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Global tendencies in turkey meat production, trade and consumption

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SUMMARY

Global meat production totaled 357 million metric tons in 2021. Poultry accounted for nearly 40 percent of total meat production, including 4.2 percent of turkey meat (5.8 million tons). Global turkey meat production has stagnated between 5.5 and 6.0 million tons since 2008, in contrast to the monotonous upward trend in poultry meat production. Turkey meat production generally occurs under well-integrated conditions, with some large multinational companies and smaller, regional players. The industry is exposed to a number of factors that affect supply and demand, including disease outbreaks, government regulations, consumer preferences, and economic conditions. Key factors driving market growth include population growth, urbanisation, and increasing consumer awareness of the health benefits of turkey meat over other meats. In addition, advances in processing, packaging, and distribution technology have improved turkey meat's shelf life and availability, further fueling growth. Turkey farming and production are mainly concentrated in certain regions such as North America and Europe, where industrialisation has a long history and infrastructure is well developed. Turkey meat production in these areas is sufficient to meet local demand and is often exported to other regions. However, in other regions where turkey farming is less developed, such as parts of Asia and Africa, turkey meat production is insufficient to meet local demand. This type of meat must be imported from other regions. The degree of self-sufficiency in turkey meat depends on the level of development of the sector in each region. This study investigates the factors affecting global and regional markets for turkey meat and systematised the development of global consumption, production, and trade of turkey meat.

Keywords: *market situation; poultry meat; turkey meat; challenges*

INTRODUCTION

In recent years, a number of scientific publications have appeared presenting trends in individual livestock sectors (Pig: Szűcs et al., 2017; Carp: Karnai et al., 2018; Eggs: Szőllősi, 2021; Dairy cattle: Bojovic, 2023). These analyzes are also useful for market participants and decision-makers. This article aims to expand the scope of this literature by focusing on turkey meat. Domestication of the turkey began around 1800 BC in southern Mexico and around 200 in the southwestern United States (Speller et al., 2010). Since then, turkey domestication has changed significantly. Beginning in the 1940s, advances in breeding (including artificial insemination), feeding, and management practices led to higher productivity and lower costs for turkey farmers, making turkey meat more affordable for consumers (Lasley et al., 1985; Brant, 1998; Mohan et al., 2018). The FAO's first global data collection in 1961 showed that turkey meat production was 898,000 tons. By 2020, that amount had increased to nearly 6 million tons. This growth can be attributed to favorable production factors such as the development of the genetic and feed industries, a high degree of integration, and closed housing systems. In addition, consumer preferences have changed. Turkey meat has a high protein content, is not prohibited by religious customs, is part of the Thanksgiving tradition, and can be easily integrated into any diet. The market situation of the turkey meat sector is characterised by high nominal output prices, supported on the demand side by increasing revenues from developing countries, and on the supply side by high input costs, especially for feed grains, energy-related expenses, and labor. Turkey meat is versatile as it contains both white and red meat, making it a suitable substitute for other meat products. Its unique flavor profile (Herkel et al., 2016) and high nutritional value make it a good component of a health-conscious diet, as it is rich in micronutrients such as selenium, phosphorus, potassium, magnesium, zinc, and iron (Canadian Turkey, 2022). These nutrients have beneficial effects on the human immune and nervous systems (Riccardi et al., 2020). In developed countries, turkey meat is an everyday part of gastronomy. The study's main objective is to present, in a comparable manner, the production, trade, and consumption of turkey meat in various countries around the world.

MATERIALS AND METHODS

This publication contains tables, figures, and explanatory notes on the breakdown: production, trade (export and import data) and consumption. The study examines the role of turkey meat in different countries of the world. The study aims to examine the changes in the production, trade, and consumption of turkey meat between 2011 and 2021. Various databases were used to illustrate and describe turkey meat production, trade, and consumption (Food and Agriculture Organization of the United Nations) reports were used to illustrate the world market for turkey meat. Since the FAO database does not contain enough information on Russia, data from ROSSTAT (Russia Federal State Statistics Service) were also used, that data gathered by Agrifood Strategies reports. Supporting details such as statistics, market trends, and industry practices will be included to provide a comprehensive overview of the topic. The tables and graphs in this publication were

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prepared based on the above publications and databases.

RESULTS AND DISCUSSION

Turkey meat production was 6.1 million tons in 2021, accounting for 4% of the global poultry meat and 1.6% of the world's meat supply (FAO, 2023; ROSSTAT, 2023). The TOP-15 countries play the most important role in global turkey meat production. *Table 1* shows turkey meat production in these countries in 2011 and 2021.

Table 1. **World turkey meat production changes by countries (2011–2021)**

Countries		2011 (tons)	2021 (tons)	Distribution in 2021	% Change (2011–2021)
1	USA	2 626 527	2 526 579	40.9%	96%
2	Brazil	489 000	572 603	9.3%	117%
3	Germany	467 354	441 000	7.1%	94%
4	Russia Federation	56 000	400 133	6.5%	714%
5	Poland	100 000	363 150	5.9%	363%
6	Italy	309 483	297 830	4.8%	96%
7	France	398 082	295 000	4.8%	74%
8	Spain	149 317	224 840	3.6%	151%
9	Canada	159 210	158 869	2.6%	100%
10	United Kingdom	171 000	128 800	2.1%	75%
11	Morocco	80 000	115 000	1.9%	144%
12	Tunisia	42 000	88 700	1.4%	211%
13	Israel	90 000	85 700	1.4%	95%
14	Hungary	82 988	73 330	1.2%	88%
15	Chile	94 953	71 614	1.2%	75%
	Rest of the world	**296 777**	**332 352**	**5.4%**	**122%**
	World	**5 612 691**	**6 175 501**	**100.0%**	**110%**

Source: own editing based on the database of FAOSTAT, ROSSTAT (FAO, 2023; ROSSTAT, 2023)

As shown in *Table 1*, the TOP-15 countries account for 95% of global turkey meat production in 2021, with the United States remaining the largest producer with 2.5 million tons or 42% of global production. The concentration of production shows that the second largest producer, Brazil, has a quarter of the production, while the U.S. and Brazil account for half of the world's production. The production of turkey meat has traditionally been associated with American continent. The domestication of the turkey occurred in this region and the genetic base of intensive turkey meat production is also on this continent, with one of the largest genetic bases in Canada (Hendrix Genetics). Production is typically found in developed countries. This is due to the fact that mass production requires a system of stabling, genetic and feed industry developments, a high level of integration, and a high level of corporate governance.

In recent years, the global landscape of turkey production has undergone significant changes due to various geopolitical circumstances and economic policies. One notable outcome of these changes is the drastic growth in turkey production in Russia and Poland within the last decade. If we take a closer look at *Figure 1*, we can see that Russia's monotonously increasing production increased by an average of 71 percent annually. The EU meat embargo against Russia since 2014 and Russia's subsequent import substitution program have accelerated Russia's self-sufficiency process and led to a record increase in production. The Russian Federation has increased the production of turkey meat to 400 thousand tons by 2021. The turkey industry in the Russian Federation faces a major challenge due to the lack of domestic breeding stock. To solve this problem, the industry relies on importing day-old chicks and hatching eggs from EU countries and Canada via Moscow. However, this leads to increased transportation and logistics costs, which ultimately increase the cost of the final product. Despite this challenge, turkey production in the Russian Federation is expected to increase. This is due to the large volumes of hatching eggs and day-old chicks imported from the EU, which are not covered by the Russian Federation's counter-sanction embargo against Western countries (Askerov, 2021).

Another trend can be observed in the European Union countries. France, the United Kingdom, and Germany have also seen a decline in production. The reason for this can be attributed to several factors. One of these factors is the tightening of animal welfare regulations. The European Union has enacted several animal welfare regulations, one of which is the tightening of animal welfare standards for turkey meat producers. As a result, raising and breeding turkeys means increasingly higher costs for producers. Finally, cheaper imported turkey meat has a negative impact on the market position of turkey meat producers, as the prices of imported products can be more competitive than those of domestic producers. At the same time, turkey meat production has increased significantly in

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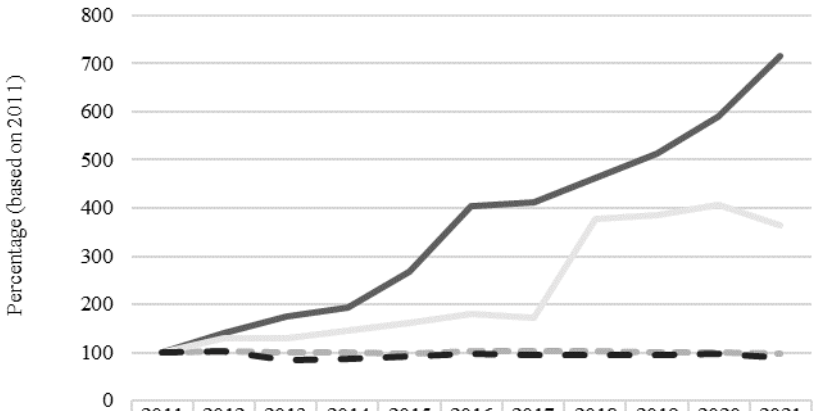
Poland and Spain. The reason is that production in these countries is more competitive thanks to cost-effective production, the labor costs are lower, and unlike in Western European countries, intensive animal livestock farming is more widely accepted.

Figure 1. **Changes in turkey meat production in some countries**



	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Russian Federation	100.0	139.3	175.0	194.6	267.5	404.3	412.7	462.7	514.4	589.3	714.5
USA	100.0	103.1	100.3	99.4	97.2	103.3	103.3	101.5	100.7	99.4	96.2
Poland	100.0	129.0	128.5	145.0	162.4	179.1	172.2	376.6	385.6	406.8	363.2
Hungary	100.0	101.7	84.4	85.6	92.6	98.2	94.3	95.6	94.3	97.3	88.4

Source: own editing based on the database of FAOSTAT, ROSSTAT (FAO, 2023; ROSSTAT, 2023)

Global turkey meat export has slowed down in this period, exports in 2021 were 890 thousand tons, a decrease of 7% compared to 2011. As shown in *Table 2*, the TOP-15 countries account for 94% of global turkey meat export in 2021.

Table 2. **World turkey meat export changes by countries (2011–2021)**

Countries		2011 (tons)	2021 (tons)	Distribution in 2021	% Change (2011–2021)
1	USA	294 218	216 151	24%	73%
2	Poland	102 297	153 825	17%	150%
3	Germany	91 689	96 641	11%	105%
4	Italy	55 877	58 902	7%	105%
5	Spain	18 300	52 768	6%	288%
6	France	95 064	50 302	6%	53%
7	Brazil	72 661	41 846	5%	58%
8	Hungary	38 027	34 330	4%	90%
9	Netherlands	52 588	27 414	3%	52%
10	Canada	22 118	26 574	3%	120%
11	Chile	17 307	22 496	3%	130%
12	Russian Federation	-	21 503	2%	–
13	Belgium	5 248	15 425	2%	294%
14	United Kingdom	35 550	11 468	1%	32%
15	Austria	15 582	8 763	1%	56%
	Rest of the world	**56 595**	**49 802**	**6%**	**88%**
	World	**973 121**	**888 211**	**100%**	**91%**

Source: own editing based on the database of FAOSTAT, ROSSTAT (FAO, 2023; ROSSTAT, 2023)

The decrease can be explained in part by the impact of COVID-19 and in part by export restrictions due to the HPAI (Highly Pathogenic Avian Influenza) virus (Çakır et al., 2017; Austin, 2021). Due to the EU meat embargo, earlier exports to Russia were also halted, further reducing global demand. The COVID-19 epidemic and associated restrictions had a significant impact on the food industry, including exports of turkey meat. Due to the closure or reduced capacity of hotels, restaurants, and other food service establishments (HORECA), demand dropped to lower than usual levels. Transportation and logistics chains were

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disrupted, and the transport and processing of animals also encountered difficulties, which also affected prices. HPAI (highly pathogenic avian influenza) also hurts the poultry industry, including turkey exports. When animal health authorities detect the presence of the HPAI virus, immediate measures are taken to prevent the spread of the virus. These measures typically include immediate culling of infected animals and quarantine of infected areas. However, such restrictions can have a significant impact on the export of turkey meat, as meat from affected areas is usually not allowed to be marketed. HPAI typically spreads in the cold regions of the Northern Hemisphere. In recent years, there have been significant outbreaks of HPAI in Asia, Europe, North America, and Africa. The poultry industry in the United States has been particularly affected by HPAI, losing a significant amount of exports due to the outbreaks.

Among the largest turkey exporters, the United States (216 thousand tons) can be mentioned, followed by Poland (153 thousand tons) and Germany (96 thousand tons). Over the past decade, many countries have reduced turkey meat exports, including the world leaders USA (-27%), France (-47%), and Brazil (-42%). At the same time, several countries achieved a significant increase in turkey meat exports. Among these countries, Poland (+50%), Spain (+188%) and Belgium (+194%) stand out as the most notable examples in the period between 2011 and 2021. Russia has reached the level of self-sufficiency in turkey meat and has emerged in export markets, with its main target countries being China and Ukraine.

According to the FAO, in 2011 the world's turkey meat import was 894 thousand tons, while in 2021 it was 890 thousand tons (*Table 3*). The number of countries consuming turkey meat has increased over the period studied: in 2011, 138 countries purchased turkey meat; in 2021, 173 countries did so.

Table 3. **World turkey meat import changes by countries (2011–2021)**

Countries		2011 (tons)	2021 (tons)	Distribution in 2021	% Change (2011–2021)
1	Mexico	150 572	154 622	17%	103%
2	Germany	104 004	95 939	11%	92%
3	Benin	47 612	50 678	6%	106%
4	Spain	25 929	34 480	4%	133%
5	France	27 426	31 635	4%	115%
6	Belgium	35 702	31 438	4%	88%
7	Netherlands	32 768	27 432	3%	84%
8	Austria	37 611	26 249	3%	70%
9	South Africa	24 228	25 278	3%	104%
10	United Kingdom	26 207	23 746	3%	91%
11	Portugal	14 887	22 782	3%	153%
12	Romania	12 280	22 140	2%	180%
13	China	34 365	19 614	2%	57%
14	Czech Republic	8 052	18 418	2%	229%
15	Poland	12 287	17 274	2%	141%
	Rest of the world	**300 983**	**288 604**	**32%**	**96%**
	World	**894 913**	**890 329**	**100%**	**99%**

Source: own editing based on the database of FAOSTAT, ROSSTAT (FAO, 2023; ROSSTAT, 2023)

The largest importer is Mexico (150 thousand tons). In Western European countries, imports generally decreased (Germany -8%; Belgium -12%; Austria -30%), while Spain (+33%), Portugal (+153%) Czech Republic (+129%), and Romania (+80%) increased their imports. It is important to note that re-exports cannot be detected from the FAO database.

Having analyzed turkey meat production and trade, we can now turn to turkey meat consumption. *Table 4* shows total global meat consumption by meat type. Poultry is the most consumed meat in the world. The available data was the latest for 2020. Pork used to be the most popular meat: estimates in 2015 show that consumption of both types of meat was almost equal. The third most popular type of meat is bovine meat, which accounts for almost half the consumption of poultry. Consumption of sheep meat is very low, around 2 kg capita^{-1} year^{-1}. Based on available data, estimated the per capita consumption of each type of poultry. Traditionally, chicken meat (14.4 capita^{-1} year^{-1}) is the most popular poultry meat. Duck meat is characterised by dynamic growth, but the impact of avian flu on demand is being felt. The consumption of turkey meat has remained stable on average over the last ten years (in 2020 was 0.73 capita^{-1} year^{-1}).

Estimated the per capita consumption of turkey meat based on the production, import, export, and population of the countries (per capita consumption = (production + import) - export) / population). In the case of *Table 5*, it is important to note that the list was further refined by deleting small countries (under 300,000 inhabitants).

DOI: 10.34101/ACTAAGRAR/2/12594

Table 4. **World meat consumption (2011–2020) (**capita^{-1} year^{-1}**)**

	Bovine Meat	Mutton & Goat Meat	Pig meat	Eggs	Poultry meat	Chicken meat	Duck meat	Turkey meat	Goose meat
2011	9.18	1.80	15.22	8.84	14.40	12.67	0.59	0.78	0.36
2012	9.11	1.86	15.19	8.92	14.45	12.71	0.59	0.79	0.37
2013	9.10	1.91	15.22	9.03	14.70	13.01	0.58	0.75	0.36
2014	9.08	1.98	15.05	9.08	14.91	13.24	0.57	0.75	0.35
2015	8.91	1.99	15.23	9.26	15.23	13.55	0.58	0.75	0.35
2016	8.84	2.01	15.30	9.42	15.37	13.66	0.57	0.78	0.36
2017	8.84	1.99	15.37	9.74	15.53	13.89	0.54	0.74	0.35
2018	9.02	1.98	15.63	9.90	15.79	14.10	0.57	0.75	0.37
2019	9.07	1.95	14.97	10.32	16.47	14.45	0.76	0.75	0.52
2020	9.09	1.98	14.62	10.45	16.40	14.40	0.74	0.73	0.53

Source: own editing based on the database of FAOSTAT (FAO, 2023)

Table 5. **Turkey meat consumption by countries (2021)**

	Countries	2011 (kg/head)	2021 (kg/head)	% Change (2011–2021)
1	Israel	11.41	9.56	84%
2	Qatar	10.39	6.97	67%
3	United States of America	8.40	6.95	83%
4	Germany	5.89	5.75	98%
5	Bahamas	5.99	5.55	93%
6	Hungary	5.21	5.34	102%
7	Portugal	5.00	5.14	103%
8	France	5.26	5.12	97%
9	Ireland	5.59	5.09	91%
10	Italy	4.39	4.45	101%
11	Gabon	5.65	4.27	76%
12	Chile	4.76	4.19	88%
13	Slovenia	3.94	3.84	97%
14	Canada	4.08	3.67	90%
15	Benin	4.90	3.66	75%
	Word average	**0.78**	**0.73**	**94%**

Source: own editing based on the database of FAOSTAT (FAO, 2023)

Taking a closer look at *Table 5*, it can be seen that, among the TOP15 countries, there are also many countries where religious customs prohibit the consumption of pork: It is a popular dish among Jewish and Muslim countries. Festive customs also promote the consumption of turkey meat seasonally. Thanksgiving is a North American holiday, and turkey is an essential ingredient. In European countries, eating turkey at Christmas is typical. In general, turkey meat is rich in nutrients and low in fat and it is a good source of protein. Therefore, it is a popular food among health-conscious consumers. (Marangoni et al., 2015) It is easy to process, which is why it is a popular ingredient in the HORECA sector, where pre-made meals are preferred. According to recent research, turkey meat is suitable for the production of novel culinary products (Khatko, 2022).

The global poultry industry, including the turkey sector, faces several challenges related to social impact, environmental impact, economic impact, and animal health. *Table 6* summarizes the current challenges facing the sector.

Table 6. **Current challenges for turkey sector**

Social impacts	Environmental impacts	Economic impacts	Animal health
• Consumer behavior changes • Labor shortage • Animal welfare	• Climate change • Sustainable use of natural resources	• Production efficiency • Import restrictions • Input price increase	• Highly pathogenic avian influenza (HPAI) • Antibiotic usage • Feed quality

Source: own edition

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As the world's population continues to grow, so does the demand for food, including poultry. The challenge for the poultry industry is to sustainably meet this growing demand while ensuring food security for all. Changing consumer preferences and behaviors, such as the trend toward plant-based diets, can impact demand for poultry products. Turkey meat production is affected by problems related to labor shortages and an aging society. Turkey meat production is a labor-intensive process that requires great expertise and care. Animal husbandry, especially large-scale animal husbandry, usually requires hard physical work and long hours. The age composition of those working in animal husbandry is generally higher, and it is difficult to attract younger age groups to the sector. Consumers are increasingly concerned about animal welfare and the ethical treatment of animals. The industry must ensure that poultry production meets high standards for animal welfare. This increases production costs. Import restrictions and trade barriers can affect the poultry industry's ability to access new markets and customers, resulting in reduced economic opportunities. Avian influenza outbreaks, particularly of the highly pathogenic strains, can have a significant impact on the poultry industry by causing substantial economic losses and weakening consumer confidence in poultry products. The use of antibiotics in poultry production can lead to the emergence of antibiotic-resistant bacteria, which can pose a threat to public health. The industry must find ways to reduce antibiotic use while maintaining high standards for animal health and welfare.

CONCLUSIONS

Thanks to technological and organizational innovations, intensive turkey meat production has developed rapidly over the past 60 years This growth is expected to be driven by the increasing demand for turkey meat, and technological advancements. However, examining the past 10 years, it can be concluded that global turkey meat production is stagnating, around 6 million tons. Production and trade were typically concentrated on the American continent, however, a reorganization can be observed in recent years. On a global level, Russia has appeared on the market, not just for self-sufficiency but also with export trades. There is also a reorganization in Europe, where the production is shifting from the West part of the EU to the East and the South. Turkey meat appears to be a promising product in the future, due to its favorable content value, the absence of religious prohibitions, and its culinary value.

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