

WEIGHT CHARACTERISTICS OF CARCASS AND ANTLERS IN ROE DEER (*CAPREOLUS CAPREOLUS* L.) AND RED DEER (*CERVUS ELAPHUS* L.) IN WEST POMERANIA

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ABSTRACT

West Pomerania is one of the richest regions in Poland when it comes to big game. The review is a comparison of the weights of carcasses and antlers of red-deer stags and roe-deer bucks harvested in the West Pomeranian Voivodeship with data from other regions of Poland. It was found that the weight of the carcasses and antlers was average compared to those assessed in other regions of the country. High and significant correlations were also found between carcass weight and antlers weight in both stags of red deer and bucks of roe deer.

Key words: roe deer, red deer, carcass and antler weight

INTRODUCTION

Wildlife management in Poland, which includes hunting, is carried out in accordance with the highest standards of responsible usage of the resources of arable lands, forests and lakes, aiming at the conservation and, if necessary, improvement of the game's habitat. An important element of the hunting and game management is planning, which is aimed at maintaining the proper level of the population, as well as the age- and sex structure of a given species. When it comes to selection culls, the animals that are unsuitable for breeding are removed from the herd; reduction culls, on the other hand, are aimed at reducing the quantity of the game to a level that will ensure their optimal living conditions in a given area.

Roe deer (*Capreolus capreolus* L.) and red deer (*Cervus elaphus* L.) belong to the most important species classified as big game. As reported in 2019 by the Polish Hunting Association's Research Station in Czempin, 83,200 red deer and 195,900 roe deer were harvested during the hunting season of 2018/2019. However, in the 2019/2020 season, these numbers were estimated at the levels of 229,000 and 834,000, respectively. Individual quality is part of the management of the entire populations of game, including deer. The most basic informa-

tion available from the obligatory records kept in hunting clubs and forest districts is the weight of the carcasses and antlers of red- and roe deer.

According to the data published by the Research Station in Czempin [Polish Hunting Association 2019], West Pomerania is one of the voivodships with the greatest abundance and acquisition of these species, where the population of red deer was estimated at the level of 41,767, and the harvest reached 15,867. As far as roe deer are concerned, these numbers were 83,808 and 19,099, respectively. Additionally, West Pomerania is the region where the highest number of red deer medal trophies are achieved.

According to Panek and Budny [2020], there is a clear regional variability, particularly in the populations of red deer. A high level of harvest takes place mainly in the western part of Poland. The highest harvest per 1000 ha of forest areas takes place in the hunting districts of Szczecin, 27.8, Wałbrzych, 27.1, and Koszalin, 24.6. The regional variability in roe deer harvest per unit of hunting management area is relatively low. During the season of 2019/2020 the highest harvest rates per 100 ha of the overall area were found in the district of Opole, 13.6, Wrocław, 12.9, and Legnica, 11.4. This rate in the Szczecin district was 10.2.



Evaluation of carcass and antlers weight in roe-deer bucks

Studies on roe deer carried out so far prove that the individual quality of bucks, assessed on the basis of carcass weight and antler weight, varies significantly across Poland [Brzuski et al. 1997, Drozd et al. 2000, Kulak and Wajdzik 2009, Wajdzik et al. 2007, Żurkowski and Chartanowicz 1998, Pielowski 1999]. The heaviest roe deer bucks with strong and massive antlers are found in the central, eastern and south-eastern parts of Poland.

According to Wajdzik et al. [2015], the carcass weight and antler weight as well as the antler quality (form) were significantly influenced by the forest cover of the district and the quality of the soil there. The winning specimens in terms of carcass weight and antlers and the form of antlers were obtained in typically arable-land areas (forest cover up to 10%), and the poorest ones in areas with forest covering over 40% of the land. In terms of the weight of the carcass and antlers, and the form of the growing antlers, the best bucks came from the districts where chernozems, mads and rendzina soils predominated.

Our own research carried out in Western Pomerania (Table 1) reveals that the weights of the body and the antlers were average in relation to the rest of the country. In Western Pomerania, however, a fairly large variation in the body weights of harvested bucks (mostly from field-forest areas) was found, which also applies to the weight of their antlers. The correlations estimated between body weight and antler weight were quite high, significant and ranged from 0.42 to 0.68, which applied to the average value and both age classes.

Evaluation of carcass and antlers weight in stags

A number of authors report results of their studies on red deer population, focusing on evaluation of carcass and antlers weight, including Brewczyński [2002], Dzięciołowski et al. [1996], Feulner et al. [2004], Janiszewski et al. [2011], Krupka et al. [1986], Merta et al. [2002], Zachos et al. [2016], Pych et al. [1999], Szczepański et al. [2006] and Szczepański and Zalewski [1994].

According to Dzedzic et al. [2003], an analysis of carcass weight showed that only red deer stags from the Bieszczady Mountains are heavier than those living in the Lublin region. Considering the deer origin in the Lublin region (approx. 70% from Greater Poland and approx. 30% from Masuria), it can be stated that the habitat and biotic conditions are very favourable for this species, which is reflected in on average higher carcass weight. The physiographic diversity of the Lublin region causes the carcass weight to vary, but it is visible in older ani-

mals, and the heaviest stags come from Polesie. Carcass weight changes during the hunting season and the differences increase with the age.

According to Janiszewski and Szczepański [2004] who analyzed the weight of stag carcasses over 15 hunting seasons, there is a significant effect of season on the carcass weight. Zalewski [2008] stated that the weight of the antlers in the initial years of life is one of the features of the least importance for the valuation of the antlers. Only in the subsequent age groups, a steady increase in the importance of the weight of antlers for the final CIC valuation is observed. The climax of this phenomenon takes place at age 9–10 years.

Wajdzik et al. [2014] estimated that antlers weight is significantly correlated with the age of the stags ($r = 0.88$), carcass weight ($r = 0.84$), and the form of the antlers ($r = 0.79$).

According to Nasiadka et al. [2016] in the autumn and winter period, there is a decrease in carcass weight in stags participating in the rutting season, aged over 6 years, and in younger, 2–5 year old stags. Young stags have a weight loss of about 20% and older stags about 35%. The decrease in carcass weight in the autumn and winter period is not uniform. The highest, nearly 50% of the total weight loss was recorded after the rut. In the period from November to December, even a slight increase in carcass weight was observed, and then it decreased again until the end of winter.

According to Hędrzak [2018], the average weight of red deer stags from south-eastern Poland aged 2 to 16 years was 129.72 ± 28.74 kg, and the weight of antlers was 3.40 ± 1.87 kg, for all of stags, a highly significant correlation was found between the weight of the carcass and the weight of the antlers ($r = 0.77$). All correlations between these traits, calculated within particular age groups, were highly significant except for stags older than 14 years. For 2- and 3-year-old stags the correlations were relatively low ($r = 0.24$ and $r = 0.35$), for stags 4–7 years and 11 years old it was average (from 0.44 to 0.47), slightly lower at 8–10 years 0.34–0.38. The highest correlations were found in stags 12–14 years of age (0.52 to 0.59). In the authors' own research carried out in Western Pomerania (Table 2), very large and statistically significant ($P \leq 0.01$) correlation coefficients between the weight of the carcass and the weight of the antlers were also found, which for all of the assessed stags was $r = 0.81$. It was also statistically significant in individual age classes ($P \leq 0.01$) and amounted to 0.78, 0.79 and 0.67, respectively.

SUMMARY

Based on the analysis, it can be concluded that the body weight of roe deer bucks and red deer stags as well as the weight of their antlers were average compared to others

Table 1. Comparison of the average body weight and the average weight of goat antlers in Western Pomerania and other selected regions of Poland

Author	Region	Age class	Trait	
			Body weight, kg	Antlers weight, g
Own research	West Pomerania	I	12.5–14.0	130–230
		II	15.3–17.3	142–250
		III	–	–
Wajdzik et al. [2015]	Opole district	I	14.3	182.7
		II	16.3	287.7
		III	16.3	308.8
Żurkowski and Chartanowicz [1998]	Piska Forest	I	14.3	196.8
		II	16.4	270.8
		III	17.4	290.0
Dziedzic and Flis [2006]	Lublin Heights	I	15.3	165.5
		II	18.6	302.8
		III	19.1	331.8
Zalewski and Mrozek [2006]	Olsztyn district	I	15.5	175.6
		II	17.5	267.4
		III	18.0	320.6
Szczerbiński et al. [1972]	Vicinity of Poznań	I	12.0	–
		II	14.6	–
		III	16.0	–
Wajdzik et al. [2007]	Cracow district	I	15.1	181.8
		II	17.3	296.8
		III	17.9	361.9

Sources: Wajdzik et al. [2015], Żurkowski and Chartanowicz [1998], Dziedzic and Flis [2006], Zalewski and Mrozek [2006], Szczerbiński et al. [1972], Wajdzik et al. [2007].

Table 2. Average weight of carcass and antlers of red deer stags obtained in selected regions of Poland by age class, kg

Region	Carcass			Antlers			Source
	I	II	III	I	II	III	
West Pomerania	87–105	110–125	124–156	1.40–1.85	3.18–3.34	4.7–6.8	Badania własne
Gostynin	80–105	127–145	144	0.83–2.49	4.15–5.32	5.5	Nasiadka et al. [2016]
Spała	70–100	125–143	137	0.96–2.57	4.62–6.28	7.14	Nasiadka et al. [2016]
Puszcza Kozienicka	98	142	157	1.87	4.15	7.43	Serdeczny [2016]
Puszcza Dulowska	100	135	155	2.41	4.43	6.47	Wajdzik et al. [2014]
RDLP Krosno	113	146	151	2.25	4.57	5.72	Brewczyński 2002
Puszcza Piska	98	133	150	1.80	3.52	5.60	Żurkowski et al. [2000]
Warmia and Masuria	98	136	150	1.97	4.45	6.10	Czyżyk et al. [2007]
Wielkopolska	98	115	150	1.71	3.42	4.92	Łabudzki [1993]
Bory Tucholskie	–	–	–	1.76	3.23	4.95	Kobielski et al. 2007
Gorzów district	98	141	150	2.53	3.85	5.85	Więckowski 1997
Polesie	86–119	140	184	–	–	–	Dziedzic et al. [2003]
Wyżyna Lubelska	84–117	129	132–144	–	–	–	Dziedzic et al. [2003]
Roztocze	81–110	128	151	–	–	–	Dziedzic et al. [2003]
Kotlina Sandomierska	81–110	124	–	–	–	–	Dziedzic et al. [2003]

Sources: Brewczyński 2002, Czyżyk et al. [2007], Dziedzic et al. [2003], Kobielski et al. 2007, Nasiadka et al. [2016], Serdeczny [2016], Wajdzik et al. [2014], Więckowski 1997, Łabudzki [1993], Żurkowski et al. [2000].

evaluated in Poland. However, quite a significant variability in the analyzed features was found, which was caused, as shown by other authors, among others by the richness of the hunting grounds, forest cover, soil quality, hunting seasons and other habitat and biotic features.

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CHARAKTERYSTYKA MAS TUSZ ORAZ POROŻY SARNY (*CAPREOLUS CAPREOLUS* L.) I JELENIA SZLACHETNEGO (*CERVUS ELAPHUS* L.) NA TERENIE POMORZA ZACHODNIEGO

STRESZCZENIE

Pomorze Zachodnie należy do regionów najzasobniejszych w zwierzynę grubą. Przeprowadzono porównanie mas tusz i poroży jeleni byków i saren kozłów pozyskanych na terenie województwa zachodniopomorskiego z danymi z terenu różnych regionów Polski. Stwierdzono, że masa tusz oraz poroży jeleni byków i kozłów była przeciętna w stosunku do ocenianych w innych regionach kraju. Stwierdzono również duże i istotne zależności między masą tuszy i masą poroża u jeleni byków i saren kozłów.

Słowa kluczowe: sarna, jeleni szlachetny, masa tuszy i poroży