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Current Status, Problems and Solution Suggestions for Cattle, Goose, Bee and Horse Breeding in Ardahan Province

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Abstract

This review aims to examine the current status of cattle, goose, bee, and horse breeding in Ardahan province and to evaluate the main problems encountered in the sector along with possible solution suggestions. Ardahan, due to its climatic and geographical conditions, possesses significant potential for livestock production; however, it faces various challenges such as deficiencies in production techniques, marketing problems, feed supply issues, and insufficient veterinary services. The review particularly focuses on cattle, goose, bee, and horse breeding, the economic, social, and cultural significance of these species for Ardahan. Cattle breeding constitutes the main source of livelihood for the local population, while goose breeding stands out as one of Ardahan's traditional and indispensable production activities. Additionally, beekeeping is important in terms of providing supplementary income. The review presents recommendations aimed at improving productivity in livestock breeding in Ardahan and evaluates strategic approaches that can support sustainable production.

Keywords: Ardahan Province, Beekeeping, Cattle Breeding, Goose Breeding, Horse Breeding.

Ardahan İlinde Sığır, Kaz, Arı ve At Yetiştiriciliğinin Mevcut Durumu, Sorunları ve Çözüm Önerileri

Öz

Bu derleme, Ardahan ilinde sığır, kaz, arı ve at yetiştiriciliğinin mevcut durumunu inceleyerek, sektörde karşılaşılan başlıca sorunları ve olası çözüm önerilerini değerlendirmeyi amaçlamaktadır. Ardahan, iklim ve coğrafi koşulları nedeniyle hayvancılık açısından önemli bir potansiyele sahip olmakla birlikte, üretim teknikleri, pazarlama sorunları, yem temini ve veteriner hekim hizmetlerindeki yetersizlikler gibi çeşitli güçlüklerle karşı karşıyadır. Derlemede özellikle sığır, kaz, arı ve at yetiştiriciliği üzerinde durulmuş ve bu türlerin Ardahan için ekonomik, sosyal ve kültürel açıdan taşıdığı önem ele alınmıştır. Sığır yetiştiriciliği bölge halkının temel geçim kaynağını oluştururken, kaz yetiştiriciliği Ardahan'ın geleneksel ve vazgeçilmez üretim faaliyetlerinden biri olarak öne çıkmaktadır. Ayrıca arıcılık ek gelir sağlaması bakımından önem taşımaktadır. Derlemede, Ardahan hayvancılığında verimliliğin artırılmasına yönelik öneriler sunulmuş ve sürdürülebilir üretimi destekleyecek stratejik yaklaşımlar önerilmiştir.

Anahtar Kelimeler: Ardahan İli, Arıcılık, At Yetiştiriciliği, Kaz Yetiştiriciliği, Sığır Yetiştiriciliği.

Introduction

Ardahan, located in the northeastern part of the Eastern Anatolia Region, is Türkiye's third smallest province, covering an area of 4,934 km² with a population of 92,820. Ardahan, together with its central district, consists of 6 districts, 7 municipalities, 41 neighborhoods, and 225 villages. Approximately 46.47% of the province's population lives in the urban center, while 53.53% resides in rural areas. The province, located at an altitude of 1,825 meters above sea level, reflects the high plateau characteristics of the region. The province is dominated by a continental climate, characterized by long, harsh, and snowy winters, with temperatures occasionally dropping to extremely low levels during the winter months (Topcuoğlu et al., 2016; Dede, 2023; Kaltakkıran, 2024). Ardahan province possesses significant potential due to its extensive pasturelands, climatic conditions, and traditional livestock farming culture. However, the full potential cannot be realized, as structural problems in the region and various obstacles faced by producers limit the development of livestock farming in Ardahan. This review addresses the current status of livestock farming in Ardahan province, the main challenges encountered, and potential solution strategies.

The economy of Ardahan province is largely based on the livestock sector, with cattle breeding being particularly prominent. Livestock activities in the province are primarily focused on milk and meat production, while live animal trade also constitute an important source of income for the local population. In addition to cattle breeding, beekeeping and poultry farming especially goose breeding play a significant role. Furthermore, limited aquaculture is also practiced in the province. In Ardahan province, sectors such as industry, tourism, and trade remain underdeveloped, with a limited share in the provincial economy; however, a partial increase in these areas has been observed in recent years (Akbulak, 2016; Topcuoğlu et al., 2016; Birinci, 2018).

A significant portion of Ardahan's population relies on livestock for their livelihood, highlighting the critical importance of cattle breeding for the development of the livestock sector. The province encompasses a total area of 4,934,000 decares, of which 2,458,230 decares are designated as pasturelands. The total area of meadows and pastures accounts for approximately 59% of the province, which is three times higher than the national average of 18%. This situation facilitates the practice of pasture-based livestock farming in Ardahan (Eştürk and Mert, 2022). Considering that crop production is carried out on a very limited scale due to climatic conditions, the importance of livestock for the local population becomes more evident. While the region's climate supports the development of livestock by being suitable for forage crop production, the long and harsh winters pose a significant challenge. Prolonged snow cover on pastures and meadows increases the duration that animals must be kept indoors (Polat, 2017).

Current Status of Cattle, Goose, Bee and Horse Breeding in Ardahan Province

Although cattle farming is practiced in nearly every region and province of Türkiye, production intensity is notably higher in certain areas. In particular, the Central Anatolia, Aegean, and Eastern Anatolia regions stand out in terms of both livestock numbers and production volume. The Central Anatolia Region, with its extensive agricultural lands, high feed production potential, and concentration of modern farm investments, provides a suitable environment for the development of large-scale dairy and fattening enterprises. Konya province, located in the Central Anatolia Region, ranks first with a cattle population of 944,838 heads, accounting for approximately 6% of Türkiye's total production. In the Aegean Region, the dairy industry infrastructure, established cooperative culture, and proximity to markets support the sustainability of small- and medium-sized family farms. İzmir province, located in the Aegean Region, ranks second with a cattle population of 883,647 heads, representing approximately 5.2% of Türkiye's total production. The Eastern Anatolia Region, with its extensive pasturelands and ecologically favorable conditions for livestock, is traditionally and widely known for cattle farming. Among the provinces in the region, Erzurum ranks third with a cattle population of 709,861 heads, accounting for approximately 4.2% of Türkiye's total production (TÜİK, 2024).

The Eastern Anatolia Region, with its extensive pastures, rich vegetation, and cool climatic conditions, is one of Türkiye's important areas for cattle farming. In the region, production is largely based on traditional farming and family-run enterprises. The region's geographical structure and traditional production culture particularly facilitate the concentration of cattle breeding. A significant portion of Türkiye's total cattle population is located in this region, contributing substantially to the national economy through meat and milk production. The province with the highest cattle population in the region is Erzurum, followed by Kars and Ardahan (TÜİK, 2024).

Ardahan province, with a cattle population of 331,010 heads, ranks 14th nationwide and 3rd among the provinces of Eastern Anatolia in terms of cattle numbers (TÜİK, 2024). Considering Ardahan's land area and population size, this proportion is quite remarkable. This is because it surpasses many major cities and agriculturally developed provinces in terms of cattle population. This situation clearly highlights Ardahan's potential for cattle breeding and its livestock-based economic structure. The prominence of Ardahan in cattle numbers is largely attributed to the province's extensive and fertile pastures, favorable climatic conditions for livestock, and traditional breeding culture. In addition, pasture-based livestock farming, a typical feature of the Eastern Anatolia Region, is intensively practiced in Ardahan, contributing to the high cattle population (Güven, 2021; Yüzbaşıoğlu, 2022; Ayvazoğlu and Demir, 2023).

In Ardahan province, apart from a limited number of modern fattening enterprises, cattle farming activities are generally carried out in the form of dairy production and combined livestock farming within small-scale production models; these production practices are largely supported by traditional methods and region-specific traditional barn designs, reflecting regional cultural characteristics in both production techniques and animal housing systems (Tilki et al., 2013; Güven, 2021).

Ardahan province stands out not only in terms of cattle numbers but also with respect to goose populations across Türkiye. There are a total of 1,303,026 geese in Türkiye. Kars is by far the leading province in goose breeding, with 533,316 geese, accounting for 40.93% of the country's total. Kars is followed by Ardahan, which has 127,534 geese, representing 9.79% of the total population. When these two provinces are considered together, they account for half (50.72%) of Türkiye's total goose population (TÜİK, 2024). This indicates that Kars and Ardahan serve as a strategic center for goose breeding not only regionally but also at the national level. Several key factors contribute to the prominence of Kars and Ardahan in goose breeding. Firstly, the extensive and natural pasturelands in these provinces provide significant advantages for the feeding and natural living conditions of geese. In addition, the region's harsh climatic conditions align with the resilient nature of geese, contributing to the high quality of their meat, fat, and feathers. The centuries-old traditional production culture and the role of goose breeding in the rural economy also form the socio-economic basis for this concentration (Kırmızıbayrak, 2018; Kırmızıbayrak, 2020; Karadağ, 2025a).

Goose breeding in Türkiye is primarily based on pasture feeding and seasonal meat production. This practice extends the breeding period in provinces such as Kars and Ardahan, where consumption is seasonal, thereby increasing maintenance and feeding costs. In these two provinces, meat goose farming is primarily conducted by small-scale family enterprises, and the process typically lasts 8–9 months. During the first six months of this period, geese are fed primarily on pasture, while in the final two months, a feeding system is implemented that combines pasture feeding with the addition of grain-based feeds (Kırmızıbayrak, 2002; Tilki and Saatcı, 2016). The fact that the feeding process relies largely on pasture indicates that goose breeding in Türkiye is compatible with organic production conditions (Oral and Ak, 2020). Goose meat production in Kars and Ardahan serves as an important source of livelihood for the local population and has also become a significant sector that strengthens the region's economic structure. In recent years, goose meat has also appeared on food industry menus and is in demand in restaurants and hotels, thereby allowing goose breeding in Kars and Ardahan to reach a wider market (Kırmızıbayrak, 2020).

Ardahan province is one of Türkiye's notable provinces due to its rich livestock resources. While cattle numbers and goose breeding are prominent in the province, beekeeping activities also hold strategic importance. In particular, the Caucasian honeybee (*Apis mellifera caucasica*), which possesses genetically superior traits, is one of the most important factors that distinguish Ardahan in beekeeping. Ardahan is also one of the pilot regions designated in Türkiye for the conservation and breeding improvement of the Caucasian honeybee (Önk et al., 2016; Gül and Nergiz, 2022). The Caucasian honeybee's adaptation to low temperatures, high nectar foraging ability, and long tongue, which enables superior performance under diverse floral conditions, enhance the competitiveness of beekeeping in Ardahan (Önk et al., 2016). The Caucasian bee has been officially registered under the Notification on the Registration of Native Animal Breeds and Lines. In 2000, Ardahan and Artvin provinces were designated by the Ministry of Agriculture and Forestry as the genetic centers for the Caucasian bee, thereby officially protecting the pure populations of this bee breed in these regions (Şahinler and Gül, 2003; Gül and Nergiz, 2022). By designating Ardahan and Artvin as isolated zones, access to foreign

beekeepers is restricted to prevent any disruption of the genetic integrity of the Caucasian bee (Güler et al., 2002).

Across Türkiye, there are a total of 97,984 beekeeping enterprises. Among these, Ardahan ranks 56th nationwide with 707 enterprises (TÜİK, 2024). Although the number of enterprises in Ardahan is relatively low, beekeeping activities in the province have significant regional and qualitative potential. One of the main reasons for Ardahan's prominence in beekeeping is its rich floral diversity and natural vegetation. In particular, the high altitude, extensive plateaus, and natural plant areas directly influence honey yield and quality, providing the basis for Ardahan honey's distinctive aromatic characteristics (Çetin et al., 2015; Önk et al., 2016; Gül and Nergiz, 2022).

The horse population in Ardahan province also holds a notable position. Particularly in Ardahan's mountainous and rugged terrain, horses have traditionally served as an important labor resource for both transportation and agricultural activities. Horses are important in rural households in the region not only for riding or carrying loads but also as an integral part of social and cultural life. From an economic perspective, horse breeding may not provide a direct high-income source; however, it plays a complementary role in sustaining rural life and meeting the needs of small-scale agricultural enterprises (Kırmızıbayrak et al., 2004; Karadağ and Kırmızıbayrak, 2024). As of 2024, the horse population in Türkiye was recorded at 70,360 heads (TÜİK, 2024). The high horse population is influenced by agricultural enterprises, studs, private farms, and hippodromes established by the state in some provinces (Köseman and Şeker, 2016; Kocakaya et al., 2023). Ardahan province ranks 13th nationwide with 1,516 horses (TÜİK, 2024).

General Problems of Livestock Farming in Ardahan Province

In Ardahan, livestock farming faces various challenges that limit the sector's productivity and sustainability. Although the province has significant potential due to its extensive pastures, favorable climatic conditions, and traditional breeding culture, there are common structural problems across all animal species, such as cattle, geese, bees, and horses (Atasever et al., 2013; Ayvazoğlu et al., 2021; Murat, 2023; Karadağ, 2025b). Livestock farming in Ardahan province has a high potential due to its natural resources, extensive and fertile pastures, rich genetic diversity of animals, and long-established traditional breeding culture. However, structural constraints such as limited modern production techniques, traditional housing systems, inadequate feed and nutrition facilities, infrastructural deficiencies, and problems in animal health and disease management pose significant limitations to productivity and sustainable development in the sector. In addition, shortcomings in the processing, marketing, and value enhancement of animal products restrict producers' income levels and negatively affect the overall development of the livestock sector. Furthermore, the generally low education level and advanced age of many producers hinder the adoption of modern technologies and best management practices, limiting the potential for innovation and efficiency improvements in livestock production. Many small- and medium-sized enterprises operate based on traditional methods and are unable to compete with modern and intensive production practices (Vural and Fidan, 2007; Köseman and Şeker, 2015; Tapkı et al., 2018; Güven and Yavuz, 2020; Yüzbaşıoğlu, 2022).

A large proportion of livestock farming activities rely on native breeds and traditional housing systems. The fact that native breeds exhibit genetically lower productivity compared to commercial breeds leads to a significant loss of income. In addition, the lack or inadequacy of ventilation in traditional barns, insufficient space per animal, and the inability to isolate diseased animals both increase the risk of disease and complicate disease management. This situation not only causes productivity loss but also increases low performance and mortality rates in animals (Tilki et al., 2013; Ayvazoğlu and Gökçe, 2020; Güven, 2021; Ayvazoğlu et al., 2022).

Low productivity levels, insufficient feed resources, and deficiencies in disease control are common issues in goose farming. Production largely relies on traditional methods; the lack of widespread modern incubation, housing, and feeding systems poses a significant disadvantage in terms of productivity and animal welfare. Furthermore, the absence of an organized structure for processing and marketing products prevents producers from achieving adequate economic returns. The lack of adequate hygiene and biosecurity practices increases the risk of disease, negatively affecting the sustainability of the sector (Kırmızıbayrak, 2018; Kırmızıbayrak, 2020; Eştürk, 2024; Karadağ, 2025b).

In Ardahan, beekeeping, another important branch of livestock activities, also faces various challenges. Although the region is the genetic center of the Caucasian bee, the introduction of bees from outside threatens this genetic purity. Additionally, inadequate colony management and the limited application of modern beekeeping techniques result in low honey productivity. Due to climatic conditions, the short and cool honey production season limits output, while inadequacies in marketing channels make it difficult for producers to achieve economic gains (Dodoloğlu and Erdoğan, 2022). Thus, the structural and productivity problems observed in cattle and goose farming similarly play a limiting role in beekeeping in terms of sustainability and economic efficiency.

Proposed Solutions for the Development of the Livestock Sector in Ardahan Province

Although the livestock species raised in Ardahan face common challenges, there are also shared solution strategies. Comprehensive measures are required to utilize the region's existing potential more efficiently and ensure the sustainability of livestock farming. Promoting modern housing and incubation facilities, implementing programs that support enterprise capacity expansion, and widespread adoption of herd health management would enhance animal welfare, reduce production costs, and prevent losses due to diseases. Strengthening cooperatives and improving marketing channels would increase producers' income and organizational capacity (Atasever et al., 2013; Abacı, 2015; Güven, 2021). In goose farming, modern incubation and housing systems, along with branding initiatives and training programs, would improve productivity and sector organization (Kırmızıbayrak, 2018; Kırmızıbayrak, 2020; Karadağ, 2025b).

In beekeeping, implementing regional isolation and control measures to preserve the genetic purity of the Caucasian bee, along with the widespread adoption of modern beekeeping techniques and colony management strategies, will increase productivity. Diversifying bee products such as propolis, royal jelly, and pollen, and developing geographically indicated products can enhance the brand value of Ardahan honey (Dodoloğlu and Erdoğan, 2022). In horse breeding, integrating rural tourism and cultural activities, supporting projects aimed at conserving local genetic resources, and promoting breeding for sport and tourism purposes will contribute both to economic diversification and to the promotion of the region. This holistic approach will ensure the effective utilization of Ardahan's livestock potential while directly supporting regional development (Karadağ and Kırmızıbayrak, 2024).

Conclusion

Ardahan is one of Türkiye's regions with high livestock potential, owing to its natural resources, genetic animal diversity, and traditional breeding culture. However, addressing the existing challenges is of great importance. In this context, improvement initiatives and effective promotion of the products obtained will enhance the competitiveness of the province's livestock sector. Moreover, expanding education and awareness activities and ensuring diversity in breeding practices will provide significant contributions to Ardahan's economic development and the implementation of sustainable livestock policies. In particular, promoting animal products produced in Ardahan at both national and international levels, supported by methods such as advertising, fairs, festivals, and digital marketing tools, will increase their brand value and contribute to income diversification for producers.

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