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ECONOMIC ANALYSIS OF CANTEEN CARROTS

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Abstract

The paper considers the provision of vegetables to the population, sown areas in the Russian Federation occupied under carrots, the volume and production of canteen carrots. However, the product range is quite narrow, 2/3 of gross production is provided by 5-6 crops of more than 100 cultivated varieties. Sanctions gave us the opportunity to replace the imported product with a domestic one, and we should take advantage of this. The production of new varieties and hybrids in vegetable production is of great national economic importance as it allows not only increasing the yield and its quality, but also significantly reducing the cost of vegetables due to the large output of marketable products and reduction of the cost for combating diseases. In Russia, both the state research institute is most productively engaged in the selection and seed production of canteen carrots – Federal Scientific Center for Vegetable Production and private companies – Poisk Agrohholding, LLC Plant Selection Station named after N.N. Timofeev, etc. The Federal Scientific Center for Vegetable Production has a whole range of carrot hybrids that meet the modern requirements of commercial production: F₁ Altair, F₁ Tavrida, F₁ Krasnogorie, Korsar. The average Russian yield of canteen carrots in 2017 was 41.1 tons/ha. The maximum yield was obtained in the North Caucasus district – 64.5 tons/ha. Thus, it is possible to increase the capacity of the commodity market by creating new domestic varieties and hybrids of canteen carrots with a relatively high yield and high marketable surplus thereby restoring domestic production.

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Keywords: Canteen carrots, economic analysis, import, sanctions



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1. Introduction

The present goals of agricultural development are to ensure food independence of Russia, import substitution of food products, effective development of rural areas, to increase the competitiveness of fish and agricultural products, as well as to strengthen all industries for the effective implementation of the State Program for the Development of Agriculture (Derevyannykh et al., 2020).

Earlier than the other sectors of the economy the agro-industrial complex approved a special plan to promote import substitution. For this purpose, the State Program for the period until 2020 was adjusted. Additional funds were allocated from the federal budget for the resource provision of the State Program. New forms and mechanisms of budget support for the industry were introduced in order to stimulate the growth of agricultural production, increase the rate of import substitution (Vashanov & Maslova, 2016).

In current foreign economic conditions food self-sufficiency remains a priority task (Soldatenko, Razin et al., 2019). The volume of vegetable production in the last 6-7 years has stabilized and amounts to slightly more than 16 million tons and, together with import, mostly covers the needs of the population. However, the product range is quite narrow, 2/3 of gross production is provided by 5-6 crops of more than 100 cultivated varieties (Pivovarov et al., 2018). Sanctions gave us the opportunity to replace a high-quality imported product with a domestic one, and we should take advantage of this (Khovrin et al., 2019; Soldatenko, Sokolova et al., 2021).

2. Problem Statement

To consider measures aimed at providing the population with vegetables and the occupied area in connection with the sanctions, as well as to show the results of the introduction of new varieties and hybrids of canteen carrots selected by the Federal Scientific Center for Vegetable Production.

3. Research Questions

The research questions included the study of the production volume and vegetable area in the country and the world; analysis of the increase or decrease in prices for vegetable products; identification of the world leaders in vegetable production, in particular canteen carrots.

4. Purpose of the Study

The purpose of the study is to analyze the growth or stability of prices, to identify the need of the population for vegetables, as well as to determine the world leaders in the production of canteen carrots.

5. Research Methods

The following methods were used in the analysis of the economic indicator: economic and statistical, mathematical modeling and planning, and methods of systemic and comparative analysis (Berens, 1995; Razin, 2004).

The study is based on the collection and analysis of information from the statistics of RosGosstat, the UN Food and Agriculture Organization.

6. Findings

The provision of the population with outdoor vegetables (in 2019 its number in the Russian Federation was 146.8 million people) makes 68.6% (Table 1). The production of canteen carrots in 2019 amounted to 1559 thousand tons. The consumption rate of canteen carrots per man year is 8 kg.

Table 1. Provision of the Russian population with vegetables in 2019 (farms of all categories), thousand tons (according to Rosstat)*

Crops	Vegetable consumption rates, kg per man year, recommended by the Research Institute of Nutrition of the Russian Academy of Medical Sciences	Need for vegetables, thousand tons	Production in 2019, thousand tons	Security, %
Outdoor vegetables, total	120	17 616	12,092	68,6
		including:		
bulb onions	7	1 028	1670	162,4
canteen carrots	8	1 174	1559	132,8
squash	4	587	543	92,5
canteen beetroot	7	1 028	873	84,9
cucumbers	10	1 468	657	44,7
cabbage	40	5 872	2646	45, 1
tomatoes	28	4 110,4	2077	50,5

*Note: – electronic resource: https://gks.ru/enter prise_economy
 Date of update: 27.03.2020.

In the Russian Federation carrots cover an area of about 70,000 hectares, of which 30,000 hectares in commercial farms. In the Central Federal District – 25.84 thousand hectares or 28% (Leunov, 2017).

In the Ural and North-Western Federal District this culture occupies 16% and 15%, respectively, and in the Southern Federal District – only 6% of the area occupied by vegetables. It occupies a leading position in Moscow region (4.59 thousand hectares), Krasnodar Territory (4.18 thousand hectares), Republic of Bashkortostan (3.53 thousand hectares), Rostov and Bryansk regions (2.98 and 2.95 thousand hectares, respectively) (Litvinov, 2008).

In 2014, an embargo on the import of a number of agricultural products and food gave a new impetus to the development of import substitution in the agro-industrial complex (Decree of the Government of the Russian Federation No. 778 dated August 7, 2014 “On Measures for the Implementation of Decrees of the President of the Russian Federation No. 560 dated August 6, 2014, No. 320 dated June 24, 2015, No. 305 dated June 29, 2016 and No. 293 dated June 30, 2017 [Electronic Resource] / Garant Legal Portal. URL: <http://base.garant.ru>).

The sanctions of the United States and the EU, as well as the embargo imposed by the President of the Russian Federation V.V. Putin in response to them on the supply of imported food, put forward the need for import substitution, restoration of domestic production (Pashinsky & Kovalchuk, 2015).

In current foreign economic conditions food self-sufficiency remains a priority task (Soldatenko, Razin et al., 2019). The volume of vegetable production in the last 6-7 years has stabilized and amounts to slightly more than 16 million tons and, together with imports, it mostly covers the needs of the population. However, the product range is quite narrow, 2/3 of gross production is provided by 5-6 crops of more than 100 cultivated varieties (Pivovarov et al., 2018). Sanctions gave us the opportunity to replace a high-quality imported product with a domestic one, and we should take advantage of this (Khovrin et al., 2019; Razin et al., 2021).

One of the fundamental factors determining the competitiveness of products is the level of its production cost (Borkhunov et al., 2013). The price of producers is formed depending on the level of prime cost, which is the next important characteristic of the agri-food competitiveness (Ushachev, 2015). The maximum decrease was noted for potatoes – by 41%, tomatoes and barley – by 34%, carrots – by 32%, wheat – by 29%. Besides, a significant decrease in the level of prime cost was noted for bulb onions – by 28%, cabbage – by 20%, sunflower oil – by 15% (Maslova et al., 2017; Soldatenko et al., 2021).

The introduction of anti-sanctions and setting the goal of import substitution, as well as a change in the exchange rate policy mechanism of the Central Bank of the Russian Federation at the end of 2014, resulted into a sharp increase in prices. In February 2015, the prices for fruits and vegetables were 43.5% higher than the previous year, and for carrots – by 38.0-40.7% with inflation of 16.7%. The maximum increase in carrot prices compared to the same month of the previous year was in July and amounted to 69.1-77.9%, while in general, the prices for fruits and vegetables increased by 27.9% compared to July of the previous year, while the inflation was 15.6% (Khovrin et al., 2021).

In 2018, the growth rate of prices for fruits and vegetables decreased. Thus, the maximum indicator was 6.4% (in March), and the maximum price decrease relative to the month of the previous year was in June – by 9.8%. The price of carrots did not decrease in 2018, including due to the fact that it was adjusted in 2016 – the weakly price decline in 2015 ranged from 12.5 to 35.1% (Soldatenko et al., 2021).

Despite a significant decrease in imports, the consumption of root crops by an average of 1 person in 2016-2017 increased by 8% compared to 2015-2016, although it has not yet reached the rational norms for the consumption of food products that meet modern requirements for healthy nutrition, which amounts to 17 kg/year/person recommended by the Ministry of Health of the Russian Federation [[https://static2.rosminzdrav.ru/system/attachments/attaches/000/032/267/original/Приказ Минздрава России от 19.08.2016 № 614.pdf](https://static2.rosminzdrav.ru/system/attachments/attaches/000/032/267/original/Приказ_Минздрава_России_от_19.08.2016_№_614.pdf)].

Let us consider the world's canteen carrots production. In 2017 canteen carrots were grown in 149 countries. The sown area of carrots in the countries of the world in 2017 reached 1.15 million hectares, and the gross harvest – 42.8 million tons. The increase over 2013-2017 amounted to 6.0 thousand hectares in sown area, and 4.8 million tons in gross harvest.

The largest sown area for carrots in 2017 was in China – 403.2 thousand hectares. In Ukraine it was 42.7 thousand hectares, India – 37.5 thousand hectares, Indonesia – 37.2 thousand hectares, the USA

– 31.8 thousand hectares, Pakistan – 29.7 thousand hectares, Nigeria – 27.0 thousand hectares, Poland – 22.1 thousand hectares, Italy – 17.5 thousand hectares, Algeria – 17.0 thousand hectares.

The world leader in the production of canteen carrots is China, where in 2017 the country harvested 19.57 million tons. Uzbekistan and the United States, where in 2017 the harvest amounted to 2.25 and 1.54 million tons, respectively, crossed the line of 1 million tons. Twelve countries in 2017 harvested canteen carrots in the amount of 0.5-1.0 million tons: Great Britain (957.0), Ukraine (837.0), Poland (827.1), Germany (733.9), Turkey (571.3), Japan (570.9), France (569.2), Indonesia (559.8), India (554.0), Italy (553.6), the Netherlands (541.6), Pakistan (517.9).

Fifteen countries harvested canteen carrots in the range of 200-500 tons: Morocco (436.1), Algeria (406.4), Belgium (380.0), Canada (361.0), Iran (334.3), Mexico (334.9), Argentina (288.1), Austria (283.8), Israel (255.5), Egypt (240.0), Colombia (229.8), Nigeria (220.8), South Africa (218.3), Tunisia (208.7), Venezuela (200.0).

The average global yield of canteen carrots for 2013-2017 increased by 4 tons/ha (from 33.3 to 37.3 tons/ha) (Shatilov et al., 2020). Over the past 10 years, the gross harvest of canteen carrots has ranged from 1,154.25 thousand tons in 2010 up to 1508.93 thousand tons in 2018. In recent years, the carrot production has remained at the level of 1404.0-1450.8 thousand tons. The production of new breeding varieties and hybrids, which are resistant to the most common diseases and their widespread use in vegetable production, is of great national economic importance as it allows not only increasing the yield and its quality, but also significantly reducing the cost of vegetables due to the large output of marketable products and reduction of the cost for combating diseases (Popov & Mulskaya, 1995).

Today, in addition to state research institutes, many seed-growing agricultural enterprises and private individuals are considered the official selection breeders.

In Russia, in Russia, both the state research institute is most productively engaged in the selection and seed production of canteen carrots – Federal Scientific Center for Vegetable Production ФГБНУ ФНЦО and private companies – Poisk Agroholding, LLC Plant Selection Station named after N.N. Timofeev, etc.

So, the Federal Scientific Center for Vegetable Production has a whole range of carrot hybrids that meet the modern requirements of commercial production: F₁ Altair, F₁ Tavrida, F₁ Krasnogorie, Korsar. The average Russian yield of canteen carrots in 2017 was 41.1 tons/ha. The maximum yield was obtained in the North Caucasus district – 64.5 tons/ha (Khovrin et al., 2019; Khovrin et al., 2021).

The gross production of carrots over 27 years has increased by more than 3 times (Soldatenko, Razin et al., 2019). Thus, it is possible to increase the capacity of the commodity market by creating new domestic varieties and hybrids of canteen carrots with a relatively high yield and high marketable surplus thereby restoring domestic production.

7. Conclusion

The analysis determined that the consumption rate of canteen carrots per man year is 8 kg. Carrots in the Russian Federation cover an area of about 70,000 hectares, of which 30,000 hectares in commercial farms. In the Central Federal District – 25.84 thousand hectares. It was also revealed that the introduction of anti-sanctions resulted into a sharp increase in prices for fruit and vegetable products by 43.5%, and for

carrots – by 38.0-40.7%. The largest sown areas for canteen carrots in the world were determined, these are: China – 403.2 thousand hectares, India – 37.5 thousand hectares, Indonesia – 37.2 thousand hectares, Pakistan – 29.7 thousand hectares, Poland – 22.1 thousand hectares. The world leaders in the production of canteen carrots were identified: China – 19.57 million tons, Uzbekistan and the United States – 2.25 and 1.54 million tons, respectively. Besides, carrots are harvested in such countries as Great Britain (957.0), Poland (827.1), Turkey (571.3), Japan (570.9), the Netherlands (541.6), Pakistan (517.9).

The study identified the competitive varieties and hybrids selected by the Federal Scientific Center for Vegetable Production that meet modern production requirements: F₁ Tavrída, F₁ Krasnogorsk, Korsar. The average Russian yield of these canteen carrot hybrids was 41.1 tons/ha. The maximum yield was obtained in the North Caucasus district – 64.5 tons/ha. Thus, it is possible to domestic production by creating new domestic varieties and hybrids of canteen carrot with a relatively high yield and high marketable surplus.

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