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LARGE GAME MEAT PRODUCTION AND CONSUMPTION IN SERBIA

Jelena Petrović^{1*}, Jovan Mirčeta², Ivan Ludoški², Jasna Kureljušić³,
Jasna Prodanov Radulović¹, Miroslav Urošević⁴

¹Scientific Veterinary Institute "Novi Sad", Novi Sad, Republic of Serbia

²"Vojvodinašume", Petrovaradin, Republic of Serbia

³Scientific Veterinary Institute of Serbia, Belgrade, Republic of Serbia

⁴Faculty of Agriculture, University of Novi Sad, Novi Sad, Serbia

Abstract

Game meat has always been a part of the human diet. It is rich in protein and low in fat, and its consumption is increasing across Europe. The main objective of this paper is to enhance knowledge and understanding of large game meat production and consumption in Serbia. This study uses the official data provided by the Statistical Office of the Republic of Serbia to calculate average hunting ground size, game population density and harvest rate. Game meat production data were obtained from four large game meat processing facilities and used for calculation of game meat yield and consumption rate. Serbia has a relatively small number of hunters, yet hunting grounds are extensive, covering nearly 92.6% of the country's territory. Among large game species, roe deer constitute the most abundant population in Serbia. This population is characterized by medium size and density, with a relatively low harvest rate compared to other European countries. Wild boars are the most frequently hunted large game species in Serbia. Although their population density is low, it varies significantly across different hunting grounds, and the harvest rate remains high. The red deer population is comparable in size to that of neighboring countries, but has low density and a low harvest rate primarily due to ongoing population increase programs. The fallow deer population is steadily declining. Consumption rate, as well as game meat production Serbia is lower than in most European countries. A Serbian resident consumes as little as 0.120 kg of large game

* Corresponding Author: jelena@niv.ns.ac.rs

meat annually, accounting for just 0.3% of total meat consumption. These data represent the first quantitative data on game meat consumption in Serbia. Our findings suggest that there is significant potential to promote large game meat and boost its consumption in Serbia, especially considering the lower price of game meat – such as wild boars compared to domestic pork, and venison compared to beef.

Key words: venison, game meat, roe deer, red deer, wild boar, Serbia

PROIZVODNJA I KONZUMIRANJE MESA KRUPNE DIVLJAČI U SRBIJI

Jelena Petrović¹, Jovan Mirčeta², Ivan Ludoški², Jasna Kureljušić³,
Jasna Prodanov Radulović¹, Miroslav Urošević⁴

¹Naučni institut za veterinarstvo "Novi Sad", Novi Sad, Republika Srbija

²"Vojvodinašume", Petrovaradin, Republika Srbija

³Naučni institut za veterinarstvo Srbije, Beograd, Republika Srbija

⁴Poljoprivredni fakultet, Univerzitet u Beogradu, Zemun, Republika Srbija

Kratak sadržaj

Meso divljači je oduvek deo ishrane čoveka, bogato je proteinima, ima nizak sadržaj masti. U Evropi se zapaža trend porasta konzumiranja. Osnovni cilj ovog rada je unapređenje postojećeg znanja i razumevanja proizvodnje i konzumiranja mesa krupne divljači u Srbiji. U radu su korišćeni zvanični podaci Republičkog zavoda za statistiku Srbije za **izračunavanje prosečne veličine lovišta**, gustine populacije divljači i odstrela. Podaci o proizvodnji mesa divljači dobijeni iz **četiri** veća objekta za obradu mesa krupne divljači su korišćeni za izračunavanje prinosa mesa i konzumiranja mesa divljači. Srbiju odlikuje relativno mali broj lovaca, lovišta su velika i zauzimaju gotovo 92,6% teritorije države. Srne su najbrojnija populacija krupne divljači u Srbiji, populacija je srednje veličine i gustine u odnosu na ostale Evropske zemlje a udeo odstrela je nizak. Divlje svinje su najčešće lovljena vrsta krupne divljači u Srbiji, gustina populacije je niska ali značajno varira po lovištima dok je odstrel je visok. Veličina populacija običnog jelena je slična susednim zemljama, gustina je niska a zbog programa povećanja populacije odstrela je nizak. Populacija jelena lopatara stalno

opada, u nekim delovima Srbije je istrebljen. U odnosu na druge zemlje Evrope, Srbija je jedan od najmanjih proizvođača mesa krupne divljači, takođe količina mesa divljači koja se konzumira po glavi stanovnika je niska. Prosečan stanovnik Srbije pojede 0,120 kg mesa krupne divljač, što čini svega 0,3% ukupne potrošnje mesa. Ovo su prvi kvantitativni podaci o konzumiranju mesa divljači u Srbiji. Naši podaci ukazuju da postoji prostor za popularizaciju mesa krupne divljači i povećanje potrošnje u Srbiji, posebno treba uzeti u obzir *i nižu cenu mesa koje npr. imaju divlje svinje u odnosu na domaće svinje, kao i jelensko meso u odnosu na junetinu.*

Ključne reči: divljač, meso divljači, srna, jelen, divlja svinja, Srbija

INTRODUCTION

Hunting is among the oldest skills developed by humans, initially used as a means to obtain food. Today, hunting in Europe serves multiple purposes, including recreation, entertainment, trophy hunting, food supply, and the management of wild animal populations (Benko et al., 2020). Game meat has long been part of the human diet, once serving as a primary source of protein. Although its role in modern diets has diminished, there is a growing trend of increased game meat consumption in Europe. Game meat is high in quality protein, low in fat, and has optimal fatty acid composition (Harguess et al, 2020).

In Serbia, large game animals include wild boars, red deer, fallow deer, roe deer, chamois and European mouflon. These populations are managed through selective hunting (with age- and sex- specific quotes) significantly affected by population growth rates (Rivrud et al., 2014).

Wildlife management in Serbia follows a regal hunting system, in which game species are regarded as a natural resource owned by the state. This system is regarded as outdated in Europe (Lavadinović et al., 2017, Popović et al, 2023). The state allocates these resources to hunting ground users for management. In Serbia, hunting grounds users are primarily hunting associations and state forest enterprises, which account for 90% of users (Lavadinović et al., 2017). These users are required to develop a 10-year hunting management plan, which the state monitors to ensure proper implementation and control of hunting ground management (Popović et al., 2023). Game meat inspection is mandatory and carried out by veterinary officers or veterinarians. Due to the epidemiological situation in Serbia, the examination of wild boar meat for

Trichinella presence is also mandatory. Over the past twenty years, the quality of hunting grounds in Serbia has improved significantly, primarily due to advancements in infrastructure (Lavadinović et al., 2017). However, not all hunting grounds have game handling facilities for harvested animals – there are 110 facilities in total, with 60% located in Vojvodina. Game meat is most commonly purchased directly from hunters and is available in retail outlets through only a limited number of retail chains.

Although Serbia has a significant body of scientific research on hunting and game animal management, there is a noticeable gap in data regarding game meat production and consumption. Addressing this gap is one of the key objectives of this paper. Currently, there is no available data on the amount of game meat consumed by Serbian consumers. Quantitative data on game meat consumption would enable more precise calculations of chemical hazards intake from food, including pesticides and heavy metals – particularly lead from ammunition. This information is essential for assessing potential health risks for consumers, including both the general population and hunters, who typically consume the largest amounts of game meat.

Therefore, the primary aim of this paper is to provide comprehensive overview of large game meat production in Serbia, covering the entire chain from hunting grounds and hunters to game population indicators and production levels, ultimately concluding with the amount of meat consumed by general population.

MATERIAL AND METHODS

Official data were obtained from the website of the Statistical Office of the Republic of Serbia: the area and population of the Republic of Serbia, including additional data related to the northern province of Vojvodina (SORS, 2023), data on hunters, hunting grounds, large game population status and number of harvested game animals (SORS, 2022). Average hunting ground size, game population density and harvest rate were calculated from these official data.

In Serbia and most Southeast European countries, game animal populations are generally assessed in March (Tomašević et al., 1972). This count represents the number of individuals after the hunting season and before the arrival of new offspring. In contrast, Western European countries report game populations in September, reflecting the number of individuals before hunting and after the reproduction. This difference in reporting methods can lead to discrepancies in the estimated population size. To align the March count with September estimate, the number of piglets per sexually mature female is added, which can range from 1.5-3 piglets for wild boars (Tomašević et al., 1997).

Such variations can result in misinterpretations of game population densities and harvest rates.

The harvest rate was calculated by dividing the number of animals counted in March (before reproduction and after hunting) by the number of animals harvested during the hunting year.

Although Serbia has a total of 13 registered game meat processing facilities, only four have been operational for processing of large game in 2021/2022. Game meat processing facilities are located in the South Banat, South Backa, Zlatibor and Borski district (Figure 2.). The calculation of game meat production was based on data obtained from four game meat processing facilities. Game meat consumption was calculated from total skinless carcass production and population in Serbia/Vojvodina in 2021. Skinless carcass weight is weight of carcass without head, skin, blood, offal and distal portions of hind- and fore- legs.

The statistical analysis was conducted using Microsoft Office Excel 2007. The geographical distribution and density map was created using ESRI ArcGIS Pro version 3.0

Results

Hunting grounds in Serbia encompass 92.6% of the country's total territory, and in the Vojvodina region, they cover 99.4% of the land. There are 347 hunting grounds in Serbia, with an average size of 20,683 ha (13,773 ha in Vojvodina), though their size varies significantly.

Table 1. Hunting grounds and hunters in the Republic of Serbia in 2021

	Surface area (km ²)	Population	Hunters	HG	Surface area of hunting ground (1000ha)			
					Hunting area	Non-hunting area	Total	Forest**
Serbia*	77,474	6,797,105	87,567	347	6,072	1,105	7,177	1,813
Vojvodina	21,614	1,825,982	28,583	156	1,884	264	2,148	162

*-without Kosovo; HG- hunting grounds; ** Forest covered hunting ground

Among large game ungulates in Serbia, roe deer and wild boar exhibit the highest population densities. Density is slightly higher in the Vojvodina compared to the national average.

Table 2. Population of large game animals in 2021

	Red deer	Fallow deer	Roe deer	Chamois	European mouflon	Wild boar
Serbia						
Population *						
Population density (animals/km ²)	7,478 (0.10)	1,504 (0.02)	144,991 (2.02)	821 (0.01)	662 (<0.01)	23,856 (0.33)
Vojvodina						
Population						
Population density (animals/km ²)	4,782 (0.22)	777 (0.04)	61,931 (2.88)	0 (0,00)	172 (<0,01)	8,531 (0.40)

* number of animals before reproduction and after the hunting season (March count)

Table 3. Hunted large game animals in 2021

	Red deer	Fallow deer	Roe deer	Chamois	European mouflon	Wild boar
Serbia						
Hunted animals	984	188	11,454	50	43	15,228
Harvest rate (%)	13.16%	12.50%	7.90%	6.09%	6.5%	63.83%
Vojvodina						
Hunted animals	819	143	3 844	0	11	5,164
Harvest rate (%)	17.3%	18.40%	6.21%	(0,00)	6.40%	60.53%

The harvest rate is the highest for wild boar, followed by red deer, fallow deer, and roe deer.

Table 4. Average meat yield data from game meat processing facilities

	Red deer	Fallow deer	Roe deer	Wild boar
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No. of animals	289	157	182	360
Average carcass weight (kg) $\pm$ SD	69.13 $\pm$ 34.61	41.18 $\pm$ 13.04	16.93 $\pm$ 12.94	34.68 $\pm$ 20.87
Skin (%) /range	11.54 (7.5-18.8)	13.43 (10.5-18.1)	14.00 (9.1-31.7)	33.29 (11.9-42.1)
Meat without bones (%) /range	48.51 (10.4-71.6)	45.54 (21.7-53.3)	44.19 (6.7-58.2)	32.36 (4.0-60.6)

Table 5. Large game meat production in hunting season 2021/2022

	Red deer	Fallow deer	Roe deer	Chamois*	Europ. mou-flon*	Wild boar	Sum
Serbia (animals)	984	188	11.454	50	43	15.228	27.947
Total skinless carcass (t)	68.02	7.74	193.92	1.00	1.29	528.11	800.08
Processed – Half carcass (t)	60.17	6.70	166.77	0.86	1.11	352.30	587.91
Meat without bones (t)	32.99	3.53	85.69	0.44	0.57	170.89	294.12
Vojvodina region (animals)	819	143	3.844	0	11	5.164	9.981
Total skinless carcass (t)	56.62	5.89	65.08	/	0.33	179.09	307.00
Processed – Half carcass (t)	50.08	5.10	55.97	/	0.28	119.47	230.90
Meat without bones (t)	27.46	2.68	28.76	/	0.15	57.95	117.00

* precise information about weights and yields are not available, total weight of mou-flon and Chamois participates with 0,3% of annual production

Regarding total game meat production, wild boar contributes the most, followed by roe deer, red deer, and fallow deer. The estimated consumption rate of large game meat in Serbia is 0.120 kg per person per year with Vojvodina having higher rate of 0.176 kg per person per capita.

Figure 1. Average consumption (kg) of large game meat in general population in Serbia and Vojvodina (red and green bar) compared to other European countries presented by Sevillano Morales et al, 2018 (grey bars)

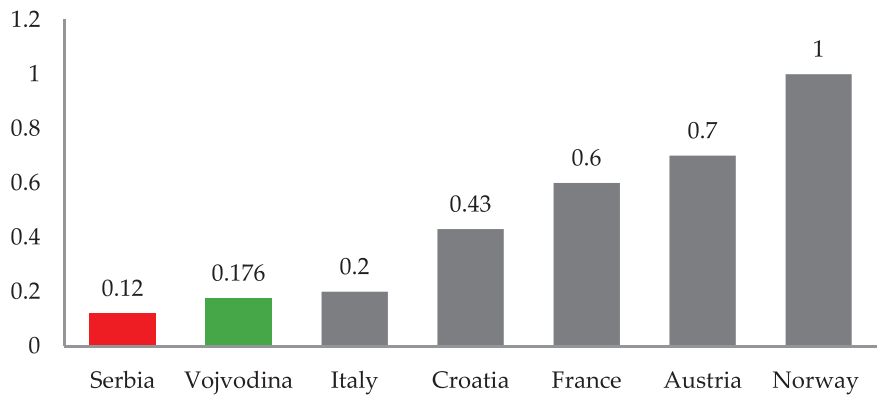
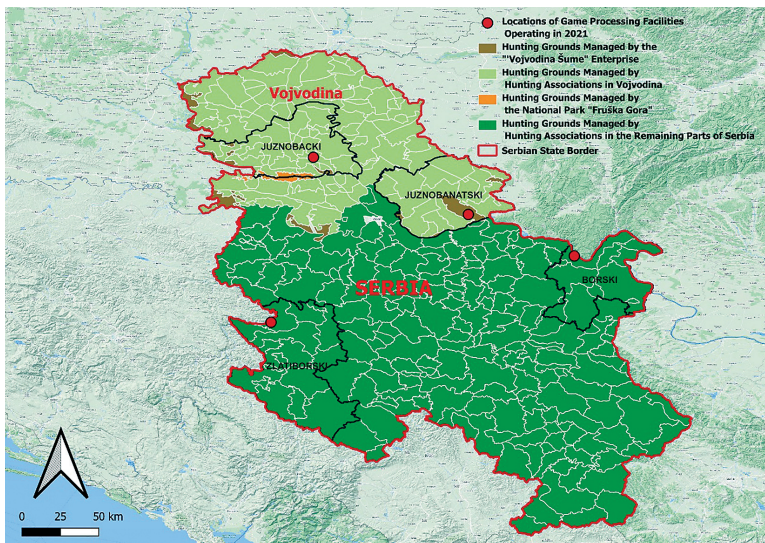


Figure 2. Map of hunting ground management organizations in Serbia and locations of game meat processing facilities operating in 2021 (red dots)



DISCUSSION

According to data from the European Federation of Associations for Hunting (FACE), there were 7 million registered hunters in Europe in 2021.

France had the largest number, totaling 1.3 million hunters, followed by Spain (980,000), the UK (800,000), and Italy (750,000) (Benko et al., 2020). In 2021, Serbia had 87,567 registered hunters, representing 1.2% of the total population (6,797,105). This percentage is slightly below the European average of 1.4%. However, in Vojvodina, which has a population of 1,825,982, the proportion of hunters is higher than the European average, standing at 1.6%. Studies suggest that hunter density is more closely linked to overall population density rather than prey density (Mysterud et al., 2020).

In Serbia, hunting grounds are managed primarily by hunting fellowships (nearly 80%), followed by state forest enterprises, national parks, universities, the army, and private hunting grounds (Lavadinović et al., 2017). Hunting grounds cover 92.6% of Serbia's total territory, with an even higher percentage (99.4%) in Vojvodina (Figure 2.). Hunting is allowed throughout most of the country, with the exception of settlements, industrial zones, transportation routes, and historical sites (Lavadinović et al., 2017). A significant proportion of hunting grounds (over 90%) were also found in Austria, Poland, Denmark, and Germany, in contrast to several other European countries (Šelmić et al., 2001).

The average size of hunting grounds in Serbia has been decreasing due to fragmentation. In 2001, the average hunting ground covered 27,500 hectares, but by 2021, this declined to 20,683 hectares. Compared to hunting grounds in Europe, those in Serbia are still significantly larger. For instance, the average size of hunting grounds in Austria is 75 hectares, in Finland 105 hectares, and in Belgium 300 hectares (Šelmić et al., 2001). Each hunting ground in Serbia includes a non-hunting area, which, on average, makes up 15.4% of the total area (12.3% in Vojvodina). The average non-hunting area covers 3,184 hectares, which is larger than the average hunting ground in Europe. This extensive size presents challenges for managing hunting grounds, game populations, and wildlife conservation efforts. The dominant land use within these hunting grounds is agricultural land, accounting for 45.5%, followed by forests and woodlands (28.7%), grasslands (18.8%), water surfaces (1.3%), and other uses (5.6%) (Lavadinović et al., 2017).

In Serbia, each hunting ground typically employs one wildlife professional and one to three gamekeepers, which remains insufficient for effective wildlife management. However, in recent years, infrastructure improvements have been noted, including an increase of number of hunting facilities, feeding stations, and salt licks. Despite these improvements, only about one-quarter of hunting grounds have cold storage facilities for venison (Lavadinović et al., 2017), as well as other necessary facilities for carcass processing, veterinary

inspection, cleaning and disinfection. This largely complicates the safe production of game meat.

The roe deer (*Capreolus capreolus* L. 1758), red deer (*Cervus elaphus*) and wild boar (*Sus scrofa*) are widely distributed game species across Europe, with population consistently increasing over last 50 years. Roe deer populations have been rising since the early 20th century, while wild boar populations have grown significantly since mid-20th century (Burbaitè and Csányi 2010; Burbaitè and Csányi 2009; Massei et al., 2015). The increase in certain game populations is believed to be a result of greater food availability in forested areas, reduced hunting pressure, and a decline in natural predators over the course of the twentieth century (Côté et al., 2004). This trend has also been observed in Serbia, where populations of these species have expanded (Burbaitè and Csányi, 2009; Burbaitè and Csányi, 2010; Lavadinović et al., 2020).

The roe deer, wild boar and red deer are autochthonous species and represent the most biologically and economically valuable large game species in Serbia. The allochthonous large game species include fallow deer (*Dama dama*) and mouflon (*Ovis aries musimon*), while chamois (*Rupicapra rupicapra*) are considered autochthonous, but have limited economic value due to small population size. As deer and wild boar populations continue to grow, their harvest rates are also increasing (Burbaitè and Csányi, 2009; Burbaitè and Csányi, 2010; Escobar-González et al., 2024). Roe deer is the most abundant wild ungulate species in Serbia. In Europe, Germany has the largest roe deer population, estimated at 600,000 to 3,000,000 animals, followed by France, Poland, and Sweden (Burbaitè and Csányi, 2009). Serbia's roe deer population stands at 144,991, placing the country in the mid-range among European nations. Population size in Serbia is similar to that of Switzerland, Norway, and Romania, while also being the largest population among the former Yugoslav countries. According to official data, Serbia had a roe deer density of 2.02 animals/km² in 2021 (table 2). However, monitoring using advanced methods such as binoculars, thermal cameras, night vision monocular, and photo cameras has recorded significantly higher densities, ranging from 16 to 112 animals/km² (Popović et al., 2023). Roe deer density across Europe vary considerably. The highest densities are recorded in Denmark, Luxembourg, Austria, and Germany, where populations reach 8 to 9 animals/km². As of 2005, Serbia was classified as having a medium roe deer density, with an average of 1 to 3 animals per square kilometer (Burbaitè and Csányi, 2009). Countries with the largest roe deer populations also tend to have highest harvest rate, ranging from 34% to 44%. In contrast, Serbia's harvest rate is 7.9%, which is slightly higher than Romania's 5.1%, but lower than Croatia's 15.4% (Burbaitè and Csányi, 2009).

The data from Serbia are comparable to those of other Southeastern European countries, as the same calculation methods are used.

Wild boars are widespread across Serbia and play a significant role in local hunting, inhabiting 75% of the country's hunting grounds (Lavadinović et al., 2017). France and Germany have the largest populations of wild boars in Europe, each with around half a million animals, followed by Poland and Spain, with populations ranging between 200,000 and 300,000. The wild boar population in Serbia is similar to that in Croatia (FAO, 2018). According to the EFSA report (ENETWILD Consortium et al., 2022), the density of wild boars in Europe ranges from 0.35 ± 0.24 to 15.25 ± 2.41 animals/km². In Serbia, however, the density was found to be 0.33 animals/km² in 2021 (Table 2). Previous reports (SANCO, 2011) suggest that the density of wild boars in Serbia varies between 0.2 and 1.38 animals/km². The population density of wild animals, in general, varies significantly depending on the hunting grounds and the methods used for data collection. In contrast to deer, the harvest rate for wild boars in Serbia is statistically very high at 63.83%. This rate is influenced by the fact that the March population of wild boars is reported as the breeding stock in the official data from the Statistical Office of the Republic of Serbia. However, domestic studies that calculate harvest rates in relation to the parent population reported a harvest rate of 29-30% (Lavadinović et al., 2020). The wild boar is the most frequently hunted large game species in Serbia, not only due to the appeal of the hunt but also because of the significant damage these animals can cause to agriculture and the frequent conflicts with humans. (Lavadinović et al, 2020).

The UK, Spain, Poland, and Denmark have the largest populations of red deer in Europe, ranging from 150,000 to 300,000 animals. Serbia is among a group of countries, including Belgium, Turkey, and Croatia, with population of several thousand red deer (Burbaitè and Csányi, 2010). The population density of red deer varies across European countries and regions from 0.3 to 44.6 animals/km². In Serbia, the population density of red deer is slightly lower than the European average, at approximately 0.1 animals/km² (Table 2), which is similar to that of Croatia. The population density is influenced by the presence of large carnivores, but the most significant impact comes from human activities, particularly hunting and agriculture (Van Beeck Calkoen et al., 2023). The average harvest rate for red deer has remained consistent in Europe over the past few decades, at around 25% (Burbaitè and Csányi, 2010). In Serbia, however, the red deer harvest rate is considerably below the European average, standing at only 13.6%. This discrepancy is partly due to the breeding stock being reported based on the number of deer counted in March, which reflects a population increase program in the central mountainous regions of

the country.

The fallow deer is one of the most common and widespread cervid species in Europe. Its population has increased fivefold since 1984, reaching nearly 650,000 animals by 2020 (Bijl and Csányi, 2022). Among cervid species, fallow deer are experiencing the fastest population growth in Europe, making them one of the most overabundant species. The increase in the fallow deer population is also influenced by hunters' preferences, as they often favor hunting roe and red deer (Bijl and Csányi, 2022). In Serbia, the population of fallow deer is smaller than that of roe and red deer and is in continuous decline. In 2021, the population density was just 0.02 animals/km² (Table 2). The harvest rate for fallow deer in Europe is 21.32% (Bijl and Csányi, 2022), whereas in Serbia, it is much lower at 12.5%, despite differences in how the breeding stock is reported and ongoing efforts to preserve the population.

The chamois inhabits the mountainous regions of central and southern Europe, with an estimated population of around half a million individuals. Most subspecies of chamois are considered endangered, primarily due to human activities. The European mouflon, originally native to Sardinia and Corsica, spread across much of Europe over the past century. At one point, its population declined due to expansion of sheep farming (Temerario et al., 2024). The population density of chamois was 0.01 animals/km², while that of mouflon was less than 0.01 animals/km² (Table 2). The harvest rate is very low for both mouflon and chamois due to efforts to preserve this small population in Serbia.

Game meat farming offers several significant benefits, including conservation of endangered species, economic advantages (such as meat production, sale of by products and live animals) and social benefits (such as employment, tourism, and potential reduction of poaching) (Lindsey et al., 2013; Urošević et al. 2016). The legal requirements for farmed game are outlined in Regulations 852/2004 and 853/2004, as well as national legislative of member states (Urošević et al. 2016). These regulations cover animal health, farm management and animal welfare. Serbia lacks a specific legislative framework that would enable the legal production of farmed game.

In Serbia, the production of domestic animal meat in 2021 totaled 587,000 tons (SORS, 2022). According to our data large game meat production reached 800.08 tons in the same year. The most commonly produced game meat was wild boar, totaling 528.11 tons, followed by roe deer at 193.92 tons and red deer at 68.02 tons, 7.74 tons of fallow deer and 1 tone each chamois and mouflon. (table 5). While global game meat production is on the rise, Europe has seen a slight decrease. However, import of game meat into Europe has been on the rise. Compared to other European countries, Serbia is one of the smallest producers of large game meat. Germany and France are the leading producers of

wild boar meat, with annual outputs of 36,444 tons and 40,991 tons, respectively. Other countries, such as Czech Republic, Spain, and Poland, produce between 10,000 and 23,000 tons, while neighboring Croatia produces 1,800 tons (FAO, 2018). The largest producers of roe deer meat are Germany and France, with 22,791 tons and 11,021 tons, respectively, while most other European countries produce between 1,200 and 4,000 tons. When it comes to red deer meat, Spain, Poland, and Germany are the largest producers, with 20,881 tons, 13,376 tons, and 11,154 tons, while other countries produce between 1,000 and 8,000 tons. The largest producers of fallow deer meat are Germany, Sweden, and the Czech Republic, with between 1,000 and 3,000 tons, while most other European countries have production levels below 1,000 tons (FAO, 2018).

In Serbia, game meat is most commonly obtained during hunts or directly at hunting grounds following the hunt. It is also available in some restaurants and can be purchased in a limited number of retail outlets. In Eastern Europe, game meat is often obtained directly from hunters, either through purchase or as gifts (Tomasevic et al., 2018). This pattern is similar in other European countries and the USA (Corradini et al., 2022). Game meat is primarily procured for preparing game dishes or for the production of traditional meat products. Research on consumer attitudes in Eastern Europe (Tomasevic et al., 2018) found that game meat is consumed more frequently and preferred by men. It is also more commonly consumed by residents of rural areas compared to urban settings, and by adults more than children. When it comes to concerns about meat safety, consumers in Croatia have concerns regarding the presence of *Trichinella* spp. (Tolušić et al., 2006), which is likely the case in Serbia as well. Despite this, consumers generally believe that game meat is ecologically healthy to eat (Tolušić et al., 2006; Corradini et al., 2022). Some consumers avoid game meat due to its distinct taste and smell, while others prefer it and consider it tastier than domestic meat. This preference is particularly common among hunters (Marescotti et al., 2020; Hoffman et al., 2005). The highest levels of meat consumption worldwide are found in hunting families (Corradini et al., 2022).

The average resident of Serbia consumes 45.9 kg of meat from domestic animals annually (SORS, 2022). According to our survey, the average Serbian resident eats 0.120 kg of large game meat each year, with a slightly higher rate of 0.176 kg in Vojvodina. These amounts are 0.3% of total meat consumption in Serbia and 0.4% in Vojvodina. In Croatia, the average consumer eats about 0.55 kg of game meat annually, accounting for approximately 1% of total meat consumption (Tolušić et al., 2006). According to Sevillano Morales et al, (2018) who summarized the data from European countries, game meat consumption in the general population is relatively low: 0.1-0.3 kg in Italy, 0.6

kg in France, 0.7 kg in Austria, and 1.0 kg in Norway. In contrast, hunting families in Spain consume an average of 6.87 kg, while in Norway, the figure is 7 kg. Germany has the largest population of large game animals, a high game density, and leads in the production of game meat, reaching 18 kg per person in hunter families. Overall, the consumption of large game meat in Serbia is lower than in most European countries, which aligns with the fact that game meat production is also lower here.

The low production and consumption of large game meat suggests that there is potential for the popularization of game meat and an increase in its consumption. For example, the lower price of wild boar meat compared to pork, and venison compared to beef, could be important factors in encouraging greater consumption of game meat.

CONCLUSION

The number of hunters in Serbia is somewhat lower than the European average. The hunting grounds in Serbia cover nearly the entire country, and their average size is significantly larger than the average hunting grounds in Europe. This contributes to the relatively low population density of large game animals in Serbia. Among large game animals, only the roe deer has a medium population density, while other species have relatively low population densities compared to their counterparts in other European countries. Additionally, the fallow deer population in Serbia is declining, with some areas facing complete extermination of the species. The harvest rate of large game animals in Serbia is generally low, except for wild boars, and is influenced by the abundance or overabundance of certain species. Overall, the production and consumption of large game meat are quite low in the country. This data suggests there is potential for the popularization of large game meat and an increase in its consumption.

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Author's Contribution

JP carried out literature research, designed a study, analyzed the results and drafted the manuscript, JM designed a study, carried out data collection, survey of consumption, IL carried out survey of consumption, JK and JPR were involved in literature research, MU was involved in data analysis. JM revised the manuscript critically and together with JP prepared the final draft of the manuscript. All authors have read and approved the final manuscript.

Competing interest

All authors disclose any financial or personal relationships with individuals or organizations that might inappropriately affect their work.

Authors' ORCID IDs

Jelena Petrović: <https://orcid.org/0000-0001-5556-8558>,
Jovan Mirčeta: <https://orcid.org/0000-0001-6667-3417>,
Ivan Ludoški: <https://orcid.org/0009-0003-2153-7405>,
Jasna Kureljušić: <https://orcid.org/0000-0002-9366-1857>,
Jasna Prodanov Radulović: <https://orcid.org/0000-0002-6116-3271>,
Miroslav Urošević: <https://orcid.org/0000-0002-8173-5986>

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