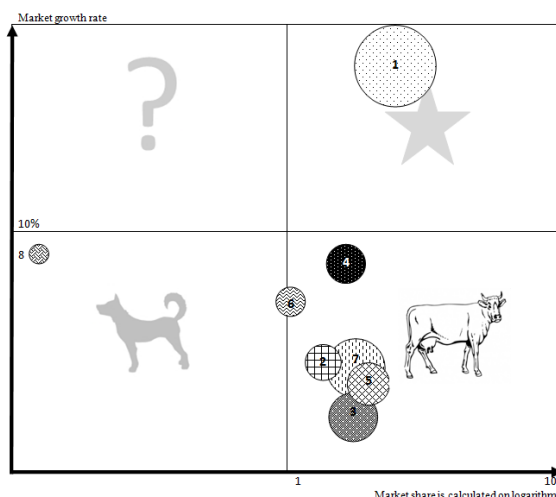


Figure 1. BCG matrix for strategic investment agricultural commodity groups in Stavropol Territory

Legend:

1. Grains 2. Meat and meat produce 3. Milk and dairy products
 4. Potatoes 5. Vegetables and table melons 6. Fruits and berries
 7. Eggs and egg products 8. Fish and seafood

Table 2. Merged ranking of the agriculture industries in Stavropol Territory considering the level of their importance

Types of Produce	Ranking the produce production and resource security	Ranking the produce investment attractiveness	Ranking Market availability for the produce	Ranking the produce social value	Merged Ranking	Prioritizing
Vegetables (greenhouses)	4	3	1	5	13	2
Fruit	7	2	3	6	18	4
Poultry Meat	2	2	3	4	11	1
Milk	5	8	5	1	19	6
Meat (beef)	11	7	3	2	23	7
Meat (lamb)	7	7	3	7	24	8
Sunflowers	1	1	2	6	10	2
Soy beans	2	1	2	8	13	5
Vegetables (open air)	5	5	1	3	14	3

Overlapping the ratings in the frames of their production and resource security, investment attractiveness, market availability, and their social significance (based on the experts' evaluations) showed that the most promising sector in the Territory is poultry meat production (especially that of turkey) (Table 2).

4. Conclusion

This study allows to identify the most advantageous trends for developing agriculture sector in Stavropol Krai considering its supply security, production costs and market demands for the manufactured products. Priority industries include poultry meat production, vegetable growing, fruit growing.

Furthermore, based on the survey of the existing agriculture businesses in Stavropol Territory the following industries were defined as those that will serve diversification of the agribusiness and become an additional source of income for the population: floriculture, mushroom production, berries production (Sklyarova, Sklyarov, Gurnovich, Latysheva, Lapina, Kuleshova, Ostapenko, & Voronin, 2013).

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