# Increasing efficiency of livestock farming in Uzbekistan

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**Abstract.** Efficient use of available resources like land, water, and feed is crucial for sustaining operations. This means managing resources throughout the year, ensuring their effective use. Timely completion of tasks and high-quality work are key to maximizing productivity and minimizing losses. Introducing and maintaining productive livestock breeds is also crucial for economic stability. These breeds are selected for their ability to thrive in local conditions and provide optimal yields. By investing in productive breeds, farmers can improve overall efficiency and profitability. Reducing price gaps between inputs used in livestock farming and market prices of agricultural products is important. This can be achieved through negotiation and strategic planning. Increasing mechanization and automation can help reduce labor costs and improve efficiency. Implementing cost-saving techniques and innovative technologies is vital for long-term economic stability. These include methods to improve feed efficiency, waste management, and disease control. By adopting these practices, farmers can reduce costs and improve profitability. Ensuring high-quality and efficient veterinary care is critical for maintaining livestock health. This includes regular health checks, vaccinations, and disease prevention. By investing in veterinary care, farmers can reduce the risk of disease outbreaks and ensure long-term sustainability.

## 1. Introduction

Currently, as market relations are developing, one of the most pressing issues facing our nation is providing the people of Uzbekistan with inexpensive, high-quality, and environmentally friendly livestock farming products. This task needs to be solved and implemented on a scientific basis.

In Uzbekistan, addressing the population's demand for livestock products such as meat, milk, eggs, and fish is a top priority [1]. This entails ensuring a consistent and sufficient supply of these products in local markets to meet the needs of consumers. Livestock farming plays a crucial role in providing these essential food items, and efforts are being made to enhance production and distribution systems to achieve this goal [2].

To meet the population's needs, it's essential to focus on improving livestock breeding practices, enhancing animal health and welfare, and increasing the efficiency of production processes. This includes implementing modern technologies and management practices to boost productivity and quality while minimizing resource use and environmental impact [3, 4].

Ensuring the availability of livestock products in markets requires a well-developed infrastructure for transportation, storage, and distribution [5]. This involves improving market access for farmers, establishing effective supply chains, and addressing logistical challenges to ensure a steady flow of products to consumers [6].

Livestock farming plays a crucial role in Uzbekistan's agriculture, contributing significantly to labor distribution in the country. By considering the natural and economic conditions of different regions and market demands, it is possible to strategically deploy livestock farming networks, including sheep farming, fishing, beekeeping, and antra breeding, to meet the needs of food and processing industries. These industries produce essential products such as meat, milk, wool, leather, and honey.

The development of these sectors not only supports industrial growth but also provides protein-rich products vital for human health. Additionally, livestock waste, such as manure, serves as organic fertilizer, enhancing soil fertility and supporting plant cultivation. Milk, a key product of livestock farming, is not only consumed by humans but also serves as vital nourishment for newborn animals.

The Uzbekistani government has responded by implementing extensive programs, laws, decisions, and regulatory

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documents aimed at the advancement of livestock farming. However, despite these efforts, the production and consumption of meat and milk per capita in Uzbekistan fall short of medical standards, failing to meet the necessary requirements for the human body. Various measures are being implemented to achieve these goals and enhance the livestock industry in the country.

## 2. Materials and Methods

Livestock farming encompasses various branches, including cattle farming, sheep farming, poultry farming, horse breeding, fishing, and beekeeping. The key objectives for developing these industries include establishing a reliable feed base, ensuring a consistent supply of diverse, vitamin-rich, protein-packed, and nutritious feeds for livestock year-round, organizing breeding and selection efforts effectively, and incorporating advanced scientific knowledge and practices. The wide adoption and effective utilization of modern technologies are also crucial for the industry's advancement.

The quantity of cattle and poultry in Uzbekistan is shown in Table 1 for all economic categories.

**Table 1.** Number of large horned livestock in Uzbekistan by all economic categories, ‘000 head

| Indicators | 2019 | 2020 | 2021 | 2022 | 2022 compared to 2019, % |
|---|---|---|---|---|---|
| Dairy livestock | 12397.1 | 12792.5 | 12891.9 | 13213.2 | 106.8 |
| including: | | | | | |
| Farms | 620.0 | 645.7 | 711.4 | 791.5 | 125.9 |
| Dekhkan farms | 11571.5 | 11899.5 | 12104.6 | | |
| Other organizations performing agricultural activities | 174.6 | 189.3 | 181.9 | 234.7 | 191.3 |

From the table, it is evident that between 2019 and 2022, there was a substantial increase in the number of livestock in Uzbekistan, amounting to a 105% rise. Table 2 illustrates the dynamic growth of livestock numbers on farms in Uzbekistan from 2019 to 2022.

**Table 2.** Number of livestock on farms in Uzbekistan in 2019-2022, ‘000 head

| Regions | Years | | | | | |
|---|---|---|---|---|---|---|
| | 2019 | 2020 | 2021 | 2022 | 2022 compared to 2019, % | |
| | | | | | +,- | % |
| Karakalpakstan | 27.0 | 70.0 | 66.2 | 62.0 | 16.1 | 145 |
| Andijan | 25.7 | 26.6 | 64.4 | 66.2 | 14.5 | 145 |
| Bukhoro | 67.7 | 60.7 | 72.9 | 14.4 | 10.9 | 119 |
| Jizzakh | 35.2 | 36.9 | 41.7 | 41.9 | 10.5 | 156 |
| Kashkadarya | 65.5 | 67.2 | 74.4 | 14.0 | 11.9 | 146 |
| Navoi | 32.6 | 36.3 | 44.2 | 49.6 | | 161 |
| Namangan | 35.7 | 35.0 | 22.4 | 41.1 | 10.4 | 190 |
| Samarkand | 67.7 | 76.3 | 77.2 | 14.7 | 16.1 | 149 |
| Surkhondarya | 27.7 | 23.9 | 46.2 | 62.6 | 6.9 | 115 |
| Sirdarya | 33.6 | 35.6 | 24.4 | 24.1 | 1.5 | 100 |
| Tashkent | 70.7 | 79.3 | 76.6 | 79.7 | 9 | 114 |
| Ferghana | 26.7 | 75.0 | 66.6 | 67.7 | 11.1 | 146 |
| Khorezm | 60.3 | 79.2 | 61.7 | 64.9 | 4.0 | 109 |
| Total | 657.9 | 663.3 | 701.4 | 714.6 | 169.6 | 110 |

According to the table, the total number of livestock in Uzbekistan was 615,900 heads in 2019 and increased to 784,500 heads in 2022. This represents a 27% increase in livestock numbers in 2022 compared to 2019. The annual growth in livestock numbers in Uzbekistan is meeting the demand for meat and dairy products among the population and providing raw materials for the industry.

To ensure a high yield of nutritious crops, it is recommended to achieve 6-7 tons of feed units per hectare from main crops, 4-5 tons from intermediate crops, and 3-4 tons from repeat crops, totaling 8-10 tons of feed units. To increase food crop productivity, the use of high-yielding varieties and hybrids, as well as advanced technologies, is advised.

It is crucial to increase the availability of elite, first-generation reproduction, and hybrid seeds for food and intermediate crops. Strengthening primary seed production at originators (scientific research institutes) and enhancing the material and technical capabilities of regional farms specializing in seed production for nutritious crops in all regions are essential steps in this regard (Table 3).

**Table 3.** List of the requirements and availability of coarse and juicy feed for farms that specialize in breeding livestock, '000 tons

| Feed | Demand | Actual | % |
|---|---|---|---|
| Hay | 515 | 350.9 | 68 |
| Straw | 487 | 1491.2 | 306 |
| Senage | 695 | 389.5 | 56 |
| Silage | 949 | 580.9 | 64 |
| Nutritious beet | 228.0 | 0.3 | 0.15 |
| Green mass | 3937.2 | 1594.5 | 47 |
| Total feed ('000 tons) | 6607.2 | 4491 | 67 |
| Conditional feed for 1 head of cattle | 1507.0 | 1011.4 | 67 |
| (quintals) | 21.7 | 14.5 | 67 |

The increase in livestock numbers in Uzbekistan is primarily due to the importation of cattle from abroad to meet the population's demand for food products from the livestock farming sector. Livestock farming contributes significantly to the country's gross agricultural product, accounting for about 46-47% of the total. Approximately 90% of this output comes from household production. There is currently a strong focus on producing environmentally friendly products in the livestock farming sector, necessitating the preservation, storage, and care of livestock at a high level to create "comfortable" conditions for them.

In Uzbekistan, there is an urgent need to properly organize the production and distribution of concentrate feed. Farms in the nation produce 90% of the meat and milk consumed. It is imperative to create fodder sales branches in areas where feed-producing companies are present in order to enhance the supply of concentrate feed to these farms. Additionally, these branches must optimize payment mechanisms.

Studies have indicated that feeding techniques account for almost 60% of the increase in milk output in cows. As a result, the anticipated yearly feed consumption is thirty to thirty-five cents per head of livestock, forty-five to fifty cents for breeding cattle, and sixty to sixty cents for imported cattle breeds.

## 3. Results and Discussion

One of the key factors driving the increase in livestock farming products in Uzbekistan is the widespread adoption of modern advanced technologies by individual farmers and farms. The introduction of these technologies, along with scientific advancements, is crucial for the comprehensive development of livestock farming, increasing equipment utilization, and enhancing the quality of human capital.

There is a concentrated push to build small processing businesses with cutting-edge, high-performance equipment, especially in rural regions, in order to meet the population's food demands in a sustainable manner and supply the home market with locally produced items. Through the use of small-scale technology and portable equipment, this program seeks to create new businesses throughout Uzbekistan that will process meat and dairy products and provide raw milk preparation services. This strategy not only creates job opportunities but also boosts income and well-being for many individuals.

Significant progress has been made in processing meat and dairy products on an industrial scale, with production carried out exclusively by business entities organized as legal entities. Artificial breeding using productive bull semen has proven to increase milk production by 30%. Furthermore, calves raised through artificial breeding can achieve a live weight of 410–450 kg at 15–16 months of age if they are fed intensively starting at 7-8 months of age, which results in a 30% increase in meat production. By using cutting-edge technologies, feed companies can save labor and energy expenses by as much as 30%, which lowers the cost of fodder.

**Table 4.** Recommended rate of daily use of carbon mineral nutrient supplements for livestock

| Indicators | 1 head of cattle in 1 day (grams) |
|---|---|
| For large horned livestock | 300-6000 |
| Calves from 1 to 6 months | 70-140 |
| Calves from 7 to 12 months | 160-280 |

Affordable, high-quality feed enhances the purchasing power of economic entities and boosts livestock productivity, reducing heifer calving intervals and pre-parturition body costs. Investing in a single service sector in livestock farming has a ripple effect on overall industry development.

Innovations in the livestock agricultural product processing sector allow for the creation of high-quality exportable items, lower energy and labor costs when using manual labor, boost export earnings, enhance productivity, and give suppliers and employees financial incentives. This positive environment stimulates growth and development across the sector.

Innovative technologies play a significant role in livestock development on farms, including the use of carbon mineral

feed supplements like "Felutsen." Table 5 illustrates the impact of the carbon mineral feed additive "Felutsen" on animal live weight.

**Table 5**. Effect of carbon mineral feed additive "Felutsene" on livestock live weight

| Period | Groups | | | |
|---|---|---|---|---|
| | Control | | Experimental | |
| | X+ Sx | CV, % | X+ Sx | CV, % |
| Pre-experiment | 335.0 ± 5.1 | 3.9 | 340.3 ± 4.0 | 3.6 |
| First month | 358.0 ± 4.4 | 4.34 | 366.2 ± 3.8 | 3.6 |
| Second month | 384.0 ± 4.8 | 4.0 | 398.4±3.7 | 3.4 |
| Third month | 414.3±4.2 | 3.9 | 431.8 ±4.6 | 3.6 |
| Change in livestock liveweight | 80.3 | | 95.8 | |

Cattle on the farm showed extra growth of 80.3 kg when fed a regular feed ration and 95.8 kg when fed feed supplemented with UMO. This shows that both product production and production expenses can be greatly reduced and increased through comprehensive inventive development in cattle farming. An investigation of the performance of cattle fed carbon mineral feed additives is shown in Table 6.

**Table 6.** Efficiency of livestock fed with carbon mineral feed additives (per head of livestock)

| Indicators | In a normal feed ration | Feed with added UMO additives | Differences (+; -) |
|---|---|---|---|
| Additional growth (kg) | 81.7 | 94.4 | 14.8 |
| Value of sold products (UZS) | 512841 | 611011 | 97269 |
| Cost (UZS) | 429499 | 596539 | 66131 |
| Profit (UZS) | 82461 | 105399 | 30201 |
| Rate of productivity (%) | 18 | 24 | |

The yield rate of cattle fed a normal feed ration was 19%, compared to 23% when supplemented with UMO, representing a percent increase in yield rate with UMO supplementation. This demonstrates that innovative technologies can increase livestock efficiency, farm profitability, reduce costs, and enhance synergistic efficiency.
To reduce production costs and achieve high efficiency in livestock farming, the following strategies should be implemented:

- Complex mechanization to increase labor productivity.
- Consistent intensification to enhance livestock productivity.
- Improved use of working capital to minimize feed consumption per unit of product.
- Enhancement of product quality and organization of goods production.
- Network centralization, appropriate specialization, and deployment structure.
- Consistent use of cutting-edge scientific findings and best practices.
- The field's commercialization and the improvement of manufacturers' cooperating ties.
- Cutting back on labor and material expenditures, as well as on wasteful spending on research and administrative administration.

Livestock development is a primary objective in agriculture. To achieve this, the following comprehensive measures have been devised:

- Establishing a robust fodder base and rational fodder use in livestock farming.
- Increasing the livestock population of all breeds.
- Improving breeding practices to enhance herd productivity and adapt cattle to industrial feeding techniques.
- Enhancing veterinary and artificial breeding services through service point expansion.
- Organizing auctions for breeding stock sales to individuals, farmers, and farms.
- Expanding micro-credit opportunities for smallholders and agricultural enterprises to facilitate livestock purchases.
- Developing new livestock breeds and improving existing ones, alongside advancing theoretical and practical

livestock farming management methods. This includes drawing on the experience of pioneers in zootechnics and livestock farming to introduce rational breeding and feeding methods.

## 4. Conclusions

To ensure economic stability in livestock farming, it is essential to strive for rational and appropriate spending of resources, including material, monetary, and labor costs. This approach helps reduce the cost of the products grown. Implementing productive livestock breeds, decreasing the price gap between agricultural products and industrial enterprises, increasing the degree of mechanization and automation of production processes, lowering the consumption of live labor through the introduction of new cost-saving techniques, and cutting back on the use of labor are all important strategies. As is efficiently utilizing all means of production available in the livestock farming network throughout the year. It is also important to carry out zooveterinary activities qualitatively and efficiently. This includes maintaining animal health, preventing and controlling diseases, and ensuring proper care and nutrition to maximize productivity and economic returns.

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