The European Proceedings of
Social & Behavioural Sciences
EpSBS

ISSN: 2357-1330

https://doi.org/10.15405/epsbs.2019.12.05.54

MTSDT 2019

Modern Tools for Sustainable Development of Territories. Special Topic: Project Management in the Regions of Russia

INNOVATION IN DAIRY PRODUCTION AS THE BASIS OF EFFECTIVE MANAGEMENT

L. P. Semkiv (a)*, M. V. Semkiv (b), N. I. Grishakina (c), S. V. Stanevich (d)
*Corresponding author

(a) Yaroslav-the-Wise Novgorod State University, ul. B. St. Peterburgskaya, 41, Veliky Novgorod, Russia, Lidiya.Semkiv@novsu.ru
(b) Yaroslav-the-Wise Novgorod State University, ul. B. St. Peterburgskaya, 41, Veliky Novgorod, Russia, Mikhail.Semkiv@novsu.ru
(c) Yaroslav-the-Wise Novgorod State University, ul. B. St. Peterburgskaya, 41, Veliky Novgorod, Russia, Nadezhda.Grishakina@novsu.ru
(d) Yaroslav-the-Wise Novgorod State University, ul. B. St. Petersburgskaya, 41, Veliky Novgorod, Russia, Svetlana.Stanevich@novsu.ru

Abstract

Scientific research and the practice of leading enterprises show that the main condition and key factor in increasing the competitiveness of the production of quality milk is the organization of effective management. Solution of the problems of improving manageability in production and improving the quality of milk requires a transition to new technologies. The use of digital technologies, the active introduction and use of "smart" automated systems for managing production processes for making timely strategic decisions in production are of priority importance in modern conditions. Studies show that it is necessary to increase the level of organization systematically in order to achieve the challenges facing the industry. Therefore, the creation of an effective management system should be paramount for most milk producers. An understanding is increasingly being formed of the need to solve innovative problems systematically when real goals are defined in the Novgorod region. At the same time, the mandatory participation of specially trained personnel in this process, able to find ways to transform and form a competitive milk production is important. Management evaluation in dairy production was implemented through a system of interrelated social and economic indicators, allowing a comprehensive analysis of the state and effectiveness of enterprises. A survey of the heads of agricultural enterprises conducted during the study confirmed that in the conditions of the innovative development of rural territories, the totality of organizational, technological, methodological methods carried out using certain procedures makes up the process of managing milk production.

© 2019 Published by Future Academy www.FutureAcademy.org.UK

Keywords: Administration, effective management, innovation, milk production.

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.

https://doi.org/10.15405/epsbs.2019.12.05.54
Corresponding Author: L. P. Semkiv
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

1. Introduction

It is necessary to increase the level of organization of production and its effectiveness to implement the tasks facing dairy production. Therefore, the primary task for the majority of milk producers should be the creation of an effective management system that will help to eliminate the imbalances between economic opportunities and the quality of life, between the requirements of the labor market and the quality of personnel, between progressive forms of labor and old forms of management.

It is known that in modern conditions the foundation is laid for the success of those enterprises that increase production volumes and improve milk quality based on the latest scientific developments in order to increase labor efficiency and productivity (Kozina & Semkiv, 2016). At the same time, scientific and technological progress, which is an important factor in economic development worldwide, is associated with the concept of the innovation process, as this is the only process that combines science, technology, economics, entrepreneurship and management. Enterprises with an innovative type of behavior implement a whole range of scientific, technical, technological, organizational, financial and commercial activities, which together lead to the appearance of various types of innovations. Today, digital technology is a priority. To accelerate the development of the agricultural sector, the Ministry of Agriculture of Russia is actively participating in the implementation of the "Digital Economy of the Russian Federation program" with the departmental project "Digital Agriculture", whose goal is the transformation of the agricultural sector and a technological breakthrough. The project provides for the widespread introduction of digital technologies and modern equipment by agricultural producers and market participants, the launch of digital monitoring platforms for the production and movement of agricultural products based on proven predictive mathematical models, the optimization of sales and the reduction of the shortage of IT specialists in the agricultural sector that can support digital solutions.

2. Problem Statement

At present, despite all the positive trends and available growth points in the agro-industrial complex the innovative focus is not enough in many territories at all levels of management. As research and the studied experience of agricultural enterprises show, innovations in dairy production were directed more to the elements of technological processes. However, an integrated approach to the implementation of innovative techniques should be taken into account to improve management efficiency in dairy production. In this regard, research is needed on a wide range of problems that have arisen during the development of dairy farming and an analysis of the potential for its innovative development to develop a scientifically based effective management system.

3. Research Questions

- Development of basic approaches to increase the efficiency of dairy farming through the development of innovative processes.
- Creation of a science-based effective management system based on innovative approaches used in agricultural production.

https://doi.org/10.15405/epsbs.2019.12.05.54
Corresponding Author: L. P. Semkiv
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

- Improving innovation in the production of milk with a focus on regional characteristics: to reconstruct existing (obsolete) and build new dairy farms and complexes using advanced domestic and foreign experience, scientific research; stimulate the attraction of extrabudgetary investments and increase the effectiveness of management from the standpoint of modern technologies, including digital. Formation of a well-trained reserve of leading personnel, since only an effective personnel policy will ensure high socio-economic results in the sustainable development of rural territories.

4. Purpose of the Study

The purpose of the study is the theoretical justification and development of guidelines for improving the organization and increasing the efficiency of milk production.

5. Research Methods

The methods of monographic, comparative and system analysis, a logical approach are applied in the work.

One of the main research methods is a theoretical analysis of sources - publications of foreign authors on a scientifically-based system of effective management based on innovative approaches used in agricultural production and its management features (Krapchina & Kotova, 2015; Konstantinov, Koshlich, & Mussayeva, 2018; Crowe, Hostens, & Opsomer, 2018; Bolman & Deal, 2017; Djedovic, Karabegovic, Avdagic, & Omanovic, 2018).

Research of domestic scientists on this issue, the best practice of economic entities of the agro-industrial complex is studied.

6. Findings

The modern development of the dairy industry is impossible without the introduction and application of innovations and innovative technological solutions, since the level of activation of the latter determines the general level of competitiveness of milk production. Systematic development of innovations, concentration and intensification of milk production provide a high degree of mechanization and automation of production processes, high labor productivity, resource conservation and product quality.

The success of the economic activities of enterprises is associated with the correct consideration of risk factors that affect the production and financial results of dairy farming (Surovtsev & Nikulina, 2010). We believe that the use of practical measures to minimize the consequences of risks in the activities of enterprises engaged in the production of milk can increase efficiency, and the correct and consistent application of a set of these measures can become the key to successful and sustainable socio-economic development of rural areas. Most of the manufacturing innovations in the dairy industry of the region have been introduced since the mid (end) of the 90s. This allowed accumulating sufficient experience in their development, taking into account regional specifics more fully, and reducing innovative risks with their wide distribution. So, when harvesting a silo, several innovations were introduced simultaneously:

https://doi.org/10.15405/epsbs.2019.12.05.54
Corresponding Author: L. P. Semkiv
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

1) modern high-performance forage harvesting equipment, which can significantly reduce the time of forage harvesting; 2) biological preparations for silage, improving feed safety; 3) advanced silage technology. Each individual innovation increases operational efficiency: productivity increases, costs are reduced. Innovations in the production of grain fodder made it possible, as in the preparation of bulky feed, to neutralize the competitive disadvantages associated with the climatic features of the zone, transforming it into additional competitive advantages. The cultivation of feed grain by agricultural organizations reduces the risk of price fluctuations in the market, which is especially true in the face of growing crisis in the global economy.

The introduction of intensive technologies and modern management in the practice of farms in the Novgorod region has significantly increased milk production. During the analyzed period, positive dynamics is clearly observed in the region (over the past fifteen years, the average annual milk yield has increased by 95%). At the same time, high milk productivity is a necessary but not sufficient condition for competitiveness. There is an objective need for innovative automated herd management systems (it monitors animals, monitors their productivity in the current mode, and makes decisions promptly). Dairy production must be successful and profitable with a properly organized management system and all technological methods.

Pilot farms mastering “smart” automated and computerized systems from leading world manufacturers appear in Russia. Effective computer support requires the use of software not only for project management (for example, Microsoft Project), but also for database management, mathematical modeling, word and table processors, creating presentations and other (Volgina, 2017). Currently, various programs are being introduced in domestic dairy farming that improve management. The advantages of introducing computer automation are a significant reduction in manual labor costs and a decrease in the complexity of document management, as well as an increase in the efficiency and accuracy of calculations.

Specialists of the Regional Center “PLINOR” of the Leningrad Region developed a AWS program “SELEX” for the organization of effective selection and stock breeding work in dairy farming. According to the experts of agricultural enterprises the programs “SELEX. Dairy cattle”, “SELEX. Feed rations”, “Coral” and others save a huge amount of working time and greatly simplify analytical work.

Based on the analysis, it should be noted that labor productivity on dairy farms cannot be raised to a high level only due to technical support. Innovative technologies that will consider the physiological characteristics of animals are required. One of the innovations in dairy farming is the rumination sensor, which is responsible for the reduction of scar walls (rumination) and the overall activity of the animal. Advanced analytical system De Laval “Herd Navigator” allows improving production efficiency, profitability, living conditions of animals and ensuring food safety.

Currently, tags are used for labelling farm animals. But, they often fall out, get lost, and for this reason it can be difficult to identify animals. To eliminate such phenomena, modern identification technologies have been developed – electronic tagging or animal chipping (Timoshenko, Musyca, & Moskalev, 2015). The use of electronic identification in agricultural enterprises of the region will optimize production processes and significantly increase the speed of accounting, analysis, conducting various livestock and veterinary measures and making timely strategic decisions in production.

https://doi.org/10.15405/epsbs.2019.12.05.54
Corresponding Author: L. P. Semkiv
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

In our opinion, the emergence of robotic milking equipment is a real breakthrough to ensure the innovative development of dairy production. The VMS (Voluntary Milking Sysytem) is designed to optimize milking and ensure hygienic conditions for the animal, eliminating the influence of the human factor. The main problem in their distribution is the high cost. However, the number of robots in Russia is growing, even the owners of family farms are buying them (Byshova, Tunikov, Morozova, Musaev, & Ivanova, 2013; Morozova, Musaev, Podol, & Ulkina, 2014).

The Mercury information system for veterinary certification has been introduced and is functioning since 2018 to solve the problem of selling low-quality (falsified) milk in Russia. Russian Minister of Agriculture Dmitry Patrushev notes that the analysis of information system data should become the basis for supervisory bodies to make management decisions.

In the management of modern dairy production, the role of the manager (administrator) is increasing. According to foreign experts, the difference in milk production between the complexes, depending on the management, ceteris paribus, reaches 50%. In this regard, the active introduction and use of automated process control systems in the region's enterprises will provide an increase in the quality of decisions made, reduce management costs, timely detect and prevent technological violations, which in turn will increase the overall production efficiency.

Based on the research, key problems that hinder the targeted, sustainable and effective development of dairy farming should be highlighted. Thus, the need to replace obsolete equipment and the development of new technologies in order to increase the competitiveness of products is being realized at a slow pace. In addition, one of the significant reasons for the negative processes that took place in the industry was the elimination of large farms and complexes. Therefore, increasing the concentration level to the optimum size, restoring specialized industrial-type dairy complexes should be the main guideline in the implementation of the technical and social policy for the development of the industry.

In recent years of close cooperation with agricultural organizations and enterprises of the region, we have developed an innovative mechanism for conducting and implementing scientific research in agricultural production in the Novgorod region. Testing of scientific developments by scientists of the Institute of Agriculture and Natural Resources (IANR) of Yaroslav-the-Wise Novgorod State University is carried out jointly with organizations (OOO "Ermolinskoye", SEC "Levochsky", collective farm "Rossiya" SEC) and agricultural enterprises of the region through scientific and practical conferences, seminars, fairs, exhibitions and other events, publication of materials in scientific collections. Exhibitions are a tool for identifying the most effective innovations that deserve priority use in agricultural production.

An important component of a dynamically developing agricultural production is its personnel potential, since in general, the development of market relations of the agricultural sector of the region depends on the management efficiency, changes in the structure and location of agricultural production, and the use of innovative technologies (Nikiforov, & Semkiv, 2011). Achieving high results largely depends on what kind of specialist managers are involved in production, how much research and development experience is used, and who is entrusted with high-performance equipment.

https://doi.org/10.15405/epsbs.2019.12.05.54
Corresponding Author: L. P. Semkiv
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

Improving the efficiency of the agricultural sector largely depends on providing the industry with personnel with new economic thinking, a high level of general culture, professionalism, legal literacy, motivated by the end results of labor, capable of introducing innovative technologies and ensuring the production of competitive products. Personnel monitoring was carried out in order to assess the impact of professional competence of personnel on the process of implementation of the main areas of innovation in the industry. As the analysis shows, 60% of respondents noted the improvement of the personnel management system, i.e. work in such areas as stimulating labor activity of personnel, staff rotation, rational distribution of functional responsibilities between employees and departments and improving the organizational structure. At the same time, the rest of the respondents equally felt that the optimization of the number of employees and the development of human resources (investing in staff, establishing a continuous training system, advanced training, retraining, drawing up individual plans for young employees) are more significant in modern conditions. Lack of attention to these areas of personnel policy leads to a number of negative consequences: the deterioration of the main qualitative and quantitative characteristics of agricultural personnel, and the violation of their rotation at all levels of management. There is an acute shortage of highly qualified managerial personnel. It is necessary to create and organize a professional approach in providing the region's industry with new generation personnel to solve the existing problem, since their insufficient qualification in many cases is the main obstacle to the transition to the technical system, the introduction of innovations in the agricultural sector.

Modern production, aimed at identifying reserves and a clear business project work, to a large extent requires professionally competent innovative managers, specialists who are skilled in systems analysis and modeling of complex dynamic production systems. It is in these conditions that the organization of training of managerial personnel of the agro-industrial complex at a new qualitative level is of particular importance. Given the ongoing changes in higher agricultural education (a two-stage training system), it should be noted that the classroom load of managerial and economic modules was significantly reduced in the bachelor's curriculum. The innovative vector of the development of the agro-industrial complex in the conditions of globalization of our time requires new approaches. In this regard, work in programs of additional professional education has been intensified in agricultural universities. The field of professional retraining is one of the most innovative, changes in which largely determine the competitiveness of the agricultural sector. The implementation of the professional management training program "Management in the agro-industrial complex" in IANR is aimed at improving and obtaining new competencies necessary for the manager's innovative activities, as well as at raising the professional level within the framework of the existing qualifications of agricultural training areas. Purposeful work on the formation of a reserve of managers and specialists for rural areas is an important component in the personnel management system. We believe that the measures taken in recent years to improve the system of training and retraining of agricultural personnel will help to strengthen positions in this direction of the economy and to reach a higher level, which in turn will have a positive impact on improving the living standards of the rural population.

Based on the study, we found that the training of innovation-oriented specialists for the agricultural sector and innovative approaches to the organization of dairy farming, achieved through the introduction of creative entrepreneurial solutions, will strengthen and form a solid agricultural base in the

https://doi.org/10.15405/epsbs.2019.12.05.54
Corresponding Author: L. P. Semkiv
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

region. Improving innovation with a focus on regional characteristics are the main tasks of state support for the agricultural sector. The main efforts in the personnel policy of the region should be focused on the formation of a well-trained reserve of leading personnel, capable of providing an effective solution to the tasks set, since only an effective personnel policy will ensure high socio-economic results in the sustainable development of rural areas.

7. Conclusion

The strategic priorities for the development of dairy farming are scientific and technological progress and innovative processes that allow continuous updating of production based on the development of technological and scientific achievements. The need to develop and improve innovative activities with a focus on regional characteristics, creating organizational and economic conditions in the regions that stimulate the development of innovative processes, are the main tasks of state support for dairy farming.

At the same time, the active introduction of automated control systems, as our studies confirm, ensures an increase in the quality of decisions made, reduces the costs of managing the dairy complex, timely identifies and prevents technological violations, which increases the overall performance. Consequently, in the management of the modern dairy complex, the role of the manager (administrator) is increasing, providing technological regulations and production efficiency.

Those enterprises where the issues that determine the competitiveness of milk production can function, develop and withstand the competition can be stable (Semkiv, Nikiforov, & Semkiv, 2011). The introduction of intensive technologies and modern management in the practice of enterprises of the Novgorod region engaged in the production of milk, has significantly improved productivity. However, in order to further resolve issues regarding the system of innovative management of dairy farming by farms in the region, it is necessary to do the following: to reconstruct existing (obsolete) and build new dairy farms and complexes using advanced domestic and foreign experience, scientific developments; stimulate the attraction of extrabudgetary investments and increase the effectiveness of management from the standpoint of modern technologies, including digital ones.

Based on the analysis of domestic and foreign experience, we found that in modern conditions digital networks and smart farms, the latest achievements of genetics and selection, molecular biology and biotechnology are the technological base of agricultural producers. In these conditions, specialists of a fundamentally different level and quality should work. Agricultural universities should be more actively involved in various programs and projects implemented by both authorities and development institutions, including projects of the Russian Ministry of Education and Science, the Russian Science Foundation and the Russian Foundation for Basic Research. At the same time, leading universities should promote the development of a mentoring system and the dissemination of best practices.

Acknowledgments

The authors are grateful to Anna Kozina, Director of IANR, Professor of NovSU, Aleksandr Fedorovsky, director of SEK “Levochsky”, director of OOO “Ermolinskoye” Viktor Vitvitsky, director of collective farm “Rossiya” Nikolay Andreev for their help in the research.

https://doi.org/10.15405/epsbs.2019.12.05.54
Corresponding Author: L. P. Semkiv
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

References

Bolman, L. G., & Deal, T. E. (2017). *Reframing Organizations: Artistry, Choice, and Leadership*. Hoboken, NJ USA: John Wiley & Sons INC.

Byshova, N. G., Tunikov, G. M., Morozova, N. I., Musaev, F. A., & Ivanova, L. V. (2013). *Innovative technology for milk production*. Ryazan: RGATU.

Crowe, M. A., Hostens, M., & Opsomer, G. (2018). Reproductive management in dairy cows – the future. *Irish Veterinary Journal, 71*(1).

Djedovic, A., Karabegovic, A., Avdagic, Z., & Omanovic, S. (2018). Innovative Approach in Modeling Business Processes with a Focus on Improving the Allocation of Human Resources. *Mathematical problems in engineering*. https://doi.org/10.1155/2018/9838560

Konstantinov, V., Koshlich, Y., & Mussayeva, D. (2018). Management Innovations for Enterprise Development and Effective Decision Making. *Journal of Entrepreneurship Education, 21(2S)*.

Kozina, A. M., & Semkiv, L. P. (2016). Human resources in the management of milk production. Effective management in dairy cattle breeding is a condition for the competitiveness of milk production: materials of the All-Russian scientific-practical. conf., (pp. 26-27). Veliky Novgorod: NovSU.

Krapchina, L., & Kotova, L. (2015). Innovations in the Dairy Production Industry as the Basis for Competitive Ability of National Companies. *Food Policy and Security, 2(2)*. doi: 10.18334/ppib.2.2.565 [in Russ.]

Morozova, N. I., Musaev, F. A., Podol, S. R., & Ulkina, M. A. (2014). Automated herd management system in megafarm conditions. *Dairy industry, 7*, 33-34.

Nikiforov, P. V., & Semkiv, L. P. (2011). Changing the structure and location of agricultural production at the present stage of its development. *Nikon readings, 16*, 40-42.

Semkiv, L. P., Nikiforov, P. V., & Semkiv, M. V. (2011). Directions of development of dairy cattle breeding in the region. *Agrarian Bulletin of the Urals, 8*, 87-88.

Surovtsev, V. N., & Nikulina, Y. N. (2010). Regional features of integration processes and their impact on innovation and investment in dairy farming in the Leningrad Region. *Nikon readings, 15*, 81-83.

Timoshenko, V., Musyca, A., & Moskalev, A. (2015). Electronic animal identification. *Zhivotnovodstvo Rossii, 7*, 57-60.

Volgina, N. A. (2017). Review of the book: Baldwin R.E. The Great Convergence: Information Technology and the New Globalization. Cambridge, Massachusetts: The Belknap Press of Harvard University Press, 2016. – 344 p. *Vestnik RUDN. International Relations, 17*(4), 866-873. https://doi.org/10.22363/2313-0660-2017-17-4-866-873