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DOI: [https://doi.org/10.32515/2663-1636.2022.8\(41\).20-27](https://doi.org/10.32515/2663-1636.2022.8(41).20-27)**Lyudmyla Zapirchenko**, Associate Professor, PhD in Economics (Candidate of Economic Sciences)*Central Ukrainian National Technical University, Kropyvnytskyi, Ukraine***Mariia Buhaieva**, Associate Professor, PhD in Economics (Candidate of Economic Sciences)*Central Ukrainian National Technical University, Kropyvnytskyi, Ukraine***Alina Zbarzhevetska**, applicant*Lviv Polytechnic National University, Lviv, Ukraine*

World and Domestic Trends in the Production of Dairy Products

In modern economic conditions, the dairy industry, on the one hand, belongs to the complex in both organizational and technological aspects of its components, and on the other hand, it is an industry that remains a leader in animal husbandry. The study is to consider current trends in dairy production, identify areas for increasing milk production in farms and identify practical recommendations for possible transformational changes in farms

It is determined that the dairy industry is gaining more importance in the food systems of most countries. The productivity of cows by regions of Ukraine and at the international level in some countries was studied. It was found that the importance of increasing the production of all types of products, especially milk for the development of the livestock industry, and the dairy industry in the agri-food sector to provide the population with wholesome food. Problems that hinder the development of the industry are identified. A number of restraining factors in the development of the dairy industry have been identified, namely: low purchase prices, difficulties with capital construction and modernization of farms and premises due to unprofitable credit policies of financial institutions for farmers, low level of integration of dairy production and processing, low concentration of cows at enterprises, the use of traditional obsolete technologies in the production of raw materials and others.

Thus, the dairy industry, both at the state level and worldwide, needs systematic further intensification and development. Reserves for improving the quality of milk, increasing production can be a system of measures to increase milk productivity of cows and reduce the cost of milk production. Leading measures in the future should be innovative approaches to the development of the industry, based on technology, advanced animal feeding systems, modern technical and technological support, the use of IT technologies, breeding and energy and resource conservation.

dairy farming, dairy industry, milk production, productivity, development, development reserves

Statement of the problem. In modern economic conditions, the dairy industry, on the one hand, belongs to the complex in both organizational and technological aspects of its components, and on the other hand, it is an industry that remains a leader in animal husbandry. An analysis of the current state of dairy farming will identify trends in the development of this industry. Increasing milk production in agricultural enterprises in market conditions will help solve the problem of providing the population with quality products, milk processing enterprises - raw materials and ensure the competitiveness of agricultural producers engaged in milk production.

Analysis of recent researches and publications. The following researchers devoted their works to the issue of prospects for the development of dairy farming in Ukraine in terms of applied aspects of the functioning of farms: V.G. Andriychuk, O.V. Bondar, M.I. Kisil [6], O.A. Kozak [5], S.O. Pashko [2], P.T. Sabluk, I.V. Fedulova [8]. However, the current situation of enterprises in this industry determines the need for research and finding solutions to identify reserves for the development of dairy farming, which will increase efficiency and meeting the needs of dairy products.

Statement of the objective. The study is to consider current trends in dairy production, identify areas for increasing milk production in farms and identify practical recommendations for possible transformational changes in farms. All this will help increase the production of dairy products, as increasing production is one of the key problems of the economy, which requires systematic monitoring of the industry or economy separately.

The main material. Agriculture is a complex of production structures that are interconnected technologically and organizationally, which together provide the population with high quality food, consumer goods made from agricultural raw materials. Each branch of agricultural production is a balanced set of enterprises that form a structurally complete system and produce certain types of homogeneous products or provide services that meet certain needs of the population in food and industry - in raw materials [4]. The main direction of development of the livestock industry is a significant increase in production of all types of products, especially milk. The dairy industry is the most important part of the agri-food sector, an important factor in providing the population with wholesome food and the economic basis of the livestock industry.

The main trends and place of Ukraine in the world dairy market can be traced in the materials of the Food and Agriculture Organization of the United Nations (Food and Agriculture Organization - FAO), USA Department of Agriculture, European Dairy Association and others. The task of scientists of these organizations is to ensure the analysis and forecasting of the dairy industry, which allows to achieve the ultimate goal with the lowest cost of production resources, publish annual reports and forecasts.

Analyzing the reports of world agricultural organizations, we can conclude that the dairy industry is becoming increasingly important in the food systems of most countries. The EU dairy sector, dairy farmers and their private or cooperative milk processors, account for around 160 million tonnes of milk and therefore account for around 22% of world milk production [12].

Cooperation between dairy farmers and processors accounts for about 14% of the EU's total agricultural income. With the growing success of European dairy products in the world, the number of jobs in the EU processing industry is growing too. More than 45,000 direct jobs at dairies are linked to EU dairy exports. More than 12% of all cow's milk produced in Europe is exported outside the EU. The significant part of the trade balance belongs to the export of milk powder and cheese. The EU is a stable partner in the supply of dairy products worldwide. The EU dairy industry is innovative, dynamic and economically powerful.

In this regard, developed countries are making efforts to increase the productivity of the dairy herd. At the same time, cows are growing on farms, especially in developing countries. Each country individually, based on its economic and social development, the level of agricultural development determines the growth rate and production of dairy products.

Like any other livestock industry, dairy farming is a non-profit and cost-effective industry. Therefore, in many countries around the world, dairy farming is the object of state support, which helps many countries with uncompetitive production to achieve full self-sufficiency in dairy products. State support for the dairy industry is manifested in the form of surcharges through subsidies, restrictions on imports, subsidies for the purchase of dairy residues, maintaining a high level of domestic prices, quotas and others.

Recently, there is a tendency in the world to change the structure of dairy farms, their size and function. The number of farms engaged in milk production is declining, there is an increase in production. According to the International Farm Comparison Network (IFCN), the average size of a dairy farm in the world in 2016 was only 3,1 cows, but it increased compared to 2011 by 1,7%. The total number of dairy farms in the world in 2016 amounted to 119,6 million, employing up to a billion people, or 12% of the world's population [9].

According to FAO forecasts [11], livestock will increase by 2026 mostly by 73%, and by 27% - their productivity will increase. Raw milk production by 2026 will increase by 178 million tons, or 22% compared to the period 2014-2016. The average size of a dairy farm in different countries is shown in Table 1.

Table 1 – The average size of dairy farms in some countries

Countries with the largest farm size	The average size of the farm, cows		Countries with the smallest farm size	The average size of the farm, cows	
	2006	2016		2006	2016
Saudi Arabia	3879	6924	Philippines	0,5	0,4
New Zealand	323	419	Nepal	1,3	1,3
South Africa	137	397	Cuba	1,1	1,4
Australia	214	283	Tanzania	3	1,6
Czech Republic	158	218	Albania	1,6	1,7
USA	122	203	India	1,54	1,8
Denmark	93	185	Uzbekistan	2,1	1,8
Israel	103	171	Ukraine	1,4	1,9
Argentina	156	168	Kyrgyzstan	1,9	1,9
Great Britain	108	143	Yemen	1,5	2,1
Cyprus	96,8	133,6	Moldova	2,8	2,1
Uruguay	86	115	Bosnia and Herzegovina	2,7	2,2
Taiwan	82	113	Virmeniya	1,5	2,3
Netherlands	64	97	Uganda	2,5	2,4
Canada	69,5	85	Romania	1,7	2,4

Source: cited by the author for [13]

Among the countries in the world that have dairy farms with a large number of cows, the leader is the Chinese farm Mudanjiang City Mega Farm. The population there is 100,000 cows, followed by an Australian farm with 55,000 cows. The average farm size in European countries, depending on the country, ranges from 2,4 cows in Romania to 143 cows in the UK. In general, over the last 10 years, the size of the average European farm has increased from 9,4 to 18,4 cows. However, large farms are also appearing in the EU. In the future, it is planned to continue to increase the number of livestock on farms, but the largest 9 European countries will keep an average of 116 cows.

In Spain, for example, a farm for 20,000 dairy cows has been built, which will have 3,000 hectares of land to cultivate and provide 300 jobs. The cost of the investment amounted to 80 million euros [13].

The advantages of large farms are that in the process of production there is an opportunity to minimize production costs, efficient use of production assets, implement the latest advances in science and technology, as well as modern management systems. However, scientists also emphasize the threats from the expansion of large-scale farms (intensification of the dairy industry), this applies primarily to the environment - its pollution [12].

In Ukraine, the dairy industry is one of the traditional branches of agricultural production, and its products act as raw materials for many sectors of the agro-industrial complex and determine their future development. Also, the products of this industry for the end consumers are an important component of food security of the country, and trends in its development affect the socio-economic development of Ukraine as a whole.

It was expected that family farming would be widespread at the beginning of the agrarian reforms in Ukraine [5]. However, analyzing the number of family farms in recent years, we find that the creation of family dairy farms and commodity production of agricultural products, which will increase income from their own economic activities has not become widespread. Although the regulatory framework for this has been created, their legal status is enshrined in the Law of Ukraine "On Farming" [1], according to which a family farm can be registered as an individual or can be organized on the basis of an individual entrepreneur. As expected, this form of economic activity will promote the production of quality dairy products and increase revenues from their own economic activities [6].

It is expected to increase the production of dairy products by 2026 according to the forecast of world organizations.

Trends in the development of dairy farming and the results of the functioning of the industry in Ukraine are shown in Figure 1.

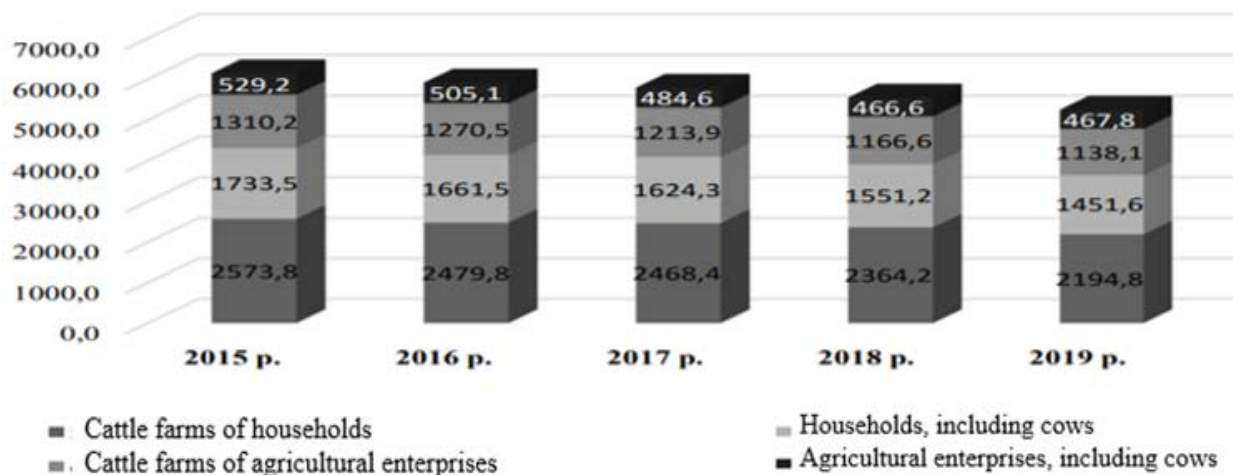


Figure 1 - Livestock in agricultural enterprises and cattle farms of the households of Ukraine on the first of January, thousands of heads

Source: summarized by the author based on [3]

But there are a number of problems that hinder the development of the industry. The first is the volatile situation in the milk market in recent years. This applies to access to world dairy markets. The situation is complicated by unsatisfactory quality indicators of domestic dairy products and non-compliance with international standards. Another problem is the lack of current state support for agricultural producers specializing in milk production, price disparities in industrial and agricultural products, and imbalances in the logistics system.

Analysis of the dynamics of milk production (Fig. 2) gives grounds to argue that in the structure of milk production in Ukraine have a significant share of households. This is a deterrent to the entry of dairy products into foreign markets due to non-compliance with quality standards. But a positive shift is the growth of the share of milk produced by enterprises from 2014 to 2018 in the amount of 3.6%.

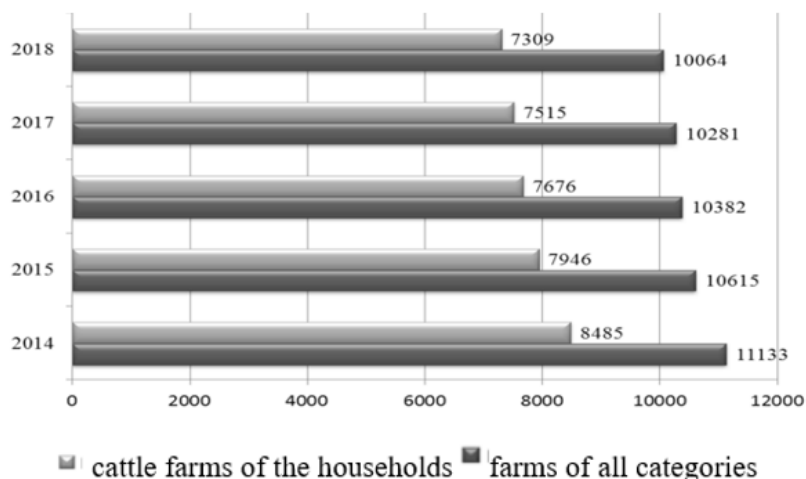


Figure 2 - Dynamics of milk production, thousand tons

Source: summarized by the author based on [3]

Trends in average annual milk yield per cow (Fig. 3) characterize the efficiency of milk production on a technological basis.

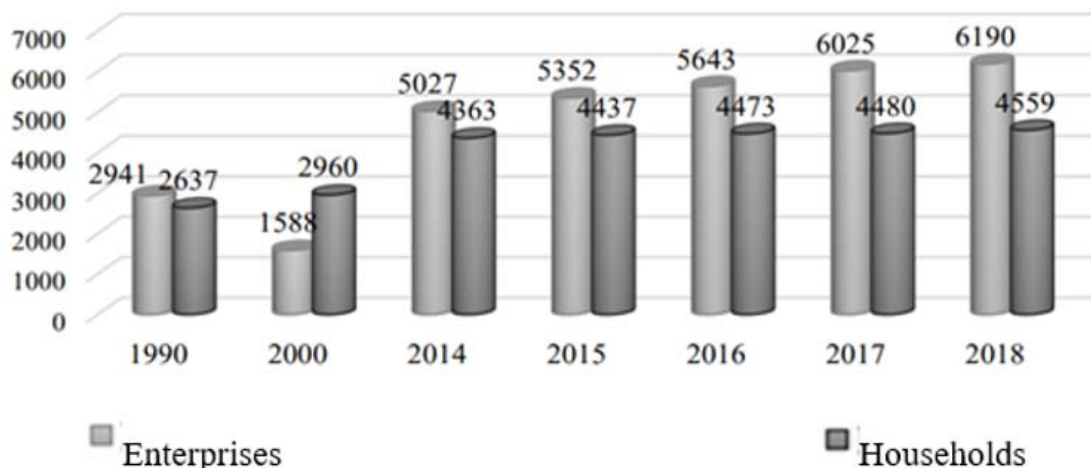


Figure 3 - Average annual milk yield per 1 cow in Ukraine, kg.

Source: summarized by the author based on [3]

There is a positive dynamics of this indicator in Ukraine. The world leaders in cow productivity are Israel - 13182 kg, Korea - 10184 kg, USA - 10457 kg, Denmark - 9749 kg, Estonia - 9176 kg, Canada - 8811 kg, Finland - 8750 kg, Sweden - 8628 kg, Czech Republic - 8103 kg, Poland - 6357 kg. It should be noted that domestic enterprises have a higher level of milk productivity of cows than the households. This is a consequence of the use of more intensive and modern milk production technologies. In the farms of the households also it is not carried out breeding work to improve the breeding characteristics of cattle, which leads to a decrease in milk productivity. It should be noted a positive trend of increasing milk productivity in Ukraine.

The highest productivity of cows is observed in the farms of Kyiv region - 6387.7 kg, Poltava region - 5641 kg, Cherkasy region - 5395.3 kg, Vinnytsia region - 5185.3 kg and Donetsk region - 5110.3 kg. The lower productivity of cows in the farms of the regions: Odesa - 3401 kg, Transcarpathian - 3616 kg, Dnipropetrovsk - 3832.7 kg, Kherson - 3941.3 kg and Volyn - 4001.3 kg.

Feed supply of the productive herd of cows in 2018 decreased compared to 2010. Consumption of all feeds per 1 quintal of milk decreased by 0.32 quintals and amounted to 0.86 quintals. k. units, concentrated - was spent 0.48 quintals. k. units.

According to the recommendations of the Ministry of Health of Ukraine, the rational annual consumption of milk and dairy products in terms of milk should be 380-395 kg. This negative trend is a matter of concern about meeting the needs of society with dairy products. In 2018, Odesa region took 5th place in the ranking of the least prosperous regions for milk production per capita (140.6 kg), and the first four places respectively took Donetsk region (44.6 kg), Lugansk region (58.8 kg), Dnipropetrovsk region (91.4 kg) and Kyiv region (92.1 kg).

The level of profitability has become widespread among the indicators that characterize the efficiency of production, and in particular, milk production. As can be seen from Fig. 4, this indicator is very low, because for 1 hryvnia of advanced capital for production received only 26.9 kopecks of profit (2018 - 16.1%).

The analysis of domestic dairy cattle breeding shows negative trends in the development of this industry during the study period. We have a reduction in the number of cows on farms.

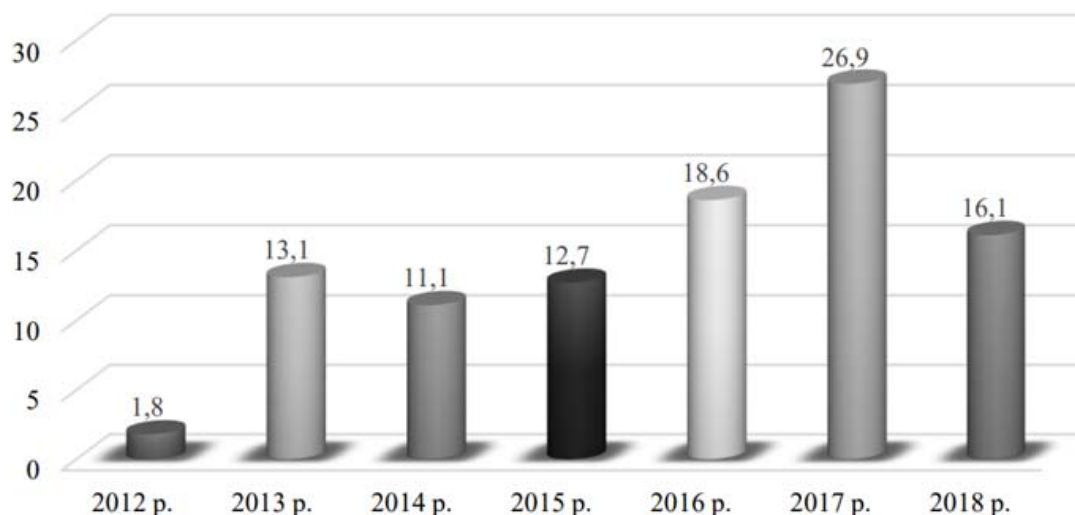


Figure 4 - The level of profitability of milk production

Source: summarized by the author based on [7]

The development of dairy farming in Ukraine is influenced by a number of factors, the main of which are: low purchase prices, difficulties with capital construction and modernization of farms and premises due to unfavorable credit policies of financial institutions for farmers, low level of integration of dairy production and processing, low concentration of livestock cows in enterprises, the use of traditional outdated in the production of raw materials and others.

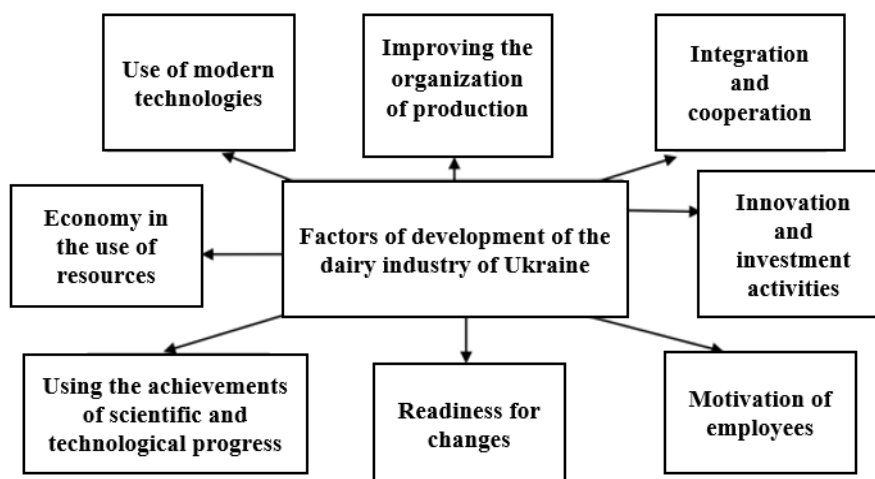


Figure 5 - Factors of the development of the dairy industry

Source: summarized by the author based on [7]

Conclusions and prospects for further researches. Therefore, in order to improve the situation in the industry, attention should be paid to increasing the level of intensification, which will increase the efficiency of the dairy industry. Further development of the industry should be considered systematically and comprehensively, and therefore it is necessary to pay attention to the factors of development of the dairy industry.

Thus, the dairy industry, both at the state level and worldwide, needs systematic further intensification and development. Reserves for improving the quality of milk, increasing production can be a system of measures to increase milk productivity of cows and reduce the cost of milk production. Leading measures in the future should be innovative approaches to the development of the industry, based on biotechnology, advanced animal feeding systems, modern technical and technological support, the use of IT technologies, breeding and energy and resource conservation. The prospect of further research is to build forecasts and compare them with the available results of food security in the country in the context of indicators of economic affordability of food security.

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Світові та вітчизняні тенденції розвитку виробництва продукції молочного скотарства

У сучасних умовах господарювання галузь молочного скотарства, з одного боку, належить до складних як в організаційному, так і в технологічному аспектах його складових, а з іншого, це галузь, яка залишається провідною в тваринництві. Дослідження полягає у розгляді сучасних тенденцій розвитку молочного виробництва, визначенні напрямків збільшення виробництва молока в господарствах та визначенні практично значимих рекомендацій стосовно можливих трансформаційних змін в господарствах.

Визначено, що молочна галузь набуває більшої вагомості у продовольчих системах більшості країн. Досліджено продуктивність корів за регіонами України та на міжнародному рівні в окремих країнах. Встановлено значення збільшення обсягів виробництва всіх видів продукції, особливо молока для розвитку тваринницької галузі, а молочної промисловості в агропродовольчому секторі для забезпечення населення повноцінними продуктами харчування. Зазначено проблеми, що перешкоджають розвитку галузі. Виділено ряд стримуючих чинників розвитку галузі молочного скотарства, а саме: низький рівень закупівельних цін, труднощі з капітальним будівництвом та модернізацією ферм і приміщень через невідповідність кредитної політики фінансових установ для аграріїв, низький рівень інтеграції виробництва та переробки молочної продукції, невисока концентрація поголів'я корів на підприємствах, використання традиційних застарілих технологій у виробництві сировини та інші.

Отже, галузь молочного скотарства як на рівні держави, так і на світовому потребує систематичної подальшої інтенсифікації та розвитку. Резервами щодо поліпшення якості молока, нарощування обсягів виробництва може бути система заходів щодо підвищення молочної продуктивності корів та зниження собівартості виробництва молока. Провідними заходами на перспективу мають бути інноваційні підходи до розвитку галузі, в основі яких технології, прогресивні системи годівлі тварин, сучасне техніко-технологічне забезпечення, використання ІТ-технологій, селекційно-племінна робота та енерго- і ресурсозбереження.

молочне скотарство, молочна галузь, виробництво молока, продуктивність, розвиток, резерви розвитку

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