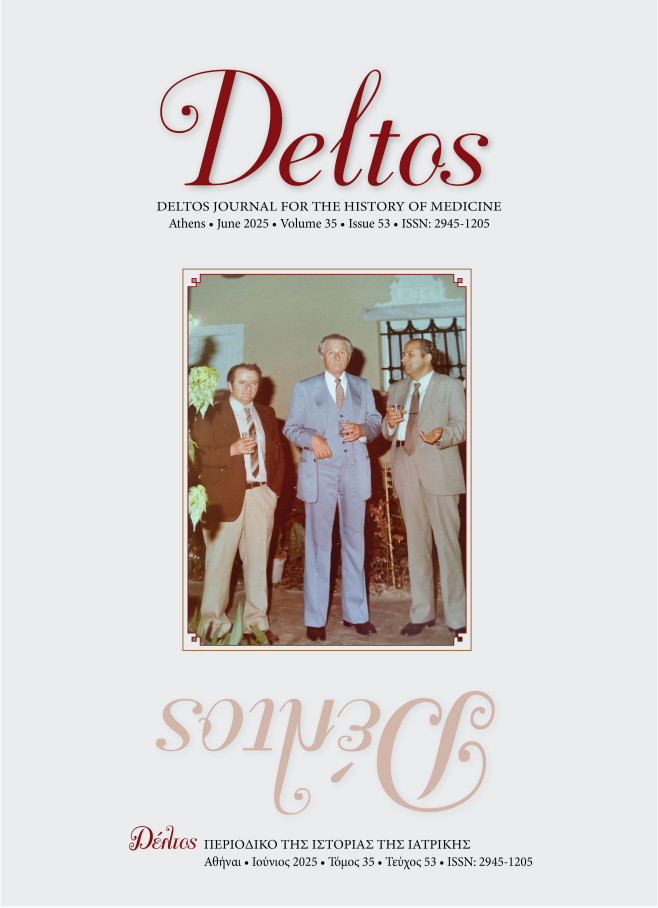
DELTOS

Vol 35, No 53 (2025)



The Evolution of Veterinary Medicine in Turkey: From Ancient Civilizations to the Present

Elif Şahin

doi: 10.12681/dj.42272

To cite this article:

Şahin, E. (2025). The Evolution of Veterinary Medicine in Turkey: From Ancient Civilizations to the Present. *DELTOS*, *35*(53), 48–56. https://doi.org/10.12681/dj.42272

Deltos 2025 June 35(53):48–56

The Evolution of Veterinary Medicine in Turkey: From Ancient Civilizations to the Present

Şahin, Elif[1]

Figure 1. A page from from the Hippiatrica with written and illustrated instructions on drenching a horse to induce diarrhea. 14th century edition.[10] *https://en.wikipedia.org/wiki/Hippiatrica*

Abstract

Veterinary medicine, which supplied the medical study, diagnosis, and treatment in animals, has a broad and long history. Being able to understand how these practices have evolved over time is important for those who seek to appreciate the various advances and challenges which this field has gone through. In particular, such history is deeply interwoven with cultural, political, and economic transformations in Turkey. While the major focus of this article is to discuss the development process of veterinary medicine in Turkey, it also points to several key periods, figures, and contributions that make its trajectory intelligible. The history of veterinary medicine in Turkey is, in essence, importantly characterized by developments and contributions that cut across different eras. From early practices undertaken in ancient civilizations to the integration of Islamic medical knowledge and modernization efforts driven through the Ottoman Empire, each period has simply built upon the gains of the last. The Early Republican Period in the leadership of Mustafa Kemal

[1]İstanbul Yeni Yüzyıl Üniversitesi, Faculty of Pharmacy, Veterinarian- pharmacologist/toxicologist, Istanbul, Türkiye

Atatürk laid a robust foundation for contemporary veterinary education and practice. This technology and infrastructural development in the mid-to-late 20th century resulted in substantial improvements in health and productivity in animals. Veterinarians in Turkey continue to play a cutting-edge role in public health, food safety, and wildlife conservation, while facing a new set of challenges and opportunities that call for innovative ideas and international collaboration

Key Words: *History of veterinary medicine, Anatolia,Türkiye*

Introduction

Veterinary medicine generally relates to the area of medicine responsible for the prevention, diagnosis, and treatment of diseases in animals. It has a somewhat rich and varied history. Understanding the evolution of veterinary practices puts into perspective the development, successes, and setbacks experienced therein. In Turkey, the history of veterinary medicine is deeply associated with the cultural, political, and economic transformations of the country. Since the times of the ancient Anatolian civilizations down to the establishment of the modern republic, veterinary medicine has played an indispensable role in public health, agriculture, and animal welfare. Based on this, this article will try to discuss the development of veterinary medicine in Turkey, underlining major periods, figures, and contributions responsible for its trajectory. It is for this reason that the history of veterinary medicine in Turkey is done—to understand the wider perspective it occupies in the annals of medical and scientific progress, and understand the immense contribution veterinarians have made to society.

1. Early Domestication and Care of Animals in Anatolian Civilizations

The land of Anatolia played a crucial role in the early domestication and care of animals, serving as a vital region for ancient civilizations such as the Hittites and Phrygians. These societies made significant contributions to the development of veterinary practices essential for maintaining domesticated animals.[1-3] The Hittites, who established a powerful empire in Anatolia around 1600 BCE, demonstrated advanced agricultural and animal husbandry techniques. They domesticated horses, cattle, sheep, and goats, and their expertise in breeding and raising these animals is well-documented on cuneiform tablets. These records provide valuable insights into veterinary treatments, breeding practices, and the religious and economic roles of animals. The Hittites' respect for animal welfare is also reflected in their mythology, highlighting their awareness of the importance of animal care.[2-4]

The Phrygians, emerging around 1200 BCE, built upon the traditions of their Hittite predecessors in animal domestication and veterinary care. Renowned for their connection to horses, these animals were central to Phrygian culture and economy. The legendary King Midas is often depicted alongside horses, emphasizing their significance in Phrygian society. Archaeological evidence, including artifacts and inscriptions, suggests the Phrygians developed specialized knowledge in animal husbandry, particularly in disease prevention and treatment.[5]

Veterinary Practices in Ancient Greece

In ancient Greece, animals played a crucial role in various aspects of society, functioning as agricultural workers, means of transportation, assets in warfare, and even as companions or sacred symbols. Due to their significant roles, a focused interest in maintaining their health emerged, forming the early foundations of what is now considered veterinary care. While veterinary medicine in Greece was not as developed or organized as human medicine, ample evidence from texts, inscriptions, and archaeological discoveries demonstrates the existence of dedicated practices aimed at animal health.

Horses, among all animals, demanded the most diligent care in ancient Greece, primarily because of their pivotal role in warfare and transportation. The strength and readiness of cavalry forces were vital to the success of many city-states, where the condition of a horse could determine the outcome of battles.[6] Specialists in equine care, often referred to as "horse-doctors" (ἱππίατροι), were esteemed for their expertise in treating injuries and illnesses affecting horses. Their skills ensured that these prized animals remained capable and reliable, both on the battlefield and in other essential duties.[7]

The Hippiatrika: A Window into Ancient Equine Medicine

A key source of knowledge about Greek veterinary practices, especially concerning horses, is the Hippiatrika (Ἱππιατρικά), a collection of Byzantine manuscripts that compile earlier Greek writings on equine

care.[8] Although the surviving manuscripts primarily date to the medieval period, they preserve content likely originating from the Hellenistic and Roman eras.[9] These texts cover various aspects of horse care, including anatomy, feeding practices, stable design, and treatments for a range of ailments, such as sprains, hoof issues, and internal illnesses. Remedies described in the Hippiatrika range from practical techniques, like thoroughly cleaning wounds, to ritualistic approaches, reflecting the broader medical and occasionally superstitious beliefs of the time.[10]

Greek veterinary practices were shaped by the dominant theories of human medicine, notably those found in the Hippocratic corpus, which emphasized the concept of humoral balance.[11] Ideas of "hot," "cold," "moist," and "dry" were applied to animal physiology, guiding practices such as dietary modifications, environmental adjustments, and changes in training routines.[12] This focus on restoring and maintaining bodily equilibrium represented a universal medical framework that transcended human care, influencing the treatment of livestock and working animals alike.

Aristotle's Observations and Comparative Anatomy

Aristotle (384–322 BCE) made significant contributions to the study of animals through his work in comparative anatomy and zoological classification, though his focus was primarily philosophical and scientific rather than clinical.[13] In *History of Animals*, he documented a wide array of species, analyzing their physical characteristics, behaviors, and typical ailments. While not intended as a veterinary guide, Aristotle's methodical approach offered a foundational framework for understanding animal physiology and, by extension, their potential diseases, influencing subsequent studies in the field.

Xenophon and Practical Horsemanship

Xenophon (430–354 BCE) offered significant insights into equine care through his writings, including *On Horsemanship* and *Hipparchicus*.[14] These works delivered practical advice on selecting sound horses, setting up appropriate feeding routines, and diagnosing issues like lameness or respiratory distress.[15] Importantly, Xenophon highlighted the value of humane treatment and diligent observation, stressing the need to identify potential problems early by noting slight changes in a horse's movement or appetite, thus preventing minor issues from escalating into major health concerns.[16]

Care for Other Livestock and Companion Animals

Although horses dominate the surviving sources, the Greeks also addressed the health of other livestock—such as oxen, sheep, goats, and pigs—given their essential roles in agriculture and domestic life. Inscriptions and farming records reveal common practices like disinfecting wounds, treating infections, and managing complications during birthing. Some evidence even points to remedies for dogs, valued as guard animals, hunting companions, and herding aids, though detailed descriptions of canine treatments are limited.[17]

While veterinary practices in ancient Greece lacked the organized sophistication of human medicine, they were integral to the broader Greek tradition of healing. Influential contributions, including Aristotle's anatomical studies, Xenophon's practical guidance, and the enduring Hippiatrika, later shaped Roman veterinary texts and informed medieval and Byzantine scholars who sought to preserve classical knowledge.[18] Thus, ancient Greek approaches to animal health, rooted in empirical observation and contemporary medical theories, established the groundwork for the gradual evolution of modern veterinary science.

2. The Byzantine Empire Period

Veterinary Practices in Byzantium

The Byzantine Empire carried forward many of the medical and scientific traditions of the ancient Greek world, including practical and theoretical approaches to the health of animals, especially horses, resulting in a distinctive body of veterinary knowledge.[19] The writings of Aristotle and Xenophon formed the basis of Byzantine veterinary understanding, but new socioeconomic circumstances—changing cavalry tactics, a broader integration of pack animals, and a vibrant court culture—also shaped these practices.

Early Byzantine veterinary care built upon Hellenistic and Roman sources like the works of Apsyrtos, Pelagonius, and others. Between the 5th and 10th centuries CE, many such texts were collected into the Hippiatrica (Ἱππιατρικά), a corpus of medical texts.[20] Byzantine compilers re-arranged, expanded, and annotated these materials to align with the Empire's needs, addressing local diseases and including topics such as diet, grooming, and stable management. The Hippiatrica forms one of the most important works of Byzantine veterinary medicine.[22] It combines purely practical advice with theoretical discussions rooted in Hippocratic notions of the "four humors." While

humoral theory underscores continuity with Greek medicine, references to prayers and blessings show a growing influence of Christian religiosity on healing practices.[23,24]

Military Imperatives and Prestige

Horses were vital symbols of power and tools of diplomacy in Byzantine society, used not just for travel or farming, but also in the Empire's cavalry forces. Military manuals like the *Taktika* of Emperor Leo VI highlight the critical need for veterinary knowledge[25]. At court, fine horses were status symbols, and their well-being was entrusted to specialized stable staff who likely used techniques from the Hippiatrica[26,27] (Figure 1).

Beyond Horses: Other Domesticated Animals

Other domesticated species, such as oxen, mules, and donkeys, were essential for agriculture and transportation.[3,15] Although fewer treatises exist for these animals, the 10th-century *Geoponika* occasionally references livestock care.[3,16,17] Dogs also received care for injuries, parasites, and diet, though detailed medical instructions for canines are limited.[16,18]

Integration of Religious and Empirical Approaches

Religious rituals were often integrated into otherwise empirical medical procedures. Prayers to Christian saints could be invoked for livestock recovery, reflecting the Byzantine worldview in which secular science coexisted with Christian faith.[19,22]

Byzantine veterinary texts did not vanish after 1453; manuscripts of the Hippiatrica continued to circulate in Greek and Latin translations. Their emphasis on equine anatomy, stable management, and disease diagnostics laid groundwork for more systematic veterinary medicine in the post-medieval era.[23,24]

Religious Influence

Christianity had a significant influence on Byzantine attitudes toward animals. While often anthropocentric, horses were especially cared for because of their military importance.[25,26] The state supported breeding and training programs, and although veterinary specialists were not institutionally formalized, they played a key role in maintaining the empire's military capability.[26,27]

Influence of Islamic Medicine on Veterinary Practices

The rise of Islam brought significant progress in various scientific fields, including veterinary medicine. Islamic scholars built on the knowledge of earlier civilizations (Greek, Roman, Persian), making notable contributions to veterinary care. This era promoted a holistic approach focusing on environment, diet, and the ethical treatment of animals, as advocated by Islamic teachings.[3,15]

Translations and preservation of classical texts (Aristotle, Hippocrates, Galen) were critical to advancing veterinary practices (Figure 2). Islamic veterinarians introduced innovative techniques and documented discoveries in comprehensive works like *Kitab al-Baytara* by Ibn al-Awwam.[3,16,17]

The Seljuk Empire

The Seljuk Empire (1037–1194) covered much of the Middle East and Anatolia. Known for supporting science and medicine, the Seljuks set up veterinary schools and hospitals (bimaristans) serving both humans and animals.[16,18] Scholars developed treatments for common horse ailments, surgical interventions for injuries, and produced texts widely used across the Islamic world (Figure 3).

3. Veterinary Practices During the Ottoman Era

During the Ottoman Empire (1299–1922), veterinary medicine advanced and became more formalized. Building on previous civilizations' achievements, the Ottomans integrated veterinary services into military and agricultural sectors, establishing schools in major cities and instituting regulations to ensure proper training.[19,22] Veterinary work addressed public health issues by managing diseases like anthrax and rabies. Islamic principles of compassion underpinned animal welfare efforts, integrating veterinary medicine into broader social and economic life.

Figure 2. This copper engraving, dates back to 1541, It shows the ancient physician Galen demonstrating through a public vivisection how a pig stops screaming when the nerves to its vocal cords are severed. *https://en.3rcenter.dk/laboratory-animals/history-of-animal-testing/animal-research-in-the-age-of-antiquity*

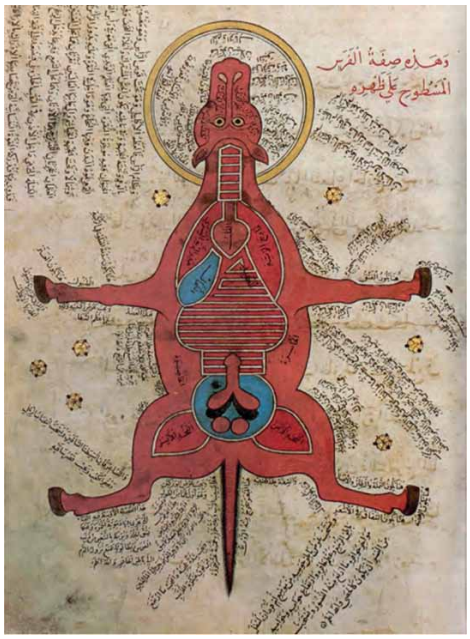


Figure 3. Horse anatomy in a Baytarname. In Turkish tradition, especially within the Ottoman realm, most baytarnâmes (veterinary treatises) were written under the inspiration of Aristotle's Baytarnâme, eventually gaining an anonymous character. Tuhfetü'l-fârisîn fî-ahvâli huyûli'l-mücâhidîn, translated from an Arabic work by Tayyarzâde Ata, is also one such treatise. *https://www.zdergisi.istanbul/media/magazines/pdf/Baytarnameler.pdf*

The Establishment of Formal Veterinary Services and Schools in the Ottoman Empire

Scientific veterinary education in Istanbul began in 1842 under Sultan Abdülmecit, with the founding of a Military Veterinary School led by Prussian veterinarian Godlewsky.[20,22] The curriculum included anatomy, pathology, pharmacology, and clinical practices. Organized veterinary services also stationed veterinarians regionally for inspections, disease prevention, and livestock care.[22]

Influential Figures in Ottoman Veterinary Medicine

- **Şerafeddin Sabuncuoğlu** (15th century): Often called the father of Turkish surgery, his *Kitab al-I'tibar* included sections on veterinary medicine, detailing surgical methods and anatomical illustrations.[23,24]
- **Mehmet Ali Bey** (late Ottoman period): Instrumental in establishing veterinary schools and modernizing curricula, ensuring integration of traditional and contemporary science[25,26] (Figure 4).

The Role of Veterinarians in the Military and Agricultural Sectors

Veterinarians were key to both military and agricultural frameworks. Horses formed the backbone of the Ottoman cavalry, requiring constant care to maintain readiness.[19,20] Livestock sustained the rural economy, and veterinarians prevented animal disease outbreaks, advised on breeding, and improved productivity.[20,21]

Figure 4. Veterinary Mehmet Ali Bey. Throughout his professional life, veterinary Mehmet Ali Bey fought against animal diseases and prepared reports on the measures to be taken in this struggle. In articles published in the journal Vasıta-i Servet, that he was the editor, the need for a civilian veterinary school was brought to the forefront. *https://veteriner.iuc.edu.tr/en/content/foundation-and-development/foundation-and-development*

Medicine in the Ottoman Empire: A Period of Transformation

The introduction of European veterinary knowledge into the Ottoman Empire marked a pivotal shift in the development of veterinary medicine.[1,2]. As the empire grappled with modernization and integration into the global economy, adopting European scientific advancements became critical. This exchange profoundly shaped veterinary practices, education, and the broader trajectory of veterinary science.

The 19th Century: Tanzimat Reforms and the European influence

The Tanzimat Reforms (1839–1876) aimed to modernize the military, education, and healthcare sectors.[3,4] Veterinary medicine was included: European scientific principles were incorporated into curricula, and schools/hospitals were established or revamped under Western guidance. European experts introduced advanced anatomy, pathology, and pharmacology techniques.[5,6] This collaboration improved public health and aligned the empire's practices with global standards. The reforms thus became a cornerstone for evolving veterinary medicine in the Ottoman Empire. European influence led to modernized veterinary schools[7,8] (Figure 5). Anatomy, pathology, pharmacol-

Figure 5. Veterinary school 1889. The first civilian Veterinary School which was established in 1889. It produced its first graduates in 1893. *http://vefader.org.tr/wp-content/uploads/2024/01/photo_2024-01-13_22-17-44-2.jpg*

Figure 6. Ankara University Veterinary Faculty Amphitheater (1933). Ankara University's Faculty of Veterinary Medicine preserves all the memories of the past with its historic amphitheater. *https://www.hurriyet.com.tr/yerel-haberler/ankara/tarih-kokan-fakulte-42113815*

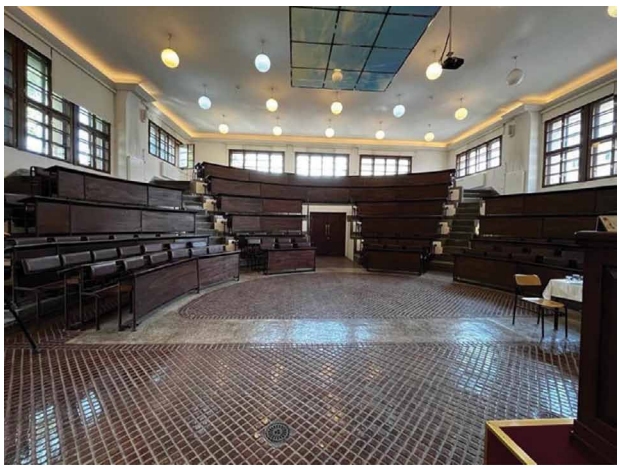


Figure 7. Ankara University Veterinary Faculty Amphitheater (today). Today, the Ankara University Amphitheater has been restored to its original condition.

ogy, and clinical practices were standardized, raising the quality of veterinary education. Diseases like rinderpest, anthrax, and glanders were better controlled through European diagnostic and management methods.[9,10]

4. The Early Republic Period (1923–1950s)

The Early Republic Period in Turkey, spanning from the establishment of the Republic in 1923 to the 1950s, was a transformative era marked by extensive reforms and modernization across various sectors, including veterinary medicine.[11,12] Guided by Mustafa Kemal Atatürk's vision for a modern, secular, and progressive Turkey, these reforms aimed to align the country with contemporary scientific and educational advancements. The importance of creating a secular and scientific educational framework to nurture skilled professionals in diverse fields was endorsed.[13,14] One of the most significant milestones in this process was the founding of the Veterinary Faculty at Ankara University in 1933, which became Turkey's primary center for veterinary education and research (Figure 6,7). Modeled after European veterinary schools, the Veterinary Faculty at Ankara University frequently invited experts from Europe to assist in curriculum development and teaching.[15,16] This alignment ensured Turkish students received an education comparable to international standards. The curriculum covered subjects such as animal anatomy, physiology, pathology, pharmacology, and clinical practices, with equal emphasis on theoretical knowledge and practical training.

Ord. Prof. Dr. Süreyya Tahsin Aygün: A Pioneer of Modern Veterinary Medicine in Turkey

Ord. Prof. Dr. Süreyya Tahsin Aygün (1895–1950) (Figure 8) was a leading figure in veterinary science during Turkey's Early Republic Period, significantly contributing to the modernization of veterinary practices and education under Mustafa Kemal Atatürk's vision.[17,18] Among his notable achievements were the development of the Turkish Universal Anthrax Vaccine, a resistant dry rinderpest vaccine, and early stem cell research, making him one of the pioneering scientists in this field. He retired from the army as a Brigadier General in 1950 but continued to serve as a faculty member in the Veterinary Faculty. Aygün famously declined the entry of thalidomide into Turkey, a drug later discovered to cause birth defects in pregnant women.[19] This decision likely prevented numerous congenital anomalies and stands as an

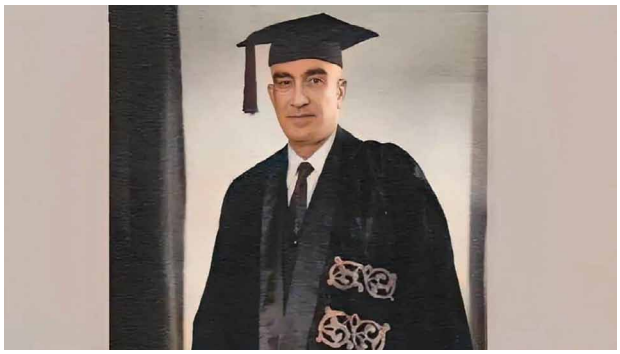


Figure 8. Süreyya Tahsin Aygün. He is known for discovering that the drug containing the active ingredient thalidomide, used to prevent various skin diseases, affects brain development in embryos, resulting in children being born with phocomelia. Aygün prevented its entry into the country. *https://cuneytyardimci.com/sureyya-tahsin-aygun-u-tanimiyor-olmanin-ayibi-hepimize-yeter/*

example of his cautious and research-based approach to new treatments.

Veterinary Infrastructure and Regulations

During the Early Republic, nationwide veterinary services expanded.[20,21] These services fostered public health, disease control, and agricultural productivity. Regional offices conducted inspections and developed vaccines,[22,23] improving diagnostic capacities, reducing disease prevalence, and boosting food security.[24,25]

Expansion of Veterinary Education (1960s–1990s)

Multiple faculties arose in Istanbul, Elazığ, and Bursa.[26,27] Specialized programs in pathology, microbiology, and parasitology kept pace with biotechnological advances. Research centers (Pendik, Etlik) (Figure 9) offered diagnostic and vaccine development services.[28,29] Technological innovations like PCR testing aided disease detection.[30,31] Modern surgical methods (laser, laparoscopy, arthroscopy) improved outcomes.[32,33]

Figure 9. The building of the Pendik Veterinary Control Institute at the time of establishment. *https://vetkontrol.tarimorman.gov.tr/pendik/Sayfalar/Detay.aspx?SayfaId=45*

Advancements in the Veterinary Pharmaceutical Industry

The roots of modern veterinary pharmacology date to 1842 with the establishment of a Veterinary School.[34,35] By 1940, the first law regulating veterinary drugs was enacted, and domestic veterinary drug production increased.[36,37] This accelerated disease management and preventive care. The first regulatory framework mandated written prescriptions for veterinary drugs. During the Republic Period, the production of the first veterinary drug, Distophagine, by Mehmet Halit (Civelekoglu) Bey in 1926 marked the start of the veterinary pharmaceutical industry. By 1938, the first domestic and imported veterinary drug licenses were approved.

Role of Veterinary Medicine in Economic Development

Veterinary interventions raised yields in livestock and poultry. Effective disease control measures like vaccination reduced mortality. Exports rose, and value-added animal products gained prominence. Veterinary medicine was essential to the growth of livestock and poultry industries. Better animal health and productivity increased yields of meat, milk, eggs, and other products, while veterinarians offered services such as disease prevention, reproductive management, and nutritional guidance.[38,39] Effective disease control measures—vaccination programs, parasite control, and biosecurity practices—reduced mortality and morbidity in livestock, supporting both domestic markets and exports of high-quality animal products.

Major epidemics (e.g., Foot-and-Mouth Disease) were tackled with culling, vaccination, and research. Foot-and-Mouth Disease (FMD) was a major concern, causing economic losses in the livestock industry.[40,41] Veterinary authorities implemented vaccination programs, movement restrictions, and culling of infected animals, while researchers focused on more effective vaccines and rapid diagnostic tests. Rinderpest was managed with intensive vaccination and surveillance campaigns until its global eradication in 2011, to which Turkey contributed. Brucellosis, tuberculosis, and Newcastle Disease in poultry were also key issues addressed through testing, vaccination, and biosecurity measures.

Conclusion

The history of veterinary medicine in Turkey reflects a rich legacy of progress and innovation, evolving through distinct eras that have shaped the field into its modern form.[42] Initially focused on practical

treatments for animals essential to agriculture and transport, veterinary care found formal structure during the Ottoman Empire through schools, regulations, and standards. The infusion of European knowledge in the 19th century introduced modern education and diagnostics. Under Mustafa Kemal Atatürk's leadership, transformative reforms laid the foundation for today's veterinary institutions and public health strategies. From its foundational roots to pioneering contemporary practices, Turkey's veterinary history stands as a testament to adaptation, collaboration, and a commitment to public health, food security, and animal welfare.

ΠΕΡΙΛΗΨΗ

Η Εξέλιξη της Κτηνιατρικής στην Τουρκία: Από τους Αρχαίους Πολιτισμούς στο Παρόν

Şahin, Elif1

Η κτηνιατρική, ο κλάδος της ιατρικής που ασχολείται με την πρόληψη, τη διάγνωση και τη θεραπεία ασθενειών στα ζώα, έχει μια πλούσια και πολυδιάστατη ιστορία. Η κατανόηση της εξέλιξης των κτηνιατρικών πρακτικών είναι κρίσιμη για την εκτίμηση των προόδων και των προκλήσεων που αντιμετωπίζει ο τομέας. Στην Τουρκία, η ιστορία της κτηνιατρικής είναι άρρηκτα συνδεδεμένη με τις πολιτιστικές, πολιτικές και οικονομικές μεταμορφώσεις της χώρας. Το παρόν άρθρο στοχεύει να διερευνήσει την ανάπτυξη της κτηνιατρικής στην Τουρκία, αναδεικνύοντας σημαντικές περιόδους, προσωπικότητες και συνεισφορές που διαμόρφωσαν την πορεία της. Συνεπώς, η ιστορία της κτηνιατρικής στην Τουρκία χαρακτηρίζεται από σημαντικές προόδους και συνεισφορές σε διάφορες εποχές. Από τις πρώτες πρακτικές των αρχαίων πολιτισμών έως την ενσωμάτωση των ιατρικών γνώσεων του Ισλάμ και τις προσπάθειες εκσυγχρονισμού κατά την Οθωμανική Αυτοκρατορία, κάθε περίοδος έχτισε πάνω στις προηγούμενες. Η περίοδος της Πρώιμης Δημοκρατίας υπό τον Μουσταφά Κεμάλ Ατατούρκ έθεσε ισχυρά θεμέλια για τη σύγχρονη κτηνιατρική εκπαίδευση και πρακτική. Το μέσο και τέλος του 20ού αιώνα σημείωσαν περαιτέρω προόδους στην τεχνολογία και τις υποδομές, οδηγώντας σε σημαντικές βελτιώσεις στην υγεία και την παραγωγικότητα των ζώων. Οι Τούρκοι κτηνίατροι συνεχίζουν να συμβάλλουν καθοριστικά στη δημόσια υγεία, την ασφάλεια των τροφίμων και τη διατήρηση της άγριας ζωής, αντιμετωπίζοντας παράλληλα νέες προκλήσεις και αξιοποιώντας ευκαιρίες για καινοτομία και παγκόσμια συνεργασία.

Λέξεις Κλειδιά: *Ιστορία της κτηνιατρικής, Ανατολία, Τουρκία*

REFERENCES

1. Demirel S. Some Remarks About The Summer Perıod In Hıttıte Anatolıa. Tarih İncelemeleri Dergisi. 2017;XXXII(2):391–405.
2. Pişkin E, Köksal S, Durdu G. Animal husbandry, isotopes, and land use at the Late Bronze Age Hittite city of Şapinuva (Šapinuwa), Turkey: insights from strontium isotopes. Archaeological and Anthropological Sciences. 2023;15:65. doi: 10.1007/s12520-023-01759-8
3. Başağaç Gül RT. Baitars and Early Veterinary Practices in Turkey c.1500–1800 [conference presentation]. ESF Exploratory Workshop on Early Modern Veterinary Beliefs and Practices in Europe c. 1500–1800; 2010 Dec; Winchester, UK [accessed 2024 Sep 05]. Available from: https://www.researchgate.net/publication/341106757_Baitars_and_Early_Veterinary_Practices_in_Turkey_c1500_-1800
4. Osmanağaoğlu Ş, Menteş Gürler A. Eski Anadolu ve Yakındoğu Uygarlıklarında Veteriner Hekimliği ve Hayvanlara İlişkin Yasal Düzenlemeler. Veteriner Bilimleri Dergisi. 2009;25(1–2):5–8.
5. Teletchea F. Animal Domestication: A Brief Overview. In: Animal Domestication. Chapter 1. [Internet]. InTechOpen; 2019. p. 1–21. Available from: http://dx.doi.org/10.5772/intechopen.86783
6. Spence IG. Historical Dictionary of Ancient Greek Warfare. Lanham (MD): Scarecrow Press; 2002.
7. Raepsaet G. Les soins vétérinaires à l'époque antique. In: Reverdin O, Wyss B, editors. Entretiens sur l'Antiquité Classique. Vandoeuvres: Fondation Hardt; 1993. p. 71–84.
8. McCabe A. A Byzantine encyclopaedia of horse medicine: the sources, compilation, and transmission of the Hippiatrica. Oxford: Oxford University Press; 2007.
9. Scarborough J. Pharmacy and drug lore in antiquity: Greece, Rome, Byzantium. London: Taylor & Francis; 2024. p. 138–74.
10. Mark JJ. A Brief History of Veterinary Medicine. World History Encyclopedia [Internet]. 2020 [cited 2024 Sep 05]. Available from: https://www.worldhistory.org/article/1549/a-brief-history-of-veterinary-medicine/
11. Nutton V. Ancient Medicine. 2nd ed. London: Routledge;

2013.
12. Lennox JG. The place of zoology in Aristotle's natural philosophy. In: Philosophy and the Sciences in Antiquity. London: Routledge; 2019. p. 55–71.
13. Aristotle. History of Animals. Translated by Peck AL. Loeb Classical Library. Cambridge (MA): Harvard University Press; 1965.
14. Xenophon. On Horsemanship and The Cavalry Commander. Translated by Willcock MM. Liverpool: Liverpool University Press; 1990.
15. White N. Horsemanship and Ethics in Xenophon. Greece & Rome. 1979;26(1):49–58.
16. [Duplicate of reference 15 omitted per user request to ignore duplicates]
17. Totelin LMV. Hippocratic Recipes: Oral and Written Transmission of Pharmacological Knowledge in Fifth- and Fourth-Century Greece. Leiden: Brill; 2009.
18. Franco NH. Animal experiments in biomedical research: a historical perspective. Animals. 2013;3(1):238–73.
19. Haldon JF. Byzantium in the Seventh Century: The Transformation of Culture. 2nd ed. Cambridge: Cambridge University Press; 1997.
20. [Duplicate of reference 8 (McCabe A) omitted per user request]
21. Magdalino P. The Empire of Manuel I Komnenos, 1143–1180. Cambridge: Cambridge University Press; 2002.
22. Anagnostakis I. Geoponika: Farm Work. A Modern Translation of the Roman and Byzantine Farming Handbook. [Internet]. 2012.
23. Magdalino P, Nelson RS, editors. The Old Testament in Byzantium. Vol. 2. Cambridge (MA): Harvard University Press; 2010.
24. Scarborough J. Pharmacy and Drug Lore in Antiquity. Pharmacy in History. 1976;18:115–26.
25. Kazhdan A. The Oxford Dictionary of Byzantium. New York: Oxford University Press; 1991.
26. Haldon J. Warfare, State and Society in the Byzantine World 565–1204. Abingdon (UK): Routledge; 2020.
27. Ropa A, Dawson TG. Echoing Hooves: Studies on Horses and Their Effects on Medieval Societies. Vol. 22. Leiden (Netherlands): Brill; 2022.
28. Fischer KD. Ancient Veterinary Medicine: A survey of Greek and Latin sources and some recent scholarship. Medizinhistorisches Journal. 1988;(3–4):191–209.
29. Rigg HM. Posturing Horses: Xenophon on Biomechanical Soundness in The Art of Horsemanship [master's thesis]. Waterloo (ON): University of Waterloo; 2022.
30. [Duplicate of reference 17 (Totelin LMV) omitted per user request]
31. Ay H, Ortadeveci A, Kucuk B, Ozden H. Stem Cell Studies of Professor Doctor Sureyya Tahsin Aygun. Osmangazi Journal of Medicine. 2024;46(4):656–65. doi: 10.20515/otd.1495919
32. Osmanağaoğlu Ş. Türk Tarihinde Veteriner Hekim Büyüklerimiz. Veteriner Hekim Derneği Dergisi. 2010;81(1):3–7.
33. Dinçer F. Ord. Prof. Dr. Süreyya Tahsin Aygün Hayatı Ve Bilimsel Çalışmaları. Fac Vet Med Ankara. 1982;29(1–2):256–76.
34. Çınar EN, Vatanoğlu-Lutz E. Ord. Prof. Dr. Süreyya Tahsin Aygün (1895–1981) Dünyada Kök Hücre Üzerine Çalışan İlk Bilim İnsanı. Nobel Medicus. 2014;13(3):55–8.
35. Sakarya E, Gökdai A, Sarıhan Şahin T. Livestock policies and read meat sector: Republic period and ensuing years. J Ist Vet Sci. 2019;3(3):64–74.
36. Howson ELA, Soldan A, Webster K, Beer M, Zientara S, Belák S, et al. Technological advances in veterinary diagnostics: opportunities to deploy rapid decentralised tests to detect pathogens affecting livestock. Rev Sci Tech Off Int Epiz. 2017;36(2):479–98. doi: 10.20506/rst.36.2.2668
37. Naniwadekar RG, Ghorpade VV, Goswami RA. Innovative Surgical Techniques in Veterinary Medicine: Enhancing Animal Health and Welfare. REDVET - Revista electrónica de Veterinaria. 2024;25(1):440–51.
38. Öztürk R. Türkiye'de Veteriner İlaç Sanayiinin Tarihsel Gelişimi. Vet Bil Derg. 2002;18(3):45–50.
39. Hamdi N. Distofajin Laboratuvarı. Ziraat Gazetesi. 1933;4(9–10–49):756–60.
40. Kelly AN. Veterinary medicine, global health. J Am Vet Med Assoc. 2007;231(12):1806–8.
41. Genç SV, Özgür A. The report of Prof. Ganslmayer to president Atatürk, about rinderpest and Turkish Veterinary Organization. MAE Vet Fak Derg. 2018;3(2):111–6.
42. İnci A, Doğanay M, Özdarendeli A, Düzlü Ö, Yıldırım A. Overview of Zoonotic Diseases in Turkey: The One Health Concept and Future Threats. Turkiye Parazitol Derg. 2018;42:39–80.

Corresponding author:
Elif ŞAHİN, İstanbul Yeni Yüzyıl Üniversitesi Faculty of Pharmacy, Department of Pharmacology, Zeytinburnu, İstanbul, Türkiye
Tel.: +90 505 677 79 25, e-mail: elif.sahin@yeniyuzyil.edu.tr