

# **Analysis of target markets**

## **Project „BreedExpo2“**

### **Animal husbandry and breeding industries in Uzbekistan, Azerbaijan and Turkey**

**Interreg**



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**BreedExpo2**

**2024**

# 1. Summary

In BreedExpo2 projekt, the markets for export development are Uzbekistan, Azerbaijan and Turkey. Two of them, Azerbaijan and Uzbekistan, have shown to have several similarities - half of their population is living in rural areas; livestock numbers are steadily increasing constituting 40-50% of total agricultural output; animal husbandry enterprises are generally small-scale family businesses with average herd size of just 1-20 and land size below 1-2 ha. Both states are still lacking self sufficiency in milk/meat and since their need for food will increase due to growing population and rise in people income, they try to strengthen the agriculture sector by building modern livestock farms (agro-parks) in Azerbaijan and creating demofarms and establishing private farm clusters based on contract farming in Uzbekistan.

Turkey's rural population on the other hand is in decline, being currently around 17%. Their self-sufficiency level in milk is already 117% and farming practices are on a higher level. The uniqueness of the country is how agricultural economy is regulated by f.ex. fixing milk price, issuing government-guaranteed price at slaughter for imported feeder cattle, not allowing imports from all EU-approved countries .

During first contact visits to farms and exhibitions, BreedExpo2 project partners have clarified the strengths and weaknesses of each of these countries which is supported by the following market insight.

**Uzbekistan:** main problem of the state is low productivity of the livestock sector. Despite high animal numbers, there is increasing shortage of high-quality dairy products on the market. According to the President's Resolution future attention is given to improvement of private and public veterinary services, enhancement of animal feed marketing to increase feed supply, creating elite or demonstration farms with high quality pedigree animals for reproduction, boosting animal productivity by carrying out national livestock breeding programmes, and by importing high quality stock of pedigree animals.

**Azerbaijan:** as a result of implementation of various government's strategies to improve living standards of rural people, the country has shown steady growth of agricultural and food production. Subsidies for purchase of purebred cattle, use of artificial insemination and establishment of modern livestock farms - agro-parks, makes Azerbaijan a favourable country for dairy cattle export. Considering beef cattle, there is a demand for fresh veal in the market, but little demand for beef or bull meat. In Azerbaijan, cattle are slaughtered at about half the average weight compared to the world average. Local processors buy old beef at a relatively low price.

**Turkey:** compared to other target markets in BreedExpo 2 project, the level of Turkish dairy farms was higher both in terms of animal welfare and feeding quality. Turkey is currently mostly suitable for dairy cattle and frozen semen export since: a) ~90% of local dairy farmers use artificial insemination; b) local need to rebuild livestock inventories; c) regarding beef animal imports, Turkey is quite unpredictable market due to governmental regulations. Although Turkey plans to increase import of fattening animals, their preferred origin is South-America. Companies considering exporting animals to Turkey need to pay close attention to

health status of animals to assure the arrival of healthy cattle (NB!epizootic situation in animal resting points).

From the target markets of Breed Expo 2 project, Azerbaijan and Uzbekistan would benefit greatly by importing breeding animals/materials to fasten the genetic improvement of the stock and meet the demand for milk/meat. Further they would greatly benefit from knowhow related to the improvement of veterinary service, reproductive management, feeding, independent milk testing and animal performance recording. The biggest gain from importing cattle or breeding material from Estonia, Finland or Latvia would be for Uzbekistan.

## **2. Market insight**

### **2.1. Azerbaijan**

The Republic of Azerbaijan has a total land area of 86,6 thousand square kilometers and a population of 10 million. Azerbaijan is a middle-income country with a gross national income per capita of 7 762 USD and an estimated population of 10 million people (2022). The oil and gas sectors generate almost 60 per cent of the country's gross domestic product (GDP). Farming provides 6% of Azerbaijan's GDP and is a major contributor to its non-oil economy and has great potential for stimulating growth, job creation and food security. About 47% of the population lives in rural areas, and about 36% of employment is in agriculture and agro-processing. Azerbaijan faced a multifaceted crisis in 2016 when low oil prices led to a contraction of the economy, along with a currency devaluation and a rise in inflation. The government has since adopted a number of strategies to diversify the economy and strengthen the agriculture sector. Raising livestock, mainly cattle and sheep, accounts for nearly half of agricultural production by value. Most farms are made up of several plots each of 1-3 ha, and a typical farm may have just 3-10 livestock. Smallholder farmers generally have scarce financial means and make limited profits from farming activities. Climate change is an increasing challenge for smallholder farmers, while soil erosion threatens sustainability. The Government is striving to implement strategies to address these hazards and to help the rural communities achieve lasting improvements in their living standards.

#### **Cattle breeding**

Rapid increase in the level of income of the population as a result of the oil boom in the country around early 2000s caused a change in demand for food products. Since then, the share of livestock in the structure of gross agricultural output value in the Republic of Azerbaijan has increased dynamically and was 52% in 2020. As a result, Azerbaijan was able to provide itself with 84-85% of all types of meat/meat products and milk/milk products. The main share in the structure of the total value of animal origin products in the Republic of Azerbaijan belongs to meat and milk. The total value of animal origin products in 2020 was 4400.5 million AZN of which 61.5 percent was meat and 29.3 percent milk. At the same time, during the period of 2010-2020, the volume of milk imported to Azerbaijan decreased by

28.7% to 461,000 tons and the export of dairy products increased by 4.3 times compared to 2015 and amounted to 27,000 tons.

The state subsidy policy on livestock is mainly aimed at breeding support, and for this purpose, a farmer receives a subsidy of 100 AZN for each head of calf born by artificial insemination. In 2020, 44,433 animal owners were paid this subsidy and as a result milk productivity is expected to increase. Subsidy was paid only through the "Electronic Agriculture" information system (EAIS). Additionally, during 2008-2018, purebred animals brought to the country by "Agroleasing" OJSC were sold to farmers at a 50 percent discount. During this period 30356 cattle were bought.

Another state support for livestock is related to the benefits provided in the field of agrarian insurance. From 2022, small ruminants from age 11mo – 5y, dairy cattle from 11 mo - 7 y and beef cattle from 11 mo - 3 years of age will be insured on preferential terms. In other words, farmers pay only 50% of the calculated insurance premiums, and the other 50% is paid by the state to support farmers.

The Strategic Roadmap adopted in 2016 stated that while 4,400 veterinarians are required to provide effective veterinary care to the country's 3.8 million head of conventional livestock, about 2,600 veterinarians work in all structures of the State Veterinary Control Service, which meets only 60 % of demand. To overcome the problem, field veterinary stations are gradually denationalized. As part of this process, the practice of conducting preventive vaccinations against infectious diseases among animals will be formed.

### **Dairy production**

The analysis of the information of the Ministry of Agriculture from 2020 shows that 96% of the existing cattle farms in Azerbaijan own up to 20 animals and 80% of the all animals belong to these farms.

The level of self-sufficiency in milk and dairy products in the country is 83.5%. Per capita milk production has increased by 69% (to 220 kg) compared to year 2000. In 2020, Azerbaijan produced 2,192,000 tons of milk and 2,570,000 tons of milk were consumed. Per capita consumption of milk and dairy products in Azerbaijan is low compared to physiological norms, as well as the world average, and the quality is not satisfactory. Taking into account population growth by 2030, the country's demand for milk and dairy products is expected to reach 2,700 tons. According to ARC calculations, in order to meet the demand for milk, it is necessary to improve the import of breeding animals and artificial insemination. For this purpose, a rationale has been developed for the establishment of an intensive farm model and the systematic implementation of artificial insemination. According to estimates, Azerbaijan's annual milk production might reach 3 million tons by 2030 and export potential may arise.

In the coming period, Azerbaijan government will expand activities to build modern livestock farms - agro-parks. Totally 51 fully operational agro-parks and large farms worth 2.1 billion AZN (1,2 billion EUR) are being established on 240,000 hectares in 32 regions of Azerbaijan (43 agro-parks have already initiated their operations). Out of these, 14 specialize in crop

production and animal husbandry, 1 in animal husbandry, and the other in the fields of sorting-packaging, processing and logistics.

Currently the selling price of milk from the farm in the domestic market is 0.45-0.59 AZN/kg. In order for intensive dairy farms to operate efficiently, there is a need for a higher selling price of milk. Suggestions have been made to attract investments in feed production to increase meat and milk production in Azerbaijan. At present, animal feed in Azerbaijan is expensive e.g. feed costs make up 70% of the cost of milk. Not much arable land and pastures have been devoted to the production of feed and the key components for feedstuff (soybean meal, other feed additives) are imported. The government intends to support the development of industrial feed mills, as well as farms, specialized in the production of fodder (hay, grass, silage, corn etc.).

Import of breeding animals exploded since 2019 due to the state subsidy 60%. Main countries where dairy cattle have been imported from are Austria and Germany, also Estonia.

### **Beef production**

In 2020, Azerbaijan produced 346,000 tons of meat and 407,000 tons of meat were used as food. The level of self-sufficiency in meat and meat products was 84.5% . The prognosed meat production in Azerbaijan in 2030 would be 463,000 tons (beef 177.3 thousand tons, mutton 93.9 thousand tons, poultry 190.4 thousand tons, pork 1.5 thousand tons), which is about 40% increase compared to 2020.

Permanent pastures and natural landscapes used for grazing make up about half of the agricultural land in Azerbaijan. However, as a result of inappropriate grazing, the pastures have been degraded and the structure of pasture lands has been disrupted.

The per capita consumption of meat and meat products in 2020 was 33.7 kg. In Azerbaijan, there is a demand for fresh veal in the market, but there is little demand for beef or bull meat. As a result, farmers try to sell their animals as soon as possible, when they are young. It is known, that in Azerbaijan, cattle are slaughtered at about half the average weight compared to the world average. Local processors buy old beef at a relatively low price. The price of meat on the farm is 6.52 euros per kilo, retail price is 7.45 euros. The price of barley is 220 eur/T.

### **Farmer organisations**

In recent years, there have been numerous innovations in the organization of meat and dairy producers in the Republic of Azerbaijan e.g. the establishment of Azerbaijan Livestock Association. The Azerbaijan Livestock Association (ALA) unites individual entrepreneurs and legal entities engaged in the production of livestock and animal products and other related activities. ALA carries out relevant work in this area with economic entities engaged in the production, processing and supply of livestock products (meat, milk, etc.). Concurrently, the Association of Producers and Exporters of Milk and Dairy Products of Azerbaijan was established on January 26, 2018. The association aims to support the development of entrepreneurship in the field of milk and dairy products, the introduction of new technologies

in this area, and increase production and exports. There are also meat and dairy producers among the members of the Rural Women's Association, the Azerbaijan Farmers Association and the Azerbaijan Goat Farmers Public Union.

<https://www.ifad.org/en/web/operations/w/country/azerbaijan>

[https://www.researchgate.net/publication/371227530 Livestock Sector Analysis in Azerbaijan](https://www.researchgate.net/publication/371227530_Livestock_Sector_Analysis_in_Azerbaijan)

## 2.2. Uzbekistan

The Republic of Uzbekistan is a central Asian country with a total land area of 447 thousand square kilometers and a population of 36 million. Uzbekistan is one of Central Asia's best performing economies thanks to remittances, natural gas and oil refining, mining and agriculture. Major reforms are building a more open and market-oriented economy, with increased emphasis on agricultural exports and the productive potential of family farms (dehkans).

Uzbekistan is currently regarded as belonging to the group of lower-middle income countries, however Uzbek authorities have set an ambitious goal to join the group of upper-middle income countries by 2030 as spelled out in the national plan for the modernization of agriculture during 2017-2029.

Agriculture accounted for 25% of GDP in 2020, the highest in the region, and employs 20% of people. Half of Uzbekistan's 36 million people live in rural areas, including 75% of the lower income population. Although poverty rates have steadily declined over the past two decades, being 11% in 2019 the country faces major environmental issues (around a third of Uzbekistan's land is degraded) and although Uzbekistan has a low incidence of undernourishment, its food security score is lower than the regional average. Uzbekistan's GDP per capita was 2,255USD in 2021.

### **Restructuring of agricultural sector**

Following the breakup of the Soviet Union the agricultural sector in Uzbekistan has undergone a deep restructuring. Private ownership of land is currently prohibited by law, as is the use of land as collateral for receiving bank loans. However, several new laws enacted since 1992 have created favourable legislative conditions for a variety of types of farming. The allocation of land to producers has occurred through leasing contracts resulting in the development of three different types of farms: large private farms (shirkats, previously state-owned cooperatives), smallholder or dekhkan farms and private or former farms. Since independence the total area under dekhkan farms has increased significantly and has reached 750,000 ha. Currently there are 4.7 million dekhkan farmers with land plots of 0.35–0.5 ha and they are largely based on household labour. Dekhkan farmers are not subject to control by the Government but are also not provided with any relevant public services (access to fertilizers, fuel, machinery, credit etc.). However, as dekhkan farmers virtually "own" their land they invest in it trying to orient their production towards more profitable and less water-

demanding products (Robinson, 2020). Private or Family Farms or Fermer Khohajaligi are a new market-oriented production unit. In 2007 there were approximately 75,000 private farms, with land under 30–50-year leases. Private farms utilize 5.8 million ha of state-leased land (including uplands and pastures) with an average farm size of 75 ha.

Shirkat farmers dominate wheat and cotton production (under tight governmental control), while dekhkan farmers dominate the horticulture and livestock subsectors (which are much less controlled by the Government); fermer farms are mostly involved in livestock production and account for the majority of sheep and goat production.

The government currently aims to increase the output of fruits, vegetables, milk and livestock, whose production is highly favoured by dekhkan farmers as prices of these commodities are not regulated by government but follow market rules. In fact, the fixed pricing of cotton and wheat has been the indirect cause for the rapid increase in the number of cattle herds during the last decade. The most recent reforms of 2018/2019 aim at the establishment of private farm clusters based on contract farming, replacing the state procurement system.

Nowadays, Uzbekistan's agricultural production still consists mostly of cotton, of which Uzbekistan is the fifth largest world producer and was the third largest world exporter until recently, and wheat. Government agricultural policy is currently aimed at further developing cotton and wheat production to support state hard currency earnings through export, and achieving self-sufficiency in grain production. However, the government of Uzbekistan started diversification of agricultural production in 2017, whereby cotton will be gradually phased out in some areas to be replaced in favour of food crops such as fruits and vegetables.

### **Cattle breeding**

Uzbekistan was the only country in former Soviet Union, which livestock numbers did not plummet but rather remained stable for a decade. Livestock currently constitutes 40% of total Uzbekistan agricultural output and during the last two decades the number of cattle and sheep/goats has more than doubled.

The distribution of livestock production farms is determined by proximity to population centres and agro-ecological zones. Dairy production is concentrated in irrigated areas close to urban centres, and beef production is mostly concentrated in low mountain pastures.

Species wise, cattle dominate in the Uzbek livestock sector, as it contributes 79% of meat and 99% of milk.

Livestock productivity in Uzbekistan is very low compared to the European level.

### **Dairy production**

Cattle breeding is highly developed in irrigated zones. Cattle-breeding farms are concentrated in dekhkan, collective and cooperative farms where cereal crops and cotton are also produced (both of which are used as animal feed). As of October 1, 2022, the cattle population in Uzbekistan reached 13,582.5 thousand heads. A significant share of the total cattle population is in the Samarkand and Kashkadarya regions (12.4%), Bukhara region (9.6%) and the Republic of Karakalpakstan (8.8%). The average milk yield per cow in Uzbekistan is 12.8 liters. Average

price for 1 kg from the farm without VAT: 36.6-42.9 rubles/kg (0.37 – 0.43eur/lkg) Cost of feeding: 2,500-4,000 sum per head (0.18 – 0.3 eur).

There is obvious imbalances in the development of livestock farming and the necessary feed supply. In the period from 2010 to 2022, the cattle population increased by 52 percent but the area of available pastures per head from 2000 to 2021 decreased by 2.75 times - from 3.3 to 1.2 hectares. The need for livestock feed in the country is 120 million tons, but only 47 million tons were produced last year.

Every year since 2018, the volume of imports of dairy products in the country has been growing by an average of 22.5%. In 2023, Uzbekistan imported 36.7 thousand tons of dairy products. To ensure the functioning of the dairy industry, 4 thousand tons of powdered milk were imported in 2022 (translated into milk equivalent - 29 thousand tons). For the production of meat and sausage products in 2022, Uzbekistan imported 8 thousand tons of beef.

With the increase in the purchasing power of the population in Uzbekistan, general demand for dairy products is growing, which stimulates the development of the industry.

### **Beef production**

Most of the red meat production comes from cattle, while the main producers of it are the smallholders (dekhan) farms, which produce 94% of domestic meat. In 2022, meat production reached 2,726 thousand tons, which is 3.4% higher than in 2021. The largest share was accounted for by beef, the volume of which in 2022 amounted to 1,194.1 thousand tons (+1.8% by 2021).

In 2017, the export restrictions for meat products were lifted and Uzbek producers can export their meat produce based on regional market demand and supply. However, the country imports beef to meet domestic demand.

Currently the red meat industry is constrained by the low genetic potential of existing stock; inadequate marketing system including overdue payments, low prices and transportation problems; inadequate infrastructure for veterinary services, inadequate feed resources, weak livestock farmers' organizations and inadequate technical support services.

### **Barriers restraining production efficiency of the livestock sector**

There is a direct correlation between the welfare level of dehqan families and the size of land and the number of livestock they own. Productivity of livestock could be the key for further income gains for families in rural areas. Currently, livestock-keeping activities contribute about 45% of family incomes in the Piedmont areas and more than 50% in the desert and steppe and semi-desert areas, while animal husbandry in the highland areas contributes up to 67% of family income. The well-being of rural families depends not only on the size of the land they can use, and the size of the herd, but also on the quality of their livestock, and access to



productivity-enhancing technologies – especially feed (due to severe shortages), and proper veterinary care for animals.

The need for the organization of livestock cooperatives has been recently underlined by politicians in order to provide family farms with forage, veterinary services and agricultural technologies. Measures are also being taken to organize AI centres in each region, with the aim of implementing AI on at least 70 percent of cows by the end of the year, and to improve the breed qualities of 60 percent of cattle by 2025. This will require an improved interaction between veterinary services and quarantine, sanitation and epidemiology, thus implementing quality control procedures for the entire chain of livestock production.

Some of the knowledgeable livestock farmers are managing to produce maize, alfalfa, and lucerne or legume crops for animal feeding purposes by applying intercropping or double cropping practices. However, the general lack of knowledge and restricted land areas for forage cropping are badly impacting livestock sector performance.

Further modernization of and growth in the livestock sector of Uzbekistan, particularly in the production of meat and milk, would have great social and economic benefits for the nation.

[https://buznet.up.pt/media/outputs/1\\_Uzbekistan\\_country\\_report\\_Livestock\\_Science\\_with\\_pictures\\_FINAL.pdf?v=2](https://buznet.up.pt/media/outputs/1_Uzbekistan_country_report_Livestock_Science_with_pictures_FINAL.pdf?v=2)

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## **2.3. Turkey**

The Republic of Turkey occupies a unique geographical and cultural position at the crossroads of Europe and Asia. Turkey has a total land area of 783 000 square kilometers and a population of 85 million. It is estimated that the country is currently hosting more than 3.5 million refugees.

About one third of the land is arable, and 17.3% of the population lives in rural areas, but this share is declining. Turkey has the largest agricultural economy in Europe and is a regional hub for the production, processing and export of food to large European and Middle Eastern markets. Turkey's agriculture and food industry sector employs about 20% of the workforce and contributes about 7% to GDP. Agriculture is no longer Turkey's main driver of economic growth, but remains vital to rural development, employment, exports and manufacturing.

The livestock sector has a significant role and potential in the Turkish economy and agricultural sector. Approximately 76.3% of agricultural production is plant-based, while 23.7% is animal-based production.

**Animal husbandry** enterprises in Turkey are generally small-scale family businesses with average herd size of 1-120. Majority (92%) of farms own high performance purebred or crossbred cattle.

Feed costs are the biggest concern for livestock businesses in Turkey accounting for 80 percent of total expenditures. Majority (87%) of small and medium-sized farms use ready-made factory feed. At the same time, price of animal feed has doubled within a year due to the declining Turkish Lira against the U.S. dollar and Turkey's reliance on imported feed (half of the 27 million tons of compound feed produced in Turkey in 2022 originates from imported ingredients). Therefore, preservation of grasslands is becoming more important in order to reduce feed costs in livestock business; however, lands for grazing have decreased from 40 million hectares to 12 million hectares over the last 50 years. Due to the demand-supply gap there are attempts to expand local forage production but this has been complicated due to competition with food crops, dry weather conditions, and poor pastureland management. Turkey's government is trying to stabilize the livestock sector also via regulating feed pricing through the government-affiliated entity, Turkish Grain Board. However, the livestock sectors opinion remains that subsidies for feed ingredients, f.ex. imported barley are not sufficient for consistent profit margins. Additionally, Turkey does not have a competitive advantage for feeder cattle operations, as only 40 percent of the forage needs of animals is provided by natural grasslands in Turkey.

### **Livestock numbers are in decline**

Already third consecutive year mainly smaller producers exit from the business due to disparity between production costs and the farmgate milk price. In 2023 cattle numbers decreased by 4% to 16.2 million head compared to 2021.

Decline in cattle numbers has led to rise in retail prices for meat and milk. A kg of ground beef cost 300 TL (\$11.35/kg) in August 2023 (more than 2.5 times than in 2022) Turkey's government has tried to counterbalance the escalating beef prices by authorizing feeder cattle imports in 2023. However, with limited success.

At the beginning of 2019, the government decided to restrict breeding cattle imports, and the Ministry of Agriculture and Forestry stopped issuing import permission for dairy cattle. The Ministry's aim was to establish domestic breeding cattle production centers throughout Turkey and provide breeding genetics to producers directly. However, the specified establishments, which belong to the government-affiliated Directorate General of Agricultural Establishment, remain inactive, forcing the Ministry to allow imports of breeding cattle again.

### **The vast majority of cattle in Turkey are for dairy production**

Out of 16 million cattle in Turkey, only 2 million are of beef breeds.

The National Milk Council sets the raw milk base price every 6 months. In July 2023, they raised the raw milk reference price by 35% from 8.5 Turkish Lira (TL) per liter (\$0.31/liter) to 11.5 TL (\$0.43) but farmers argue it's still not enough to cover the costs, with the production cost of one liter of milk at 12 TL.

The Meat and Milk Board (ESK) is the regulatory body for the Turkish domestic milk market to keep milk prices stable for consumers and to make prices profitable for producers. Since there is a milk surplus in Turkey (milk self-sufficiency 117, 4% in 2023), ESK is purchasing raw milk from domestic producers and converting raw milk to milk powder in contracted milk processing facilities. Then ESK exports milk powder and its products to other countries, mostly in eastern Asia.

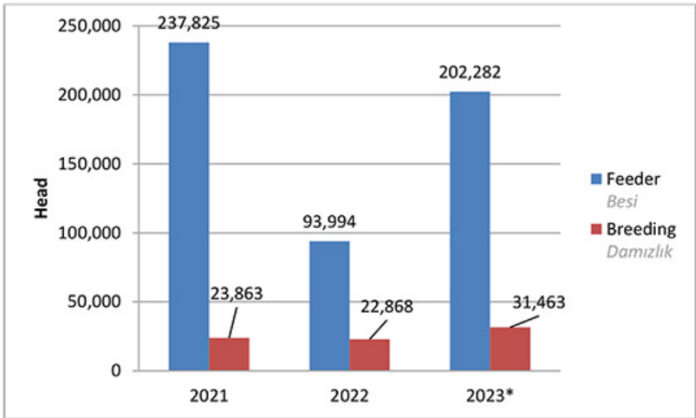
**Cattle import mainly for beef production**

From January-June 2023, Turkey imported about 234,000 head of cattle (\$361.4 million), which is 400 percent more than the same period last year. Imports were mostly feeder cattle from Uruguay, the Czech Republic and Hungary, with a smaller amount of dairy breeding animals from Germany, Denmark, and the Czech Republic. It is forecasted that cattle imports remain steady in 2024 compensating for the shrinking domestic cattle numbers and reduce skyrocketing retail beef prices. Most of these 470,000 imported animals will be feeder cattle for beef production.

According to industry contacts, livestock producers who buy imported feeder cattle will receive a government-guaranteed price when selling their finished animals for slaughter. This price guarantee is supposed to encourage the expansion of feeder cattle operations and increase beef production. However, according to cattle producers, the price guarantee has not helped to offset their production costs. In the meantime, beef prices have continued to climb higher.

MinAF uses outdated EU health certificates for live cattle imports but does not allow imports from all EU-approved countries. Instead, the Ministry authorizes imports from countries, based on its own evaluation of the country's livestock.

**Turkey cattle import 2021 – 2023**

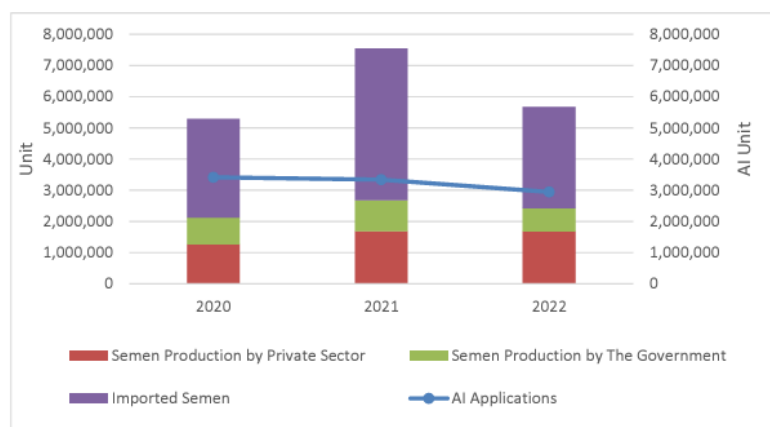


Source: Trade Data Monitor, LLC \* 2023 data includes January- June.

## Drop Off in Production and Imports of Livestock Genetics

Both the production and import of genetic material used in artificial insemination (AI) has fallen sharply in the last couple of years. The production of bull semen has fallen 11% since 2022 to 2.4 million doses. For the same period, because of the devaluation of the Turkish Lira and the government's overregulation of livestock genetics, semen imports fell 33% to 3.2 million doses. To rebuild livestock inventories in the future, Turkey will need to increase its use of domestic and imported livestock genetics.

## Semen Production, Imports, and Number of Artificial Insemination (AI) Applications, 2020-2022



Source: The Ministry of Agriculture and Forestry and Trade Data Monitor, LLC.

Disease outbreaks, like foot and mouth disease and earthquakes have added to the sector's difficulties. In addition, the sector has struggled for years with poor livestock health conditions, which result in 400,000 dead calves each year.

<https://doi.org/10.37496/rbz5320230007>

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