

SCTMG 2020**International Scientific Conference «Social and Cultural Transformations in the
Context of Modern Globalism»****SUPPLY IN PORK PRODUCTS MARKET IN THE CONTEXT OF
REPRODUCTION PROCESS**

Vrublevskaia Veronika Viktorovna (a)*, Mamaeva Alena Igorevna (b),
Vinokurov Gennady Mikhailovich (c)
*Corresponding author

(a) Irkutsk State Agrarian University named after A.A. Ezhevsky, 1, Molodezhny, Irkutsk, Russia,
v.v.v.3650@mail.ru

(b) Irkutsk State Agrarian University named after A.A. Ezhevsky, 1, Molodezhny, Irkutsk, Russia, tera2805@mail.ru

(c) Irkutsk State Agrarian University named after A.A. Ezhevsky, 1, Molodezhny, Irkutsk, Russia, kfa@igsha.ru

Abstract

Stability of supply in any food market, including that of pig farming products assures provision of food security of the region, solution of priority tasks of the state in the area of import substitution and provision of population with quality food products. In order to analyze formation of supply in the pig farming products market in the condition of reproduction process, a generalized system of indicators has been developed that takes into account the level of production and consumption of agricultural products per capita. This method allows evaluating the supply level in the market as well as finding opportunities for increasing the production output and market saturation. In Irkutsk oblast, the supply level in the pig farming products market is insufficient, as local agricultural producers do not produce enough goods to achieve the level of food security as stipulated in the Doctrine in comparison with the actual level of consumption of this type of products. At that, there is a stable growth in regional pork production. The main producers in the oblast are agricultural organizations and family households. Over time, the share of family households in production gradually decreases. There is only one large-scale pork producer, namely Usolsky Svinokompleks, which has advanced technologies and equipment for pork production and is the leader among the local producers, producing about 60 % of all pork in the region. Regional pork market has a significant potential for development. Cooperation between producers and authorities will allow increasing the appeal of the pork market.

2357-1330 © 2020 Published by European Publisher.

Keywords: Market, supply, pig breeding, reproduction, analysis, Irkutsk.



This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 Unported License, permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

1. Introduction

Expanded reproduction in agriculture is not only a goal set by the state to achieve import substitution objectives and food security of the country, but also provides stable supply to the market. (Batov, Dzhugkaeva, & Tambieva, 2011; Nechaev, Ognev, & Antipina, 2017; Tyapkina & Ilina, 2018). Stable supply to the market shall provide food security of the region and that of the country as a whole (Baryshnikov & Cherdantseva, 2012; Buzdalov & Frumkin, 2014). Provision of population with quality food is among the more important tasks of the state, which may be solved by development of food market, including the pork market.

2. Problem Statement

Production forms the foundation for subsequent consumption, while the consumption serves as the principal commissioner for production, thus, production of agricultural products shall happen in a continuous cycle (Nechaev, Antipina, & Prokopyeva, 2014). The society needs ever-growing consumption. Thus, the processes of production and consumption are intimately interlinked and complement one another (Danilova, 2012; Tyapkina, Vrublevskaia, & Samarukha, 2019). Formation of supply in the pork market integrates the processes of production and consumption, which is an integral part of the reproduction process in agriculture (Kostiuchenko & Sidorova, 2013; Ushachev, Borkhunov, Sagaidak, & Maslova, 2003).

In order to analyze formation of supply in the pig farming products market in the context of reproduction process, a generalized system of indicators has been developed that takes into account the per capita levels of production and consumption. This method allows evaluating the supply level in the market, finding out whether it is sufficient and if there are any possibilities for increasing the production or if the market is saturated.

3. Research Questions

Pork market in the region and in Russia as a whole is developing following the common market laws. The market is being globalized, its producing participants are undergoing intensive merger, increasing the production output and perfecting the technologies. Application of industrial technologies in pork production neutralizes seasonality related to regional climate, thus providing constant production output. Industrial pig farming is a system that integrates all the processes from animal breeding to sale of final product (Anishchenko, 2017).

Development of pig farming as a sector is defined by its economic benefits. Early maturation and high productivity of animals have a positive effect on investment return. Domestic pig farming products are quite viable commercially and may break into a world market. Stable demand for pig farming products ensures development of the sector as well as that of the market as a whole. It is evident from the stable second position that pork takes in all the categories of meat in the market. Pork gives some way to poultry and is significantly ahead of beef. It is among the leaders in protein content and is affordable to the majority of the country's population. It is hard to imagine sausage and other manufactured meat products without pork in their composition. Today, there are 24 agricultural organizations in Irkutsk

oblast, one of them is a large-scale vertically-integrated pig-breeding complex. SKhPK Usolsky Svinokompleks was founded during Soviet times with the capacity of 108 000 animals; currently the enterprise has advanced technologies and equipment for pork production and is a leader among local producers. About 90 % of the pig farming products produced by agricultural organizations are produced there. All around, there are 9 profitable agricultural organizations (Usolsky Svinokompleks is one of them) and 15 loss-making ones, as the financial results of business activities in Irkutsk oblast show.

The large share of loss-making enterprises (62.5 %) is explained by the companies having small pig stock, low productivity and high labor costs. Prime costs of their products is significantly higher than the selling price. As for the profitable organizations, they try supporting productivity and stock at average levels, thus allowing for net financial gain. Besides, there are also agricultural co-operatives, which acquire pigs from small household farms, perform initial processing and sell the product as their own. Such a scheme allows them to get additional profit and increases commercialization of production. Grouping for pig stock have shown that in Irkutsk oblast there are 20 enterprises (86,9 %) with the stock of under 1000 animals, the other 3 have more than 1000 animals; Usolsky Svinokompleks has the pig stock of over 100 000 animals (Mamaeva & Vinokurov, 2016).

4. Purpose of the Study

Analysis of supply in the market of pig farming products of Irkutsk oblast for different categories of producers in the conditions of reproductive process.

5. Research Methods

Indicators were selected for analysis of supply in the market, and a method has been developed that is based on the reproduction principles. It allows evaluating the level of supply in the market, establishing possibilities for increasing production output, evaluating market saturation, providing suggestions for development and making predictions.

The method was tested on the pig products market of Irkutsk oblast; the analysis was based upon accounting statements of the agricultural producers and statistical data. The research covered 24 agricultural organizations, as well as small and individual farms involved in production of pig farming products.

The method for analysis of supply in the market taking into account the conditions of reproduction process consists of analysis of a set of observation objects Y_j ($j=1,2,3,\dots,m$), which are the pork producers. At that, each of the surveyed objects is characterized with n properties, thus, it may be represented as $Y_j = (x_{j1}, x_{j2}, x_{j3}, \dots, x_{jn})$, where x_{ji} is the value of i -th property of the j -th object. In order to form a set of properties characterizing the surveyed objects from the point of view of supply evaluation, the following indicators were used:

1. Production output of pork for slaughter in carcass weight per category of enterprise, tons;
2. Pork consumption per capita per year, kg;
3. Pork production per capita per year, kg;
4. Self-sufficiency with pork, %.

At the first stage of supply analysis for the pork market in conditions of reproduction, the principal categories of pork producers in Irkutsk oblast were analyzed (see Table. 1).

The bulk of the pork production is concentrated in agricultural organizations. Growth of production in this category of enterprises for the analyzed period is 97 %. The opposite situation is with the farm enterprises and individual farms, where decrease in production output over the same period amounted to 30 and 22 %, respectively. In general, Irkutsk oblast has an extended type of reproduction in pig farming, as production of pork for slaughter demonstrates a growth of 1.2 % per year by means of increasing production capacity of the agricultural organizations.

Pig farming as a whole demonstrates globalization and transition to industrial production. It is easier for producers to sell their product directly on the market after processing, without an intermediary, which is also good for consumers. The price of goods from industrialized enterprise is more attractive to the customers. Besides, the product range of small-scale producers is limited, which in the market conditions reduces their competitiveness.

Table 01. Production of pork for slaughter in carcass weight per categories of enterprise for Irkutsk oblast, 2008-2018, thousand tons

Year	All categories	Agricultural organizations	Farm enterprises	Individual farms
2008	27.4	9.1	2.7	15.6
2009	27.2	9.9	2.8	14.5
2010	27.9	10.9	2.8	14.2
2011	29.7	12.8	2.9	14.0
2012	31.7	14.4	3.0	14.3
2013	31.5	15.0	2.7	13.8
2014	30.1	15.4	2.3	12.4
2015	30.5	15.8	2.4	12.7
2016	29.9	16.5	2.0	11.4
2017	30.2	17.2	2.0	11.0
2018*	30.9	17.9	2.1	10.9
2018 to. 2008 ratio	1.13	1.97	0.78	0.70

In order to evaluate self-sufficiency of Irkutsk oblast's market with pig farming products, production and consumption of pork were analyzed (see Table 2). The share of pork produced within the territory of the region rarely exceeds 55 %, which negatively affects provision of population with locally produced quality pork. In order to displace imported products and increase food security of the oblast, it is necessary to develop production in the region (Mokhnachev, Shumkova, & Shumkov, 2015; Shevkunova, 2014).

Table 02. Production and consumption of pork per capita, self-sufficiency with pork for the population of Irkutsk oblast for the period of 2008-2018.

Year	Pork consumption, per person per year, kg	Pork production per person per year, kg	Self-sufficiency with pork, %
2008	20	11	55.0
2009	20	11	55.0
2010	21	11	52.4

2011	22	12	54.6
2012	23	13	56.5
2013	23	13	56.5
2014	23	12	52.2
2015	24	13	54.2
2016	24	14	58.3
2017	24	13	52.2
2018	24	13	53.6
2018 as % of 2008	150	140	-1.4 ppt

Production of pork per inhabitant of Irkutsk oblast is 7.5 kg short of what is required to provide food security. Consequently, complete provision of the oblast's population with local pork in the context of requirements for food security would require increasing production output by 18.15 thousand tons of pork (see Table 3).

Table 03. Calculations for provision of Irkutsk oblast's population with pork products in the context of food security requirements as of 2018

Indicator	Per one person, kg	Per total population, thousand tons
Population of the Irkutsk oblast, thousands.	–	2404.2
Pork needed to provide food security	20.4	49.05
Pork production in carcass weight	12.9	30.9
Pork consumption in Irkutsk oblast	24.0	57.7
Deficit of pork for provision of regional food security	7.5	18.15

Increased supply in the pork market from local producers will allow for gradual displacement of imported products and increase food security in this area and also establish export of pig farming products.

6. Findings

During the period in question, agricultural organizations of Irkutsk oblast increase their production output and in 2018 the production output per person per year reached 13 kg, which is 18 % higher than in 2008. However, this level is lower than the medical norm for pork consumption (16–20 kg) and lower than the actual pork consumption in the oblast (24 kg) by 45.8 %. Thus, the supply level in the regional market of pig farming products is insufficient. At that, pig farming in the region is of the expanded type, which is formed by means of agricultural organizations, but it is insufficient, so it is necessary to increase production output in other categories of producers as well. Specific characteristics of supply formation in the regional pork market are as follows:

- 1 The principal producers in the oblast are agricultural organizations and individual farms, but the share of the latter is constantly dropping;
- 2 Small and medium producers need breeder pigs to increase independent production of pork;
- 3 Only one enterprise is involved in large-scale pig farming, namely SKhPK Usolsky Svinokompleks;

- 4 There is a stable growth in pork production by agricultural organizations;
- 5 Supply of pork is represented in the following types of production: chilled or frozen pork after primary treatment, organ meat, processed foods, sausages, smoked meat products;
- 6 There is a shortage of pork production in the region in the context of provision of regional food security.

The regional market of pork products has a significant potential for further development. Cooperation between producers and authorities will allow making the pork market attractive for consumers.

Generally, there are still pressing problems with creating pig breeding organizations and construction of a large-scale industrial complex for 100 000 pigs. Construction of such a large project is possible only on condition of well-coordinated work of government and entrepreneurs. This construction requires significant investments, impossible without state support (Maydanevich, 2017). The state support may be in the form of lowering the interest for development loan, from 20–30 to 5–7 % per year. Reduced cost of development loans will stimulate the sector's development.

7. Conclusion

Currently, to ensure food security of the region, provide population with quality food products and solve a high priority task of import substitution, it is necessary to provide stable supply in the regional pork market. In Irkutsk oblast, the supply level in this market is insufficient. Local agricultural organizations produce insufficient amount of products to cover neither medical norm of consumption nor the actual regional consumption.

The main producer in the Irkutsk oblast is a single large-scale enterprise. Most enterprises and organizations involved in pig farming are small and largely non-profitable subjects. This situation is not good for provision of food security of the region. If Usolsky Svinokompleks stops production for any reason, it will leave Irkutsk oblast virtually without locally produced pork and pork products.

References

- Anishchenko, A. N. (2017). Current Problems and Perspectives for the Development of Pig Farming. *J. Probl. of Territory's Developm.*, 4(90), 146–160.
- Baryshnikov, N. G., & Cherdantseva, E. A. (2012). *Reproduction in agriculture: priorities and prospects*. Penza: RIO PGSCHA.
- Batov, G. H., Dzhugkaeva, L. Z., & Tambieva, J. A. (2011). Specifics of managing the reproduction process in agriculture. *Econ. and managem.*, 12(85), 154–157.
- Buzdalov, I. N., & Frumkin, B. E. (2014). Situation in agribusiness is a thread to not just food security, but to the national security of Russia. *Econ. Strateg.*, 8, 68–77.
- Danilova, M. N. (2012). *Methodological foundation of research into development of agroindustrial production*. Tomsk: Tomsk State Univer. of Architect. and Construct.
- Kostiuchenko, T. N., & Sidorova, D. V. (2013). *Features of reproduction process in agriculture*. Stavropol: AGRUS.
- Mamaeva, A. I., & Vinokurov, G. M. (2016). Production of pig farming products in solving the task of meat import substitution in agricultural and food market of Irkutsk oblast. *Econ. and Entrepreneurship*, 13(1), 373–376.
- Maydanevich, P. N. (2017). Priority Directions of State Regulation of the Organizational and Economic Mechanism of Pig-Breeding Production. *J. Sci. and ed.: econ.; enterprise; law and managem.*, 6(85), 14–22.

- Mokhnachev, S. A., Shumkova, Y. G., & Shumkov, N. V. (2015). Prospects of the Pig Industry in the Region. *J. Fundam. Res.*, *11*, 595–599.
- Nechaev, A. S., Antipina, O. V., & Prokopyeva, A. V. (2014). The risk of innovation activities in enterprises. *Life Sci. J. (LSJ), USA*, *11*(11), 574–575.
- Nechaev, A. S., Ognev, D. V., & Antipina, O. V. (2017). Innovation risks: challenges and prospects. Proceedings of the International Conference on Trends of Technologies and Innovations in Economic and Social Studies 2017. *Advan. in Econ., Busin. and Managem. Res.* (pp. 7-12). <https://doi.org/10.2991/ttiess-17.2017.2>
- Shevkunova, E. S. (2014). Analysis of Food Products Consumption Level. *J. Sci. J. of KubSAU*, *101*(07), 1–16.
- Tyapkina, M. F., & Ilina, E. A. (2018). Assessment of the Reproduction Process of Agricultural Enterprises. *International journal of ecological economics and statistics*. *39*(1), 171–179.
- Tyapkina, M. F., Vrublevskaia, V. V., & Samarukha, V. I. (2019). Assessment of reproduction of agricultural products. *IOP Conf. Ser. Earth and Environm. Sci.*, *315*(2). <https://doi.org/10.1088/1755-1315/315/2/022092>
- Ushachev, I. G., Borkhunov, N. A., Sagaidak, E. A., & Maslova, V. V. (2003). *Economic issues with reproduction in the Russian agribusiness*. Moscow: Encyclop. of Russ. Villages.