Problems and prospects of cheese production in Russia

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Abstract. The Russian cheese market is in constant dynamics. A range of products is available on the market, a wide price range makes cheese a product affordable for all segments of the population; and a steady growth in this industry can be predicted. In this regard, an analysis of the prospects for the production and sale of cheese on the Russian market is of scientific and practical interest. Analysis of statistical data of the Federal State Statistics Service, the Territorial Body of the Federal State Statistics Service for the Altai Region, as well as analytical materials of the Altai Region Administration for the development of entrepreneurship and market infrastructure are presented and critically analyzed. Trends in the production and sale of cheese products are formulated. Factors hindering their development identified; development vectors in terms of import substitution are defined. The following general scientific research methods were used: analysis and synthesis, comparison, statistical methods, modeling, expert assessment method, description, etc. The scientific novelty of the study consists in assessing the factors determining the development of cheese production in the Russian Federation, as a whole, and in the Altai Region, in particular, and in developing the institutional, industry, and local vectors for its development.

1. Introduction

In nutrition, cheese is recognized as a highly nutritious, a biologically complete and easily digestible product, because it contains the necessary human proteins, fats, carbohydrates, and their derivatives, mineral salts, trace elements and vitamins [1, 2]. According to the Agency International Dairy Federation, France (25.9 kg/year), Iceland (25.2 kg/year), Finland (24.7 kg/year) are among the three leaders in per capita cheese consumption.

In Russia, cheese is traditionally not so popular, this is due to national traditions, low cheese involvement as an ingredient in dishes of national cuisine. However, the active expansion of foreign, mainly European national cuisines into the restaurant industry, the expansion of the product range in the food retail industry, the growth of outbound tourism has formed a steady trend towards increasing demand for this product, made it popular and even “fashionable”. In the first years after food embargo, the range of cheese on the Russian market was significantly reduced. However, there is an increase in the production of cheese products by domestic producers over the past two years. Today, we can state with confidence that the fashion for cheese is unlikely to pass; it is firmly established in the diet of the modern Russian consumer. The Russian cheese market is in constant dynamics, the range of products on the market, the wide price range makes cheese a product accessible to all segments of the population; and we can predict the steady growth of the whole industry. In this regard, an analysis of the prospects for the production and sale of cheese on the Russian market is of scientific and practical interest.
2. Materials and Methods

An analytical review of scientific literature on the research topic and analysis of statistical data of the Federal State Statistics Service, the Territorial Body of the Federal State Statistics Service for the Altai Region, as well as of analytical materials of the Altai Region Administration for the development of entrepreneurship and market infrastructure, was conducted. The boundary conditions of the study aimed at identifying trends in the production and sale of cheese products and factors hindering their development are analyzed; development vectors in terms of import substitution are defined. To solve the set tasks, the following general scientific research methods were used: analysis and synthesis, comparison, statistical methods, modeling, expert assessment method, description, etc.

The scientific novelty of the study consists in assessing the factors determining the development of cheese production in the Russian Federation and in the Altai Region, in particular, and in developing the institutional, industry and local vectors for its development.

3. Results

In 2016, the Ministry of Health of the Russian Federation, taking into account changes in the production and consumption of food products, developed new recommended food consumption standards to meet modern requirements for healthy nutrition [3]. The recommended annual consumption of cheese is 7 kg per person, which is 1 kg more than it was previously recommended by the Ministry of Health of the Russian Federation [4]. The real average per capita consumption of cheese in Russia is significantly lower, both new and old, and amounts to 5.4 kg in 2014 (90.0% of the norm recommended in 2014) and 5.7 kg, according to the International Dairy Federation (IDF) in 2016 (81.4% of the norm recommended in 2016) (Table 1). The reasons for this situation are the unformed culture of cheese consumption due to the acute shortage of this product during the Soviet era, the lack of national dishes with cheese.

Table 1. Dynamics of consumption of cheese in Russia (according to [5, 6]).

| Indicator                           | 2000 | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|-------------------------------------|------|------|------|------|------|------|------|------|
| Cheese sales, thousand tons         | 339  | 689  | 808  | 820  | 858  | 850  | 789  | 762  |
| Population, thousand people         | 146597 | 143519 | 142849 | 142961 | 143202 | 143507 | 146091 | 146406 |
| Per capita cheese consumption, kg / person / year | 2.31 | 4.80 | 5.66 | 5.74 | 5.99 | 5.92 | 5.40 | 5.20 |

Before the introduction of restrictions on the import of food from a number of foreign countries [7], that is, until the autumn of 2014, imported products accounted for about 50% of the cheese consumed in Russia. According to TrendEconomy.ru [12], from 2002 to 2014, Russia occupied the leading position as an importing country on the world cheese and cottage cheese market (Table 2).

Table 2. Indicators characterizing Russian cheese imports.

| Year | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Place in the world ranking of importing countries [12] | 11   | 10   | 10   | 9    | 10   | 8    | 8    | 8    | 5    | 5    | 4    | 4    | 5    | 10   |
| The share of cheese imports in their commodity resources [13], % | …   | …   | …   | 46.5 | 40.9 | 42.6 | 41.3 | 41.2 | 47.4 | 46.1 | 47.8 | 48.0 | 37.3 | 23.3 |

Cheese was delivered to the Russian Federation from more than 30 countries of the world. Over the years, Belarus, Germany, Ukraine, Lithuania, Finland, the Netherlands, and other countries were the main importers of cheese and cottage cheese. About 70% of all imports accounted for the products of countries that fell under the food embargo in August 2014. In this regard, the volume of imports decreased significantly, and the structure of imports in the context of the counterparty countries changed. According to
the Federal Customs Service, more than 192 thousand tons (192130319 kg) or 86.24% of the cheese was imported to Russia from Belarus. Swiss cheeses are an alternative to French, Italian, and German cheeses. Cheese is also supplied from South America (Argentina, Brazil, Uruguay, Chile), the Caucasus (Armenia, Azerbaijan, Georgia), and Asia (Kyrgyzstan, Kazakhstan), Africa (Tunisia, Morocco, Egypt), and other. The share of each of the listed importing countries in the total volume of cheese imports does not exceed 4%.

Foreign manufacturers, in order not to lose their positions in the Russian market, transfer or expand their production in the Russian territory (for example, the brands “Svjalea” from Lithuania, “Valio” from Finland) or in states that are not affected by the food embargo (for example, the brand “Rokiskio” from Lithuania, because it is produced in Belarus).

The introduction of countersanctions favorably affected the development of the production of cheese and cheese products in Russia. Domestic producers began to increase production volumes. In comparison to 2010, the production of cheese and cheese products in the Russian Federation increased by 38.38% in 2016. However, this growth does not meet the requirements [8].

Traditionally, the Altai Region is a leader in the production of cheese in the Siberian Federal District (about 70% of the production of cheese and cheese products in the Siberian Federal District) and the Russian Federation (about 15% of the production of cheese and cheese products in the Russian Federation). The development trends of cheese production in the Altai Region are similar to the all-Russian.

8 cheese-producing enterprises with the status of a legal entity registered in the Altai Region.

The production capacity for cheese production in Russia is increasing annually, including due to the growth of small enterprises in this area. Mini-cheese factories are opening, the production of cheese in farms is organized.

In connection with the introduction of countersanctions, at the end of 2016 and the beginning of 2017, despite the positive trends in the development of cheese production, the trend of reducing the growth rate of the industry was outlined in Russia. Since the production of cheese is “milk-rich” (10 kg of milk is necessary for the production of 1 kg of cheese), the determining factor is the shortage of raw materials provoked by the decline of agricultural production in the post-Soviet period. So, the volume of milk production in farms of all categories in Russia decreased from 31,847.3 thousand tons to 30,757.9 thousand tons for 2010-2016 [14], which amounted to -3.42%. There is a trend of decline in the production of raw milk (-6.23% and -1.58%, respectively) as well in the Siberian Federal District and in the Altai region. Therefore, experts note, milk processing production facilities in Russia are approximately loaded by 60% [15].

Compliance with the following microbiological indicators of milk is extremely important in the production of cheese: a level of bacterial contamination (in the reductase test is not lower than the first class), KMAFanM (not more than 5.0 • 105 CFU / cm3), a number of spores of mesophilic anaerobic lactate digesting oil-acid microorganisms (for cheeses with a low second heating temperature, no more than 13,000, with a high second heating temperature, no more than 2,500 spores per 1 dm3) [16]. However, these requirements are not being complied with in the current state of animal husbandry to the full, which reduces production efficiency and negatively affects the consumer characteristics of the finished product.

4. Discussion
A significant factor hindering the development of the cheese industry in Russia is the rise in average prices for raw milk sold by agricultural producers of all categories. Over an average of 7 years, prices for cow’s milk rose by 83.34%. In the Siberian Federal District, an increase is about 63.14%, and it is around 83.84% in the Altai region. This directly affects the increase in the cost of production from milk, as well as the selling and retail prices for finished products, including cheese (the correlation coefficient between the prices of raw milk and prices for rennet cheese is 0.98 in the period 2011-2015). This makes it uncompetitive in price compared to imported cheese. Given the decline in real disposable income in Russia, consumer preferences of the population are focused on cheaper dairy products, which cheese a priori cannot be.

The production capacity of the Russian enterprise-producers of cheese is significantly worn out, and technical re-equipment is not available to everyone, since significant financial investments with a long payback period require for this. Industry experts note that at present, for the production of products, expensive equipment of foreign production is mainly used due to the lack of analogues of domestic. It is purchased for a currency at an unattractive rate that has been formed lately. This problem is aggravated by
the fact that when using imported technological equipment for primary production, the use of imported packaging equipment for packaging the finished product of a certain configuration and parameters is necessary.

Partially, the ingredients (bacterial starter cultures, concentrates, and milk-clotting enzyme preparations) used in cheese production are of imported origin, which also leads to an increase in the production costs.

Due to the shortage of raw materials and the desire to reduce the cost of production, producers use poor quality milk with the addition of stabilizers or vegetable substitutes. Experts attribute the growth in the physical production of cheese and cheese products in Russia to the increased growth rates of palm oil imports. At the same time, unscrupulous commodity producers do not indicate the use of fats with a non-dairy origin in the labeling of products, which is a violation and is recognized as counterfeit with appropriate checks.

In a hurry to occupy the vacated niche formed as a result of the introduction of the food embargo, some manufacturers use the technology of accelerated ripening of cheese. This leads to the fact that the resulting product does not meet consumer expectations.

5. Conclusion
Factors hindering the development of cheese production in Russia can be divided into the following: “design and development of recipes,” “raw materials,” “production technology,” “packaging and labeling,” “storage,” “implementation,” “transportation,” and “staff” (Table 3).

Table 3. Factors constraining the development of cheese production in Russia.

| Factors                        | Influence                                                                                       |
|--------------------------------|------------------------------------------------------------------------------------------------|
| Design and formulation development | Long innovation cycle in the development, production and marketing of new varieties of cheese; “Gap” of the innovation cycle, low commercialization of developments [9]. |
| Raw materials                  | Lack of basic raw materials, both quantitative and from qualitative points of view; Seasonality; High level and increase in prices for basic raw materials; Dependence on imported ingredients (bacterial starters, concentrates and milk-clotting enzyme preparations). |
| Production technology          | Limited own technologies and recipes; High depreciation of fixed assets; Dependence on foreign manufacturers of technological equipment; Limited investment in the production of cheese, their high cost and a long payback period. |
| Packaging and labeling         | Dependence on foreign manufacturers of packaging equipment; Low competitiveness of domestic packaging materials; Failure to comply with the requirements of technical regulations [10] on labeling by unscrupulous manufacturers. |
| Storage                        | High capital intensity and energy intensity due to the long production cycle.                   |
| Implementation                 | High share of imports; Dumping by foreign suppliers; A high level and rising prices of cheese; Low competitiveness in price and quality of domestic products; Expansion of large retail and difficult cooperation conditions for small manufacturing enterprises; Elasticity of demand for cheese; Decrease in the purchasing power of the population; Underdevelopment of cheese consumption culture. |
| Transportation                 | High transport rates.                                                                          |
| Staff                          | The lack of highly qualified specialists in the production of cheese.                           |

Despite these difficulties, many experts believe that the domestic cheese market will continue to grow. Further development of the cheese market in the medium and long term will depend on institutional, industrial, and local trends. The increase in production will be ensured by the development of domestic production, namely: strengthening the position of existing enterprises-manufacturers and the emergence of
new enterprises. Thus, there is a scientific and production potential for the development of domestic cheese production. This potential needs to be raised and correctly used in the current economic conditions.

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