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The Current Role of Turkey (*Meleagris gallopavo*) Breeding in Poultry Production: Türkiye and World Perspectives

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Abstract

This study examines the current role of turkey (*M. gallopavo*) breeding from both Türkiye and world perspectives. Globally, turkey meat production holds significant importance, particularly in the United States and the Europe. While turkeys ranked fourth in the world poultry stock (with shares of ducks, geese, and turkeys at 5.95%, 1.98%, and 0.66%, respectively, in 2023), they ranked second in Türkiye's poultry stock, albeit with a lower share (with shares of turkeys, geese, ducks and guinea fowl at 0.90%, 0.36%, and 0.11%, respectively, in 2023). In Türkiye, certain provinces, especially Manisa, Bolu, and İzmir, stand out in terms of live turkey stocks. In 2024, Şırnak and Van garnered attention by entering the top fifteen provinces in terms of turkey stock. An examination of the import data over the past five years reveals that the maximum level of imports for turkey poults and eggs was achieved in 2020, amounting to approximately 2.9 million units. According to provisional data for 2024, turkey carcass weights have increased by approximately 1.5 kg compared to the previous year, reaching about 11.63 kg, indicating that Türkiye could enter the top ten in the world rankings for turkey carcass yield in 2024. However, over the past decade, per capita turkey meat consumption has not exceeded 1 kg, with 2023 consumption at just 0.557 kg.

Key Words: *M. g. gallopavo, turkey meat, turkey stocks, turkey carcass yield*

Hindi (*Meleagris gallopavo*) Yetiştiriciliğinin Kümes Hayvancılığı Üretimindeki Güncel Rolü: Türkiye ve Dünya Perspektifleri

Özet

Bu çalışma, hindi (*M. gallopavo*) yetiştiriciliğinin mevcut rolünü hem Türkiye hem de dünya perspektifinden incelemektedir. Küresel olarak hindi eti üretimi, özellikle Amerika Birleşik Devletleri ve Avrupa'da büyük önem taşımaktadır. Hindiler, dünya kanatlı hayvan varlığında dördüncü sırada yer alırken (2023 yılında ördeklerin payı %5,95, kazların payı %1,98 ve hindilerin payı %0,66'dır), Türkiye'nin kanatlı hayvan varlığında daha düşük bir payla da olsa ikinci sırada yer almaktadır (2023 yılında hindilerin payı %0,90, kazların payı %0,36 ve ördeklerin payı %0,11'dir). Türkiye'de Manisa, Bolu ve İzmir başta olmak üzere bazı iller canlı hindi varlığı açısından öne çıkmaktadır. 2024 yılında Şırnak ve Van, hindi varlığı bakımından ilk on beş il arasına girerek dikkat çekmiştir.

Son beş yıllık ithalat verileri incelendiğinde, hindi palazı ve yumurtası ithalatının en yüksek seviyeye 2020 yılında ulaştığı ve yaklaşık 2,9 milyon adet olduğu görülmektedir. Geçici verilere göre 2024 yılında hindi karkas ağırlığının bir önceki yıla göre yaklaşık 1,5 kg artarak yaklaşık 11,63 kg'a ulaşması, Türkiye'nin 2024 yılında hindi karkas randımanı açısından dünya sıralamasında ilk ona girebileceğine işaret etmektedir. Bununla birlikte, son on yılda kişi başına hindi eti tüketimi 1 kg'ı geçmemiştir ve 2023 tüketimi sadece 0,557 kg'dır.

Anahtar Kelimeler: *M. g. gallopavo, hindi eti, hindi varlığı, hindi karkas randımanı*

Introduction

The turkey (Meleagris gallopavo), a large bird, belongs to the class Aves, order Galliformes, family Phasianidae, and subfamily Meleagridinae. The recognized subspecies of wild turkeys include *Meleagris gallopavo sylvestris* (Eastern wild turkey), *Meleagris gallopavo aneusta* (Moore's), *Meleagris gallopavo merriami* (Merriam's), *Meleagris gallopavo mexicana* (Gould's), *Meleagris gallopavo gallopavo* (Mexican), *Meleagris gallopavo intermedia* (Rio Grande), and *Meleagris gallopavo asceola* (Shehata and Hafez 2024). The modern domestic turkey is presumed to be descended from the South Mexican wild turkey (*Meleagris gallopavo gallopavo*). The domestication process was initiated approximately 2500 years ago by the indigenous peoples of North America.

The turkey was introduced to Europe in the early 16th century, initially brought to Spain before spreading to other royal households across Europe. Its favorable economic and quality traits have made it a preferred source of meat across various geographic regions globally. Domestic turkeys are selectively bred to be larger than their wild counterparts for meat production (Kyselý and Meduna, 2019; Hristakieva, 2021).

The most pivotal developments in turkey production have occurred in the United States, the United Kingdom, and France. Until the end of World War II, turkeys in the America were historically raised with seasonal breeding and both natural and artificial incubation in free-range systems. The practice of artificial incubation, hybrid breeding, and artificial insemination has facilitated selective breeding aimed at enhancing animal performance and quality (Shehata and Hafez 2024). Turkey production, though smaller compared to broiler production, has seen significant growth since the 1980s, with increasing relevance in both the European Union and the United States (Marchewka et al, 2013). In response to consumer demand, the employment of intensive genetic selection techniques to accelerate growth rates and enhance meat yields has resulted in increased body weight and a higher proportion of breast meat (Hiscock et al., 2022). The breeds listed contain commercial and industrial strains, local types and breeds recognised in many countries. The American Standard of Perfection has identified eight distinct varieties: Beltsville Small White, Black Turkey, Bourbon Red, Bronze, Narragansett, Royal Palm, Slate, and White Holland. Modern domesticated turkeys have been developed through crossbreeding and linebreeding programmes and are recognised as a single breed with eight distinct varieties based on plumage colour (Dahal et al., 2024).

Currently, the leading global specialized breeding companies within the turkey industry include the Erich Wesjohann Group, based in Germany (Aviagen Turkeys), which oversees the B.U.T. and Nicholas lines, and Hendrix Genetics, headquartered in the Netherlands (Hybrid Turkeys), responsible for the Converter and Grade Maker lines. Additionally, these enterprises offer less fast-growing turkey lines, such as various strains from Aviagen Turkeys (Hockenhull Turkeys). Hendrix Genetics, along with the smaller breeding company Kelly Turkeys in the United Kingdom, also provides diverse slow-growing hybrids suitable for free-range production (Kelly Turkey Farms) (Shehata and Hafez 2024).

This study aims to provide a comprehensive overview of the current role and significance of turkey breeding, based on the most recent data, from both a national perspective within Türkiye and a global context.

Turkey breeding in the world

According to the most recently published 2023 data (Fao, 2024), the share of turkey stock in other poultry, its share in slaughtered poultry stock and its share in poultry meat production worldwide are shown in figures 1-3 respectively.

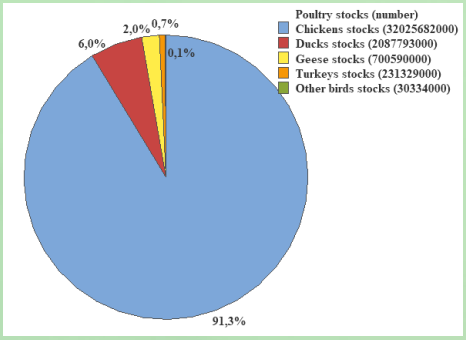


Figure 1. World poultry stock by species in 2023 (Fao, 2024)

In 2023, the world's poultry stock comprises chickens, ducks, geese, turkeys, and other poultry species, accounting for 91.3%, 5.95%, 1.98%, 0.66%, and 0.09%, respectively (Figure 1, Fao, 2024).

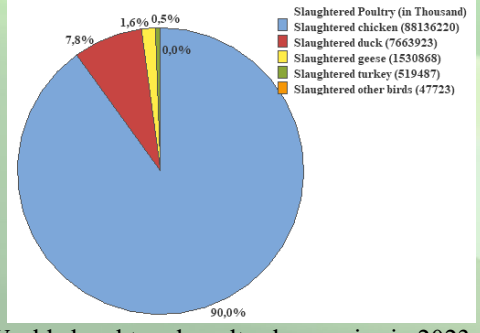


Figure 2. World slaughtered poultry by species in 2023 (Fao, 2024)

Figure 2 illustrates that in 2023, the world poultry slaughter data (expressed in thousands of poultry units) indicates that chickens constitute the highest percentage at 90.03%, followed by ducks at 7.83%, geese at 1.56%, and turkeys at 0.53%. Pigeons and other birds comprise a mere 0.05%, occupying the final position.

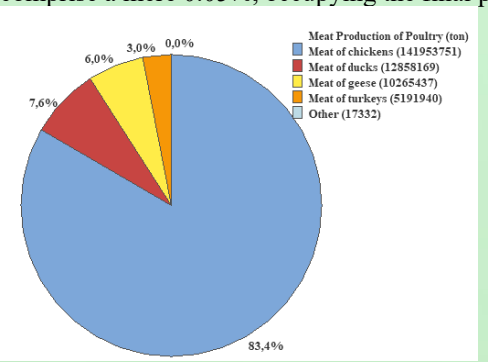


Figure 3. World poultry meat production by species in 2023 (Fao, 2024)

Figure 3 presents the production proportions of poultry meat by species in 2023. The respective percentages for chicken, duck, goose, turkey, pigeon and other birds are 83.36%, 7.55%, 6.03%, 3.05%, and 0.01%.

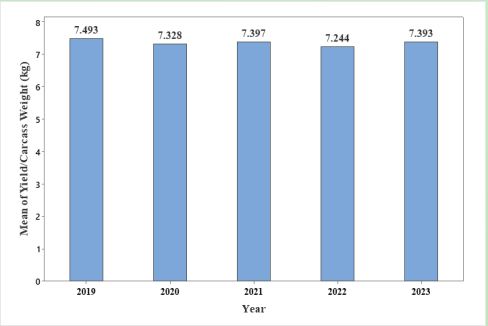


Figure 4. Mean turkey carcass weights in the world in the last five years (Fao, 2024)

Figure 4 presents the world means of turkey carcass weight over the past five years. Accordingly, the lowest average was recorded in 2022 at 7.244 kg, while the highest was in 2019 at 7.493 kg. Despite these values, there has been no significant numerical fluctuation in the world average over the last five years. On the other hand, Figure 5 shows the leading countries in terms of turkey carcass yield in each year of the last five years (2019-2023). According to this, China and/or China, Taiwan Province is quite high with values above 15 and ranked first every year.

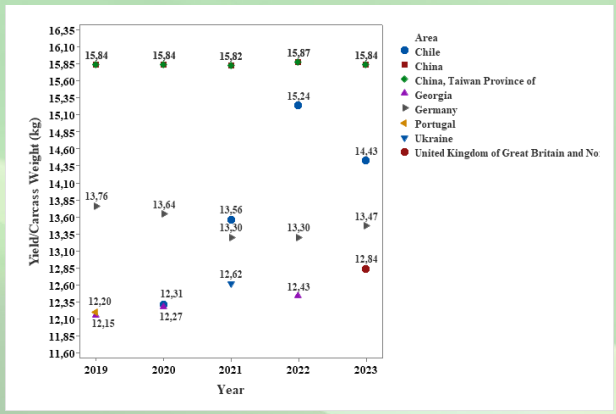
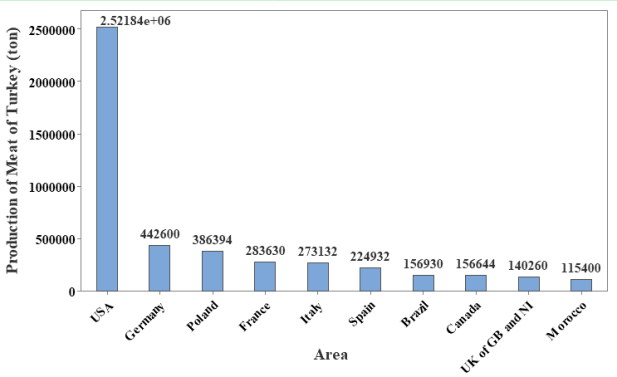


Figure 5. Leading five areas by turkey carcass yield in the last five years (alphabetically listed) (Fao, 2024)

Analyzing the average turkey meat production data from 2019 to 2023 (Figure 6) reveals that the United States of America holds a commanding lead. Following the USA, the top producers are Germany, Poland, France, Italy, Spain, Brazil, Canada, the United Kingdom of Great Britain and Northern Ireland, and Morocco, respectively.



Figures 6. Mean turkey meat production by leading 10 Areas: 2019-2023 (Fao, 2024)

Turkey breeding in Türkiye

Figure 7 presents the turkey stock in Türkiye for the years 2015-2024, along with the shares of other poultry species such as geese, ducks and guinea fowl, which may serve as alternatives to chickens. Despite turkeys ranking behind ducks and geese in the world stock (Figure 1), the proportion of turkey stock in Türkiye ranks second after chickens. While the proportion of turkeys within the poultry stock reached its highest level at 1.302% in 2019, the turkey stock achieved its maximum value (just under 4.8 million) within the last decade in 2020.

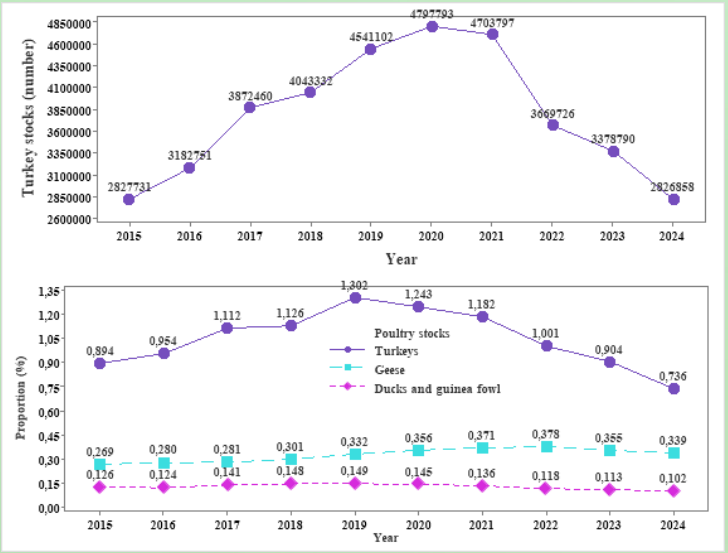


Figure 7. Turkey stock and its proportion within poultry in Türkiye (Tüik, 2024a)

Between 2015 and 2024, the top 15 provinces in terms of live turkey stocks accounted for 76.81%, 79.76%, 82.25%, 83.07%, 84.23%, 85.80%, 85.30%, 82.85%, 82.85%, 82.44%, and 82.46% of the total turkey stocks in these years, respectively (Figure 8, Tüik, 2024a). After 1995, utilizing the existing poultry farming knowledge, turkey farming has developed rapidly, especially in Bolu and İzmir due to the established poultry farming infrastructure (Koyubenbe and Konca, 2010). In the last decade, the live turkey stock in these provinces seems to have maintained its importance. And also, these four provinces, led by Manisa, Bolu, and İzmir, followed by Sakarya, are the leading provinces in terms of turkey stocks and have maintained their importance in the last decade. Except for the years 2018 and 2023, the highest turkey stock was in Manisa, while in these years, Bolu held the top position. In 2018, the proportional shares of Bolu and Manisa were 25.90% and 23.03%, and in 2023, they were very close at 27.70% and 27.64%, respectively. Additionally, in terms of live turkey stock, Şanlıurfa, Diyarbakır, and Muş consistently rank among the top fifteen provinces each year. These provinces represent the regions with the highest volumes of live turkey stocks across the country.

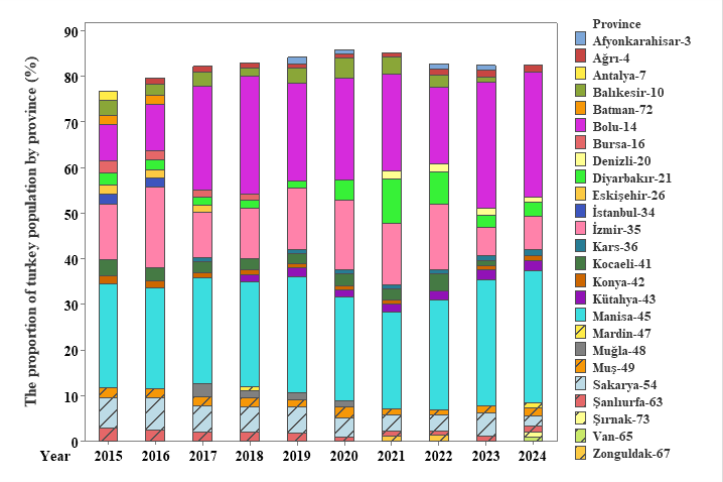


Figure 8. Leading 15 provinces by live turkey ratio over the past decade (alphabetically listed) (Tüik, 2024a)

When examining the provinces with the highest turkey stock ratios (Figure 8), it is observed that Bursa was included from 2015 to 2018, but not after 2019. Additionally, Eskişehir was included from 2015 to 2017, but not after 2018. Kocaeli was included from 2015 to 2023, but not in 2024. Balıkesir was included from 2015 to 2023, but its ranking gradually decreased, and it did not appear in 2024. Although Konya was often at the lower end of the top fifteen, it was included in every year except 2022. In 2024, Şırnak and Van entered the top fifteen for the first time. Although Mardin was in the top fifteen in 2018, it did not reappear until 2024, when it returned as one of the provinces with the highest turkey stock.

Table 1. Türkiye's turkey meat production and consumption (last decade) (Tüik, 2024a)

Year	Slaughtered turkey (thousand)	Turkey meat production (ton)	Yield/ Carcass weight (kg)[a]	Change in carcass yield (%)	Population of Türkiye	Turkey meat consumption per capita (kg)[b]	Chicken meat consumption per capita (kg)[b]
2015	5360	52723	9,836	-	78741053	0,670	24,247
2016	4664	46502	9,970	1,362	79814871	0,583	23,542
2017	5219	52363	10,033	0,632	80810525	0,648	26,441
2018	6780	69536	10,256	2,223	82003882	0,848	26,299
2019	6186	59639	9,641	-5,996	83154997	0,717	25,716
2020	6063	58211	9,601	-0,415	83614362	0,696	25,549
2021	5170	51301	9,923	3,354	84680273	0,606	26,520
2022	5593	53647	9,592	-3,336	85279553	0,629	28,353
2023	4681	47575	10,163	5,953	85372377	0,557	27,278
2024*	3508	40805	11,632	14,454	85664944	-	29,325

*: For the year 2024, data for the last three months of the year are not available, a: Yield or Carcass weight was found by dividing the turkey meat by the number of slaughtered turkeys, b: Per capita consumption is calculated by dividing the total produced meat by the population.

Table 2. Imports of turkey breeder poults and eggs in Türkiye in the last five years (number)

Year	Turkey poults; weight ≤ 185g, breeding stock	Turkey eggs; hatchery, breeding stock	Turkey eggs; hatchery, non-breeding stock	Total turkey egg imports
2020	49075	109200	2804400	2913600
2021	-	160516	1970200	2130716
2022	60830	-	1580400	1580400
2023	82070	-	250000	250000
2024*	66021	-	1909600	1909600

*: Data for 2024 is provisional, (Tüik, 2024b)

Considering that turkeys start laying at about eight months (Özlü et al., 2015), six months laying period (between 31 and 56 weeks of age of the turkey) (Filiz, 2024) and reach slaughter age at about four months (Sipahi and Cevger, 2021), the increase in turkey carcass weight in 2024 (Table 1) can be attributed to increased imports of turkey chicks and eggs in 2022 and 2023. Imported breeding flocks may grow faster, be more productive and have

better nutrition and care than in previous years. However, an examination of the egg import data for the last five years shows that there is no dramatic increase in 2022 and 2023 (Table 2), at least in terms of numbers, and even a numerical decrease until 2023, while turkey poult stocks imports increase in 2023. This increase in carcass yield can be attributed to the use of high-performance genotypes and improved feeding and environmental conditions. On the other hand, turkey carcasses exhibit significant variations based on breed, gender, genetic selection, breeding system, age at slaughter, pre-slaughter treatment (Fry et al., 1962; Çelik et al., 2018). Therefore, the turkey varieties preferred in breeding in 2024 may have exhibited higher performance in terms of carcass yield or longer fattening periods compared to previous years.

In terms of turkey carcass yield, Türkiye has progressively risen in the world rankings from 2019 to 2023, occupying the 23rd, 21st, 17th, 18th, and 16th positions, respectively (Fao, 2024). As shown in Table 1, the carcass yield in 2024 increased by 14.45% compared to the previous year, amounting to approximately 1,5 kg. Consequently, it is projected that Türkiye could enter the top 15 in the world rankings for carcass yield in 2024.

Per capita turkey meat consumption has not even exceeded 1 kg in the last decade. In 2023, per capita turkey meat consumption was only 0.557 kg, whereas chicken meat consumption was approximately 49 times higher, with 27.278 kg consumed per capita (Table 1).

Conclusion

Among poultry species, turkeys have the potential to become a significant meat production sector globally in certain regions. The increase in turkey carcass weight in Türkiye may have been achieved through the application of advanced breeds and modern breeding methods. These advancements suggest that turkey meat production may continue to rise in the future. However, per capita turkey meat consumption in Türkiye remains at low levels.

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