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## PROSPECTS FOR THE DEVELOPMENT OF DAIRY FARMING OF DEKHKAN FARMS IN UZBEKISTAN

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## ПЕРСПЕКТИВЫ РАЗВИТИЯ МОЛОЧНОГО ЖИВОТНОВОДСТВА ДЕХКАНСКИХ ХОЗЯЙСТВ В УЗБЕКИСТАНЕ

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*Abstract.* The global temperature rise, which is increasingly noticeable on our planet today, the global financial and economic crisis in the background of the COVID-19 pandemic, the demographic situation in various countries has a significant impact on all sectors of the economy, especially agriculture. The full satisfaction of the population's needs for high-quality and cheap livestock products of local production depends mainly on measures for the development of dekhkan farms, which, in turn, requires the introduction of modern and innovative methods in this industry. The purpose of the study is to identify current problems in dekhkan dairy farms based on the analysis of statistical data for the period 2017–2021, as well as scientific research. Based on the results of the analysis, give practical proposals for the further development of dekhkan farms through the introduction of modern digital technologies. A digital mobile system created to provide services to dekhkan farms in the production of milk will be tested in dekhkan farms of the regions of the Republic of Uzbekistan and, on the recommendation of the relevant state organizations, put into practice.

*Аннотация.* Глобальное повышение температуры, которое сегодня все более заметно на нашей планете, глобальный финансово-экономический кризис в мировом сообществе на фоне пандемии COVID-19, демографическая ситуация в разных странах оказывает существенное влияние на все сектора экономики, особенно сельское хозяйство. Полное удовлетворение потребностей населения в качественных и дешевых продуктах животноводства местного производства зависит главным образом от мер развития дехканских хозяйств, что, в свою очередь, требует внедрения современных и инновационных методов в данной отрасли. Целью исследования является выявление текущих проблем в дехканских хозяйствах молочного производства на основе анализа статистических данных за период 2017–2021 годов, а также научных исследований. Основываясь на результатах анализа, даны практические предложения по дальнейшему развитию дехканских хозяйств посредством внедрения современных цифровых технологий. Цифровая мобильная система, созданная с целью оказания услуг дехканским хозяйствам в производстве молока, будет апробирована в дехканских хозяйствах

областей Республики Узбекистан и по рекомендации соответствующих государственных организаций внедрена на практике.

*Keywords:* economy, cow, milk, productivity, statistics, development, mobile application, digitalization.

*Ключевые слова:* хозяйство, корова, молоко, продуктивность, статистика, развитие, мобильное приложение, цифровизация.

### *Introduction*

Today, as a result of economic reforms in the livestock sector of the Republic, the development of economic entities of various forms of ownership has led to the transfer of the livestock sector to farmers. In particular, the share of farms in milk production is very large, and it can be seen that the dairy cattle industry is developing mainly at the expense of a small private sector.

To date, more than 93.8% of the total milk produced in the country is accounted for by farms. Therefore, the factors influencing the improvement of economic performance of dairy cattle should be aimed primarily at ensuring the efficiency of production on farms.

It also provides consulting services on the level of technical equipment of dairy production on farms, measures to improve the breeding of cattle, easy access to resources for the livestock sector at competitive prices, processing and sale of dairy products and information on market conditions. there are some problems that farmers face in developing the activities of the entities.

In this regard, the need to create a digital mobile service system for dairy farms is becoming increasingly important. Finding practical solutions to these problems will help to form effective systems in the cultivation of quality products on farms based on modern technologies.

### *Literature and review*

The methodological and theoretical basis of the study is the scientific works of domestic and foreign economists on the problems of dekhkan farms of dairy production, adopted regulatory legal acts, as well as data from official websites. The initial information for the analysis of livestock, milk production, livestock productivity was the statistical and reporting materials of the State Committee of the Republic of Uzbekistan on Statistics.

Abstract-logical, economic-statistical, graphical and other research methods were used in solving the set tasks.

### *Results*

According to the analysis, the livestock sector accounts for about half of the country's agricultural production. In 2017, the share of the livestock sector in the value of agricultural products was 43.8%, but in recent years this figure has grown several times. By 2021, the share of the livestock sector in the country's agricultural production will be 50.1%. From the above analytical figures, we can see that the overall growth rates in the livestock sector are high. Because the number of livestock is growing rapidly in the country.

According to the data obtained from the State Statistics Committee of the Republic of Uzbekistan, by the end of 2017 in all categories of farms 12471.0 thousand head of cattle, including 4336.5 thousand head of cows, 20640.9 thousand head of sheep and goats, 230.6 thousand head of horses and While 74870.1 thousand head of poultry were reared, we can see a steady increase in recent years as well (Table 1) [2, 3, 5].

In particular, the dynamics of changes in the number of cattle in 2021 compared to 2017 increased the number of cattle by 8.7%, cows by 12.2%, sheep and goats by 11.8%, horses by 13.1%

and poultry by 19.9%. If we look at the growth trend in the number of livestock in the country over the past five years, the growth has been consistent for all types of livestock.

At the same time, the dynamic change has drastic differences within different forms of management. In particular, the number of livestock has decreased at agricultural enterprises, while it has grown at a relatively low rate on farms. In 2021, the number of livestock on farms will grow steadily, and 92.0% of the total number of cattle, including 91.9% of cows, are currently being raised on farms.

Table 1

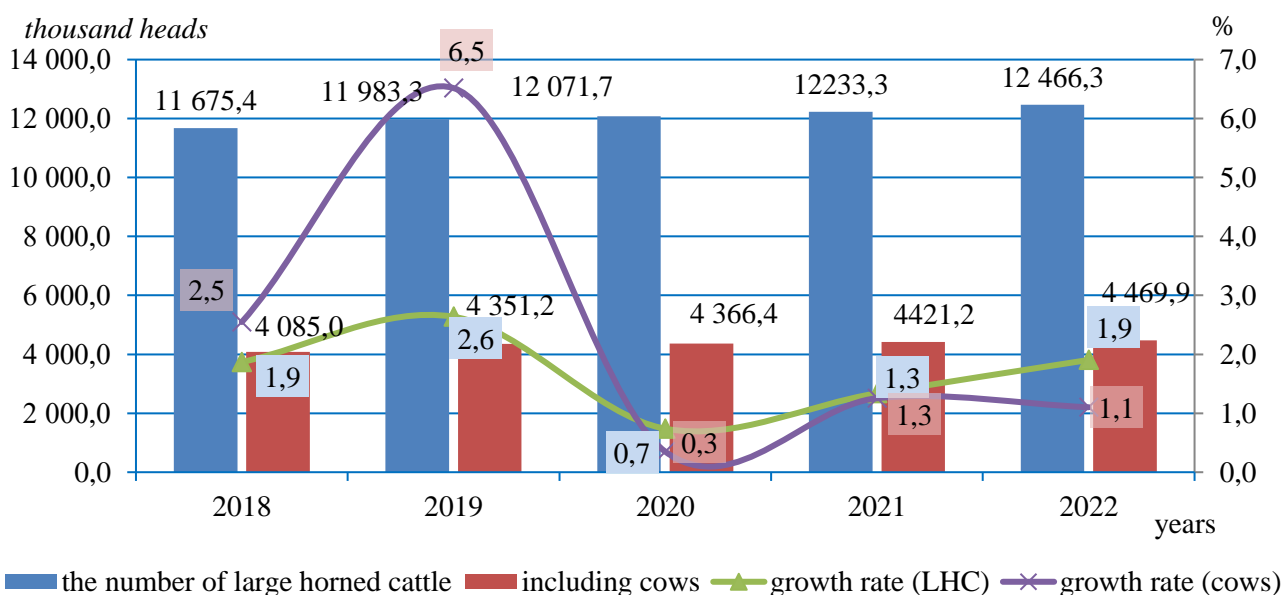
CHANGE IN THE NUMBER OF LIVESTOCK IN ALL CATEGORIES OF FARMS IN THE COUNTRY (IN THOUSANDS)

Observed years	Large horned cattle		Sheep and goats	Horses	Poultry
	total	including cows			
2017	12471.0	4336.5	20640.9	230.6	74870.1
2018	12814.1	4626.0	21580.5	242.5	86374.8
2019	12949.7	4663.5	21906.9	247.1	87859.7
2020	13188.7	4744.3	22498.6	254.0	89589.7
2021	13555.8	4866.1	23074.3	260.7	89734.4
In 2021 compared to 2017, (%)	108.7	112.2	111.8	113.1	119.9

Source: information of State Statistics Committee of the Republic of Uzbekistan 2017-2021

In 2017, 93.6% of the total number of cattle was raised on farms, 4.9% on farms and 1.5% on agricultural enterprises, and by 2021 the share of cattle on farms will be 92.0% and the share increased to 6.5 percent. It should be noted that the number of cattle on farms has been growing steadily, from 11,675.4 thousand to 12,466.3 thousand in 2017-2021, with a growth rate of 104.8%.

In addition, in 2021, 91.9% of the total number of cows in the country will belong to dekhkan farms, 6.8% to farms, and 1.3% to other agricultural enterprises. In particular, the dynamics of the number of cows on farms in 2021 compared to 2017, the number of cows increased by 8.2% and amounted to 4469.9 thousand heads (Figure 1) [2, 3, 5].



Source: information of State Statistics Committee of the Republic of Uzbekistan 2017-2021

Figure 1. Information on the number of livestock on farms (on January 1)

Due to the low level of breeding of cattle in the farms of the country, it is necessary to work to increase the pedigree of livestock at the disposal of farms. This requires the improvement of livestock breeds and the establishment of farms that produce pedigree cattle, with state support. In order to improve the breeding of livestock, it is advisable to organize selection and breeding services in a way that can be used in the activities of farms and dekhkan farms, as well as in remote rural areas. These measures will create favorable conditions for the sustainable development of the livestock sector.

According to the analysis of the current state of changes in the productivity of dairy production and milk production in the country, the level of milk yield is one of the main indicators determining the economic efficiency of production in the industry and, consequently, the competitiveness of production. When analyzing the milk yield of cows, it is also necessary to pay attention to the composition of the production within the forms of management.

Because it is the basis for making great clarifications on this issue and drawing scientific conclusions that are close to the truth. When analyzing the ratio of milk production in the country by forms of management, the share of agricultural enterprises in 2017 was 0.7%, and by 2021 - 1.0%. As the share of farms increased from 3.4% to 5.2%, the share of dekhkan farms has decreased from 95.9% to 93.8% in recent years (Table 2) [2, 3, 5].

Table 2

COMPOSITION OF MILK PRODUCTION BY ECONOMIC CATEGORIES  
 (on January 1, as a percentage of all categories of farms)

<i>Economic categories</i>	2018	2019	2020	2021	2022	<i>In 2021 compared to 2017,+/-</i>
All categories of farms	100.0	100.0	100.0	100.0	100.0	
including:						
Farms	3.4	3.8	4.3	4.8	5.2	+1.8
Dekhkan farms	95.9	95.5	94.8	94.3	93.8	-2.1
Agricultural enterprises	0.7	0.7	0.9	0.9	1.0	+0.3

Source: information of State Statistics Committee of the Republic of Uzbekistan 2017-2021

In 2021 the highest share in the total volume of milk production fell to Samarkand region (11.8%), as well as Kashkadarya (11.1%), Khorezm (9.5%), Fergana (9.5%), Bukhara (9.0%). %, Andijan (8.8%) and Tashkent (8.6%) regions.

The lowest share in the total volume of milk production was observed in the Syrdarya region (3.3%) and the Republic of Karakalpakstan (3.7%).

The highest growth rates compared to 2017 were recorded in Syrdarya (16.9%), Fergana regions (16.2%), the Republic of Karakalpakstan (15.2%), as well as Jizzakh (14.8%) and Kashkadarya (14.6%) regions. was found.

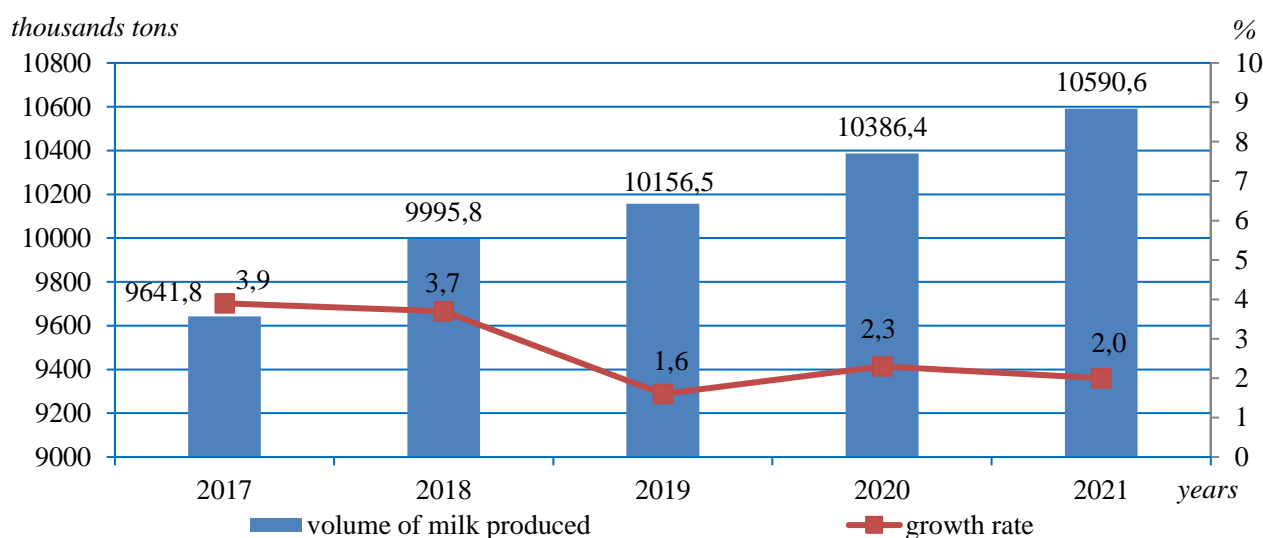
In addition, the volume of milk produced on farms in 2021 increased by 10% compared to 2017 and amounted to 10,590.6 thousand tons (Figure 2) [2, 3, 5].

Increasing milk production should be done at the expense of productivity, not by increasing the number of cows. Because at a time when the number of cows in the country is growing rapidly, the average milk yield today remains very low.

Although the milk productivity of cows is growing in comparison with previous years in all types of farming in the country, but not as desired. In particular, in 2016, the milk yield of cows in agricultural enterprises was 1,700 kilograms, in farms — 1,680 kilograms, and in farms — 2,300 kilograms. This productivity figure may not even cover the cost of milk production (if the feed is fully commercialized).

Among the forms of management engaged in the production of livestock products, dekhkan farms are achieving significantly higher results in terms of cow productivity. In particular, during 2017-2021, the milk yield of cows on farms across the country is expected to grow steadily. However, the milk production of cows is not at a level that allows them to get the amount of profit needed for the sustainable development of the livestock sector.

The fact that the main dairy producers in the country are farms creates a number of statistical inaccuracies in the accounting of milk production of cows. At the same time, with the increase in the number of cows (by 11%) and the absolute increase in milk production (by 12%), the supply of fodder to cattle, the area of possible fodder crops has remained almost unchanged (44.3 in 2016). thousand hectares, in 2020 it was 43.6 thousand hectares). Here the ratio imbalance between the change in production capacity and the change in the quantities of product created is obvious.



Source: information of State Statistics Committee of the Republic of Uzbekistan 2017-2021

Figure 2. Information on the volume and growth rate of milk production on farms

It is possible to observe a mismatch between the amount of forage areas that are the fodder base and the amount of livestock products grown. Therefore, it can be concluded that it is necessary to improve the statistical methods of accounting for the potential of farms. In particular, statistics on cow milk production also require accuracy.

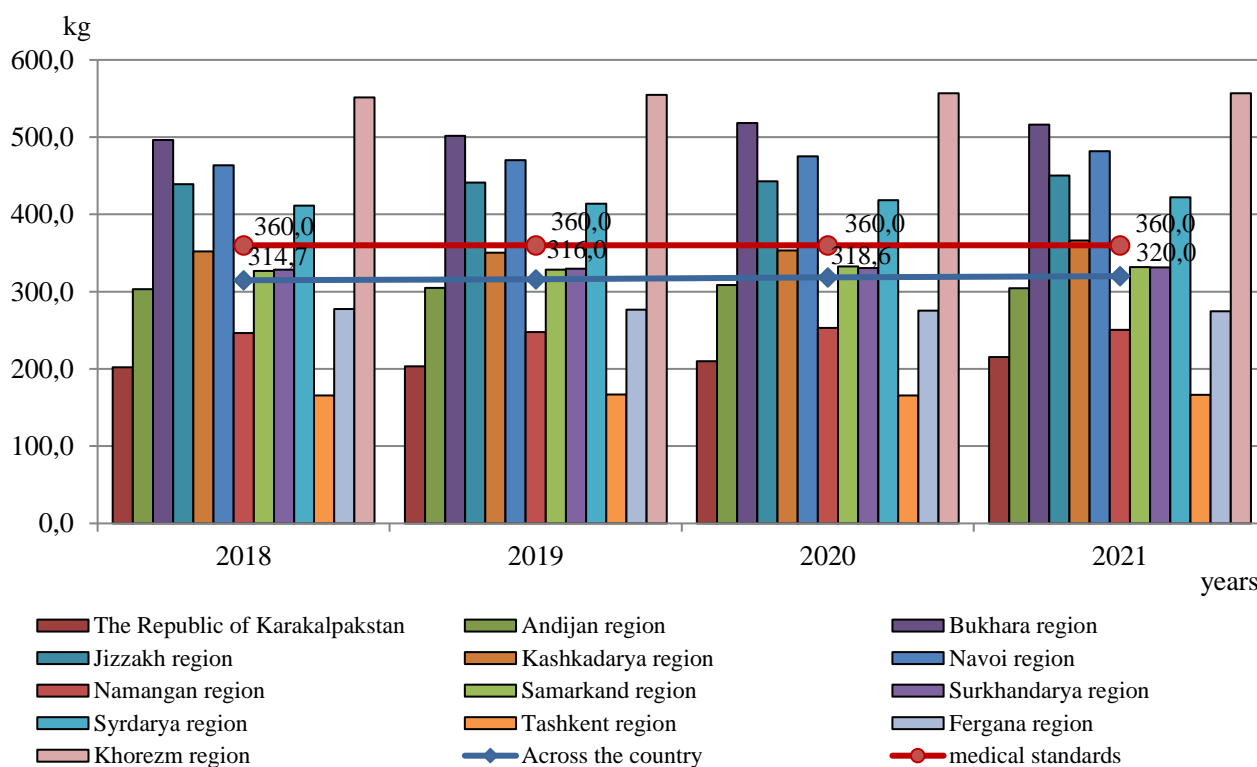
The full satisfaction of the needs of the population in milk and dairy products is directly related to the development of farms. This, in turn, requires increasing the productivity of each conditional livestock and per 100 hectares of agricultural land by increasing livestock productivity, creating a solid fodder base, improving the quality of services to the livestock sector and expanding the production of finished products.

If we pay attention to the analysis of indicators of milk production per capita in the country, we can observe the dynamics of growth in these indicators. Compared to the volume of milk production per capita and medical physiological norms shown in Figure 3, the volume of milk production per capita is relatively less. According to the analysis, there is a shortage of milk per capita (the physiological norm for milk and dairy products should be a total of 360 kilograms per capita).

In terms of regions, the lowest per capita milk production and medical physiological norms are in Tashkent region — 166.5 kg, and in Andijan, Namangan and Fergana regions — 215.2, 250.7 and 274.8 kg, respectively.

According to the analysis of data, in the provision of the population with milk and dairy products, the uncovered part is imported at the expense of domestic production. The main exporters of dairy products to our country are Germany, the Netherlands, Ireland, Canada, Belgium, Lithuania, Latvia and Australia. Dairy products from these countries are mainly imported to the country in a limited range. In particular, condensed milk is imported from Latvia, butter and condensed milk from the Netherlands, and only butter from Ireland, Canada, Australia, Belgium and the Czech Republic. In 2020 alone, 25.3 thousand tons of milk and dairy products were imported. Compared to 2017, imports of dairy products increased by 2.6 times and amounted to 34,156,000 US dollars formed (<https://www.trademap.org>).

According to the data of the State Statistics Committee of the Republic of Uzbekistan on the volume of milk and dairy products per capita in 2017-2021, the low milk yield of cows in the country is due to insufficient feed supply. In particular, if we compare the average milk yield of cows in the country with the indicators of developed countries and neighboring countries, where the technology of production does not differ significantly from our technology, we can observe a much lower productivity (Table 3).



Source: information of State Statistics Committee of the Republic of Uzbekistan 2018-2021.

Figure 3. The dynamics of growth in the volume of milk produced per capita over the years by region

Table 3  
 AVERAGE MILK YIELD PER COW IN COUNTRIES WITH DIFFERENT TECHNOLOGIES (2015)  
 (<http://faostat.fao.org>)

Countries with advanced technology of milk production	Milk productivity of cows, (kg)	Countries with close milk production technology	Milk productivity of cows, (kg)
United States	9118	Armenia	1965
Hungary	6026	Belarus	3639
Germany	6637	Latvia	4661

<i>Countries with advanced technology of milk production</i>	<i>Milk productivity of cows, (kg)</i>	<i>Countries with close milk production technology</i>	<i>Milk productivity of cows, (kg)</i>
Holland	7011	Russia	4270
Denmark	8131	Tajikistan	1769
South Korea	9616	Turkmenistan	2992
Israel	11200	Ukraine	3558
Canada	7595	Estonia	5920
Finland	7570	Uzbekistan	2300
Czech Republic	6415	Kyrgyzstan	2150
Sweden	8152	Kazakhstan	2345

Low milk production of cows in the country means inefficient use of available resources in the agricultural sector. In particular, much of the available fodder potential is spent on maintaining the physiological condition of cows, not on the formation of product (milk). This is because in conditions where it is not possible to change the amount of fodder, a large number of cows are cared for and low yields are produced.

Not only does the breeding performance of cows not meet the demand, but also the low availability of fodder in sufficient quantities, quality and proportions is a major factor.

However, over the years of independence, the increase in the number of cows in the private sector and the steady growth of milk production, the experience of developing the livestock sector are the result of practical measures taken by the state to support the sector.

#### *Discussion*

The analysis shows that problems in the sale of dairy products, difficulties in attracting investment in the processing of dairy products in rural areas, the introduction of waste-free technologies, problems in the field of breeding and selection are serious obstacles to the development of dairy farming.

Significant loss of raw materials and finished products is due to technical and technological, organizational and economic imbalances in the processing and storage systems. Due to the lack of packaging equipment and the lack of attention to their production in the country as part of localization programs, the production of non-fat dairy products or their delivery to consumers as milk powder does not meet the requirements.

Therefore, in the effective operation of livestock farms, it is extremely important to organize high-quality services that will lead to an increase in milk productivity. This requires strengthening the material and technical base of all types of service enterprises. Because most of the service enterprises operating in the country provide services on the basis of old equipment, machinery and devices, which leads to a decrease in the quality of services provided.

One of the main issues in the establishment of service enterprises providing services to dairy farms and dekhkan farms is determined by the proximity and convenience of service enterprises to consumers. That is, the user of the service must be located in accordance with the requirements of business entities. Under these conditions, service costs are saved, cheap and timely quality service is provided.

The solution of the following problems in the service system of the livestock sector will lead to an increase in the quality of service [6]:

- Weakness and lack of material and technical base of service entities, and the existing ones are located in district centers;

- Inadequate composition, quality and range of veterinary services provided to farmers and farms, lack of highly qualified specialists;

- Lack of conditions for the functioning of the banking system for livestock in the interests of dairy farmers (lack of organization of dairy farmers, lack of legal entity status in most farms, low creditworthiness).

In order to increase the productivity of milk and dairy products, it is necessary to take the following measures:

1) Optimizing the processes of growing, collecting, storing and using food wisely.

2) Improving the technology of growing fodder crops, increasing their productivity and quality, taking into account the cultivation of fodder in a scientifically based crop rotation system. This improves the quality of the feed. For example, natural organic grown by hydroponics nutrients. If the digestibility of 1 kg of grain is 40%, if 8-10 kg of green grass is grown from 1 kg of grain and fodder is prepared, the digestibility will reach 95%, feed will be saved, disease resistance of livestock will increase, milk yield of dairy cows will increase by 15-20% is achieved [4].

3) Revise the ration based on the type and direction of livestock products. The ration should ensure that it is balanced with coarse, watery and concentrated feed. Often proper nutrition is enough to increase productivity. For example, growing fodder yeast using hydrolyzed straw or other coarse feed into sugar. When 21-22 kg of milk is fed to dairy cows from hydrolyzed feeds, its obesity rate increases by 105% and milk yield by 18-20% [4].

4) Adherence to dairy farming technology. Sometimes cows are milked for a long time. Veterinarians observed cows during lactation of 430 and even 470 days. On the other hand, sometimes the dry period is prolonged. This reduces the productivity of the cows. It is necessary to strictly follow the cycle "dry period-pregnancy-calving-lactation", to meet the deadlines.

5) Raise awareness of products, services and professionals in the field. Effective feed supplements, veterinary drugs and the services of qualified veterinarians can increase the efficiency of dairy farming.

6) Microclimate. It is important for animals to avoid exposure to very high temperatures, significant temperature changes, moisture and other factors that impair body function and harm the health of cows.

7) Prevention of parasitic and infectious diseases. Healthy cows are always more productive.

8) Artificial insemination, breeding and rearing of young animals. Improving the breed, proper rearing of young cows is one of the ways to increase productivity.

### *Conclusion*

Based on the above analysis, it can be noted that dekhkan farms are the main producers of milk. Along with the positive dynamics of growth in the number of cattle, including cows, an increase in milk production, the productivity of cows remains low. The main reasons for the decline in productivity in dekhkan farms are limited land, poor material and technical base, the orientation of rural residents to traditional production technologies, as well as an underdeveloped service system. In addition, dekhkan farms are not sufficiently cooperative in the production, processing and marketing of milk.

The creation of a mobile application for the provision of services to dekhkan farms of dairy production will allow you to quickly receive information: about the situation in the dairy products market, the formation and changes in prices for products; the cost of services for artificial insemination of cattle, on the conditions of service, veterinary services, veterinary drugs, livestock



vaccination; new technical means, technologies, possibilities of their acquisition, prices, terms of delivery.

A database will also be formed on the sources, quantity and cost of fodder, mixed fodder for dekhkan farms of dairy production, and a diet for livestock in stalls will be developed.

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