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# Investigating Consumer Attitudes About Game Meat: A Market Segmentation Approach

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**Abstract:** Game meat is recognized as a high-quality food known for its unique sensory properties and numerous health benefits. Nevertheless, the consumption of game meat is still significantly lower compared to other types of meat. The aim of this study was to identify and describe consumer segments that are more inclined to consume game meat. An online survey was conducted with 603 participants from Croatia, and three consumer segments were identified: game meat lovers, occasional consumers of game meat, and consumers averse to game meat. This segmentation was based on consumer attitudes towards game meat, with the groups differing significantly in their consumption behavior, attitudes towards hunting, hunting experience, and sociodemographic characteristics. These results provide valuable insights for game meat producers and the industry, enabling them to develop targeted marketing strategies that cater to the different preferences and requirements of these consumer segments.

**Keywords:** game meat; attitudes; consumer; consumer segmentation; food preferences; hunting



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## 1. Introduction

Understanding individual food choices is essential for transforming the current food system to promote both human health and planetary sustainability. In recent years, consumer eating habits have changed significantly, with health emerging as a key driver when choosing food [1]. Consumers are paying more attention to the quality, nutritional value, and origin of the food they consume. Simultaneously, environmental awareness is growing, driving some consumers to consider sustainability in their food choices. As a result, sustainability and the mitigation of climate change linked to food production are gaining importance in food-related decision-making [2].

One of the major challenges in the coming years will be to answer the question of how to ensure a healthy and sustainable diet for the growing global population. Numerous researchers suggest switching to plant-based diets, as animal production has been shown to significantly contribute to climate change and air pollution, particularly through its carbon footprint [3]. Plant-based diets prioritize the consumption of plant sources such as grains, fruits, nuts, and fresh or cooked vegetables to maximize the consumption of nutrient-rich foods that can replace traditional animal products [4].

Although the consumption of plant-based foods is encouraged, many consumers, particularly in Eastern and Central Europe, where meat consumption is notably high, find

it difficult to change their eating habits. The transition toward reducing the consumption of foods of animal origin and increasing plant-based alternatives is slow [5]. A significant barrier to this transition is the lack of awareness among consumers about the environmental and climate-related impacts of meat consumption [6,7]. This knowledge gap hinders efforts to reduce meat intake [8].

Game meat represents an alternative to conventional farmed animal products, as it avoids many of the undesirable characteristics associated with intensive industrial livestock farming. In addition, game meat is not subjected to the stress associated with industrial livestock farming and, if hunted properly, there is none of the stress associated with transporting domestic animals to the slaughterhouse. A varied diet in the natural habitats of wild animals and higher physical activity are just some of the factors that influence the special taste, appearance, texture, and unique nutritional properties of game meat [2]. Game meat is characterized by its low energy density and reduced fat and cholesterol content [9,10]. In addition, game meat is an excellent source of protein with a favorable ratio of n−6/n−3 fatty acids. The content of essential amino acids, vitamins (B1, B2, B6, E) [10,11], and micro- and macroelements (phosphorus, magnesium, iron, manganese, and zinc) [11,12] is significantly higher in game meat than in meat from other animals.

However, despite its nutritional advantages, game meat also presents certain challenges related to food safety and sensory attributes. Wild animals can carry foodborne diseases, including bacterial pathogens, parasites, viruses, and lead exposure [13,14]. Unlike domesticated livestock, which are subject to stringent health checks, wild game is often processed under less regulated conditions, increasing the risk of contamination [15]. Additionally, game meat has a distinct flavor and texture that may not be appealing to all consumers [16]. While some individuals may appreciate its stronger, more intense taste, others may find it unpalatable, which can limit its broader acceptance in mainstream markets [16,17].

These factors contribute to the relatively low consumption of game meat in Europe, despite the recognized health benefits. According to data from the Bureau of Statistics of the Republic of Croatia [18], the per-capita consumption of meat in the category "other", which includes horse and game meat, was just 0.2 kg in 2019, down from 0.55 kg in 2003 [19]. Game meat consumption in European countries is between 0.2 and 1.1 kg per capita per year [2]. However, only 2–4% of the population regularly consume game meat [20].

These data indicate that game meat consumption is limited to a small niche of consumers, despite the acknowledged benefits of the product. For this reason, it is essential to identify the characteristics of consumers who tend to consume game meat. In the literature, there is a lack of research focused on the factors that shape consumer attitudes toward this alternative protein source, particularly through the analysis of distinct consumer segments. This study aims to address that research gap by providing empirical data describing the perceptions of game meat across different consumer segments.

Segmentation helps marketers identify distinct consumer groups that share similar behaviors, attitudes, or characteristics. Segmentation of game meat consumers is pivotal because it can identify distinct profiles and help to tailor marketing messages, improve product supply, and align strategies with consumer needs and preferences [11]. By profiling specific subgroups of consumers based on characteristics such as sociodemographic factors, attitudes, lifestyles, and behavior, segmentation facilitates more effective communication and product positioning, particularly in a market where consumer reasons for consuming or avoiding game meat vary widely [21].

In this paper, we examine the preferences of Croatian consumers regarding game meat by investigating their attitudes and behavior. Through segmentation based on attitudes toward

game meat, we describe the obtained segments focusing on sociodemographic data, hunting experience, attitudes towards hunting, and past behavior in game meat consumption.

We aim to explore how preferences vary across different consumer profiles. This approach enables the identification of the motivations that drive game meat consumption in Croatia and of the barriers that might prevent consumers from including it in their diets. The insights generated from this research will be beneficial for different stakeholders, facilitating more effective engagement with diverse consumer segments. Finally, this study contributes to the broader discourse on sustainable food choices and highlights the significance of exploring alternative protein sources within contemporary food systems.

## 2. Literature Review: Segmentation of Game Meat Consumers

In recent years, research on game meat consumption has grown significantly, reflecting increasing consumer interest in healthy and sustainable food products [22]. Game meat, particularly from deer, boar, and moose, is perceived as a natural and high-quality food with unique sensory characteristics and several health benefits, such as a low fat content and excellent nutritional profile [23]. However, game meat is also a product that generates ethical debates about hunting and food safety [2,11]. Studies have explored this preference heterogeneity by performing consumer segmentation, identifying distinct groups with varying motivations, preferences, and concerns regarding wild game meat consumption [11,24,25].

Studies have employed various variables to segment consumers of game meat. Psychographic variables, concerning consumer beliefs and perceptions—such as attitudes toward hunting and values—have been particularly effective in identifying motivations [11,25–28]. In particular, ethical concerns regarding hunting and animal welfare play a pivotal role in shaping preferences, especially among consumers who prioritize sustainability [11,27,29]. Behavioral variables, such as willingness to pay, have also been a key factor in distinguishing segments [24,26]. For instance, some consumers are price-sensitive and prioritize affordability, while others are willing to pay a premium for ethically sourced or high-quality game meat.

Demartini et al. [26] employed clustering and a choice experiment to identify two primary segments of Italian consumers: one with a positive attitude toward game meat and another with a negative attitude. Those with a positive attitude demonstrated a willingness to pay three times more for game meat than those with a negative attitude. However, many consumers with a positive attitude were unfamiliar with how to purchase and prepare it, due to its limited availability in traditional retail outlets.

Marescotti et al. [11] analyzed Italian consumers of hunted game meat, identifying three segments: pro-animal, disoriented, and game meat eaters. They highlighted a significant lack of consumer knowledge regarding game meat and its properties, with notable differences in attitudes toward animal welfare and hunting activities. In a subsequent study, Marescotti et al. [27] identified two clusters based on attitudes toward animal welfare: an animal rights cluster, characterized by greater ethical awareness, and the animal utilitarian cluster, marked by a more utilitarian view. Moreover, latent class analysis revealed four consumer classes: cured meat eaters, game meat lovers, anti-hunting consumers, and price-sensitive consumers.

Niewiadomska et al. [30] applied cluster analysis of Polish consumers based on attitudes towards game meat and found three segments: indifferent, fearful, and selective. The segments differed in their perceptions of health risks associated with game meat consumption, with strong sociodemographic influences. Women and younger individuals tended to have more concerns about food safety compared to men.

Czarniecka-Skubina et al. [2] conducted a survey of Polish consumers, identifying six clusters of game meat consumers and four clusters of non-consumers. The main factors discouraging game meat consumption included high price, limited availability, and a lack of family tradition.

Fantechi et al. [24], through a choice experiment in Italy and the combination of a structural equation model with latent class analysis, confirmed the importance of attitude toward animal welfare and hunting as determinants of the attitude toward game meat. Consumers with a stronger focus on animal welfare tended to prefer game meat, perceiving it to be a more natural compared to farmed meat.

Matilainen et al. [25] explored consumer segments for moose meat in Finland, identifying three clusters: established, skeptical, and ambivalent. Attitudes toward hunting and hunters significantly influenced opinions on game meat, with the established cluster having greater access to moose meat through social connections with hunters.

The literature on consumer segmentation of game meat consumption highlights common trends in attitudes, values, sociodemographic profiles, and willingness to pay. Despite regional differences, similar patterns emerge across studies, particularly regarding attitudes toward hunting and ethical concerns.

A central theme in consumer segmentation based on attitudes toward game meat and hunting is the identification of a significant portion of consumers who prefer game meat for its perceived health benefits, superior taste, and naturalness [11,26,27]. However, ethical concerns surrounding hunting and animal welfare remain significant barriers, especially among those opposed to hunting [2,30]. Some consumers perceive wild game meat as a more sustainable and ethical alternative to farmed meat, even though they may oppose recreational hunting [25].

Health concerns are a critical factor. While some consumers view wild game meat as a healthier alternative to conventional meat, others, particularly women and younger consumers, express caution due to perceived health risks, preferring certified, high-quality products [24]. This divide results in distinct consumer profiles regarding willingness to pay, with health-conscious consumers more inclined to pay a premium for ethically sourced, safe game meat [27,30].

Familiarity with wild game meat and its availability also significantly impact consumer behavior. Many urban consumers are unfamiliar with how to purchase, prepare, or assess the quality of wild game meat, largely due to its limited presence in mainstream food retail [26]. Similarly, a segment of consumers often refrains from eating wild game due to a lack of tradition and availability, rather than fundamental opposition to the product [2].

Ethical considerations, particularly concerning animal welfare and hunting practices, further shape consumer segments. Studies by Marescotti et al. [11] and Fantechi et al. [24] highlight that animal welfare concerns significantly influence consumer attitudes, with those prioritizing animal rights favoring wild game meat over farmed alternatives. However, opposition to hunting complicates this preference, as some consumers support the consumption of game meat for its natural qualities but oppose hunting as a recreational activity [25,29].

Sociodemographic factors also play a crucial role in determining attitudes toward wild game meat. Men, more than women, tend to have positive attitudes toward its consumption, likely due to traditional gender roles and greater familiarity with hunting [24,30]. Consumers living in rural areas have easier access to hunting or social networks that offer game meat and therefore tend to have a more positive attitude [24,25]. Meanwhile, more educated consumers tend to express greater health concerns that influence their purchasing decisions [30].

Willingness to pay for wild game meat is closely linked to positive perceptions of its health and ethical attributes. Consumers who view game meat as nutritionally beneficial and ethically produced are more willing to pay a premium, as observed in the fearful consumer cluster identified by Niewiadomska et al. [30], which preferred high-quality game meat.

Consumers of game meat can be broadly categorized into three groups: positive, neutral, and negative, with significant variations in the relative size of each cluster across different studies. The positive cluster tends to be the largest, followed by the neutral and negative clusters, with notable variations depending on the study and region.

The positive cluster, which includes those who have a favorable view of game meat consumption, typically comprises between 33% and 64% of consumers. These individuals perceive game meat as a high-quality, healthy, and sustainable food source. Depending on the geographic context, this group can represent anywhere from one-third to two-thirds of the population. For instance, Demartini et al. [26] report that approximately 50% of consumers hold a positive attitude toward game meat, while Matilainen et al. [25] suggest the figure is closer to 33%.

The neutral cluster is characterized by consumers displaying ambivalence or uncertainty. These individuals may be open to consuming game meat but have reservations, often related to food safety concerns or a lack of knowledge. Studies have found this group ranges between 16% and 42% of consumers. Niewiadomska [30], for example, identifies 42% of respondents as "indifferent" to game meat, while Czarniecka-Skubina et al. [2] report similar figures for consumers who remain unconvinced.

Finally, the negative cluster, comprising those who oppose game meat consumption, represents a minority of the population, though it may account for up to 38% in some studies. Matilainen et al. [25] report that around 13% of consumers are skeptical, although other research has identified higher proportions, with opposition often stemming from ethical concerns or food safety issues.

This study sought to answer the following research questions:

RQ1: Is there a consumer segment that is more interested in game meat?

RQ2: Does the attitude towards game meat have an impact on consumer behavior when consuming game meat?

RQ3: Does the attitude towards hunting affect consumer behavior when consuming game meat?

RQ4: Do sociodemographic characteristics affect consumer behavior when consuming game meat?

## 3. Materials and Methods

### *3.1. Data Collection*

The survey was conducted online (Google Forms Platform) from 23 January to 17 February 2024. The questionnaire was distributed via social media platforms (Facebook and LinkedIn) and emailed directly to selected participants using a convenience sampling method. The time required to complete the questionnaire was 7–10 min. The final analysis was conducted with a sample of 603 respondents.

### *3.2. Questionnaire*

The first part of the questionnaire covers sociodemographic characteristics. Tables 1–4 cover the following areas, respectively: consumption behavior of game meat, attitude towards game meat, attitude towards hunting, and sociodemographic variables.

**Table 1.** Differences between segments regarding sample characteristics (N = 603).

| | | Total (%) | Cluster 1 (%) | Cluster 2 (%) | Cluster 3 (%) | *p*-Chi-Square Test |
|---|---|---|---|---|---|---|
| Gender | Male | 47.9 | 63.6 | 37.3 | 21.9 | <0.01 |
| | Female | 52.1 | 36.4 | 62.7 | 78.1 | |
| Age | 18–35 | 47.4 | 53.1 | 42.2 | 42.5 | >0.05 |
| | 36–55 | 45.6 | 41.6 | 49.6 | 47.9 | |
| | >55 | 7.0 | 5.2 | 8.2 | 9.6 | |
| Place of residence | Urban | 62.2 | 61.9 | 61.1 | 67.1 | >0.05 |
| | Rural | 37.8 | 38.1 | 38.9 | 32.9 | |
| Education | Elementary | 1.0 | 0.0 | 2.5 | 0.0 | <0.01 |
| | Secondary | 28.5 | 26.2 | 29.9 | 32.9 | |
| | University (bachelor's or master's level) | 53.4 | 61.5 | 45.1 | 49.3 | |
| | Postgraduate | 17.1 | 12.2 | 22.5 | 17.8 | |
| Household monthly income | <EUR 1500 | 27.7 | 25.2 | 29.1 | 32.9 | >0.05 |
| | EUR 1501–2500 | 35.0 | 35.7 | 33.6 | 37.0 | |
| | EUR 2501–3500 | 24.7 | 25.5 | 25.4 | 19.2 | |
| | >EUR 3500 | 12.6 | 13.6 | 11.9 | 11.0 | |
| Employment status | Student | 15.9 | 17.1 | 14.8 | 15.1 | >0.05 |
| | Employed | 76.9 | 78.0 | 77.0 | 72.6 | |
| | Unemployed | 4.3 | 2.4 | 5.7 | 6.8 | |
| | Retired | 2.8 | 2.4 | 2.5 | 5.5 | |
| Diet | Diverse diet | 98.3 | 100.0 | 100.0 | 86.3 | <0.05 |
| | Vegetarian | 0.7 | 0.0 | 0.0 | 5.5 | |
| | Vegan | 0.3 | 0.0 | 0.0 | 2.7 | |
| | Pescetarian | 0.7 | 0.0 | 0.0 | 5.5 | |
| Do you hunt? | Yes | 33.3 | 50.7 | 21.7 | 4.1 | <0.01 |
| | No | 66.7 | 49.3 | 78.3 | 95.9 | |
| Are any of your immediate family members hunters? | Yes | 37.1 | 46.2 | 29.9 | 26.0 | <0.01 |
| | No | 62.9 | 53.8 | 70.1 | 74.0 | |
| Are any of your friends hunters? | Yes | 71.6 | 84.6 | 64.3 | 45.2 | <0.01 |
| | No | 28.4 | 15.4 | 35.7 | 54.8 | |

**Table 2.** Differences in the game meat consumption behavior between segments (N = 603).

| | | Total (%) | Cluster 1 (%) | Cluster 2 (%) | Cluster 3 (%) | *p*-Chi Square Test |
|---|---|---|---|---|---|---|
| Have you consumed game meat in the last year? | Yes | 80.6 | 95.5 | 80.3 | 23.3 | <0.01 |
| | No | 19.4 | 4.5 | 19.7 | 76.7 | |

**Table 2.** *Cont.*

| | | | Total (%) | Cluster 1 (%) | Cluster 2 (%) | Cluster 3 (%) | *p*-Chi Square Test |
|---|---|---|---|---|---|---|---|
| How often have you consumed game meat in the last year? | I did not consume game meat in the last year | | 19.4 | 4.5 | 19.7 | 76.7 | <0.01 |
| | Several times a week | | 5.3 | 9.4 | 2.0 | 0.0 | |
| | Once a week | | 4.8 | 7.7 | 2.0 | 2.7 | |
| | Several times a month | | 15.9 | 24.8 | 9.4 | 2.7 | |
| | Once a month | | 9.3 | 12.2 | 8.2 | 1.4 | |
| | Several times a year | | 38.1 | 38.5 | 45.9 | 11.0 | |
| | Once in the last year | | 7.1 | 2.8 | 12.7 | 5.5 | |
| What game meat do you consume most often? | Red deer | yes | 36.5 | 51.7 | 26.6 | 9.6 | <0.01 |
| | | no | 63.5 | 48.3 | 73.4 | 90.4 | |
| | Roe deer | yes | 56.6 | 68.5 | 56.1 | 11.0 | <0.01 |
| | | no | 43.4 | 31.5 | 43.9 | 89.0 | |
| | Wild boar | yes | 68.7 | 87.1 | 62.3 | 17.8 | <0.01 |
| | | no | 31.3 | 12.9 | 37.7 | 82.2 | |
| | Rabbit | yes | 23.5 | 30.4 | 20.1 | 8.2 | <0.01 |
| | | no | 76.5 | 69.6 | 79.9 | 91.8 | |
| | Pheasant | yes | 24.7 | 33.2 | 20.5 | 5.5 | <0.01 |
| | | no | 75.3 | 66.8 | 79.5 | 94.5 | |
| How do you most often consume prepared game meat? | Roasted | yes | 34.3 | 50.7 | 23.4 | 6.8 | <0.01 |
| | | no | 65.7 | 49.3 | 76.6 | 93.2 | |
| | Stew | yes | 76.9 | 92.0 | 75.8 | 21.9 | <0.01 |
| | | no | 23.1 | 8.0 | 24.2 | 78.1 | |
| | Boiled | yes | 13.3 | 20.3 | 8.6 | 1.4 | <0.01 |
| | | no | 86.7 | 79.7 | 91.4 | 98.6 | |
| | Pâté | yes | 13.9 | 19.6 | 11.1 | 1.4 | <0.01 |
| | | no | 86.1 | 80.4 | 88.9 | 98.6 | |
| | Soup | yes | 20.2 | 28.7 | 15.2 | 4.1 | <0.01 |
| | | no | 79.8 | 71.3 | 84.8 | 95.9 | |
| | Cured products | yes | 46.6 | 62.9 | 38.9 | 8.2 | <0.01 |
| | | no | 53.4 | 37.1 | 61.1 | 91.8 | |
| On what occasions do you consume game meat? | With friends/family | yes | 56.7 | 69.2 | 53.7 | 17.8 | <0.01 |
| | | no | 43.3 | 30.8 | 46.3 | 82.2 | |
| | Celebrations | yes | 45.1 | 56.3 | 41.4 | 13.7 | <0.01 |
| | | no | 54.9 | 43.7 | 58.6 | 86.3 | |
| | Business occasion | yes | 14.4 | 19.2 | 12.3 | 2.7 | <0.05 |
| | | no | 85.6 | 80.8 | 87.7 | 97.3 | |
| | During hunting activities | yes | 23.5 | 37.8 | 13.1 | 2.7 | <0.01 |
| | | no | 76.5 | 62.2 | 86.9 | 97.3 | |
| | Regardless of the occasion | yes | 13.3 | 17.8 | 11.5 | 1.4 | <0.05 |
| | | no | 86.7 | 82.2 | 88.5 | 98.6 | |
| Where do you consume game meat? | In restaurants | yes | 20.7 | 26.2 | 19.3 | 4.1 | <0.01 |
| | | no | 79.3 | 73.8 | 80.7 | 95.9 | |
| | At home | yes | 64.8 | 83.2 | 57.8 | 16.4 | <0.01 |
| | | no | 35.2 | 16.8 | 42.2 | 83.6 | |
| | In hunting associations/communities | yes | 32.0 | 47.6 | 21.3 | 6.8 | <0.01 |
| | | no | 68.0 | 52.4 | 78.7 | 93.2 | |
| With whom do you most often consume game meat? | With family | yes | 70.0 | 83.9 | 68.9 | 19.2 | <0.01 |
| | | no | 30.0 | 16.1 | 31.1 | 80.8 | |
| | With friends | yes | 59.5 | 74.1 | 54.9 | 17.8 | <0.01 |
| | | no | 40.5 | 25.9 | 45.1 | 82.2 | |
| | With hunters | yes | 31.0 | 46.2 | 21.7 | 2.7 | <0.01 |
| | | no | 69.0 | 53.8 | 78.3 | 97.3 | |
| What is the origin of the game meat you consume most often? | Domestic | | 98.8 | 98.5 | 99.0 | 100.0 | >0.05 |
| | Foreign | | 1.2 | 1.5 | 1.0 | 0.0 | |

**Table 3.** Respondent attitudes toward game meat by segment.

| | Total | Cluster 1 | Cluster 2 | Cluster 3 | |
|---|---|---|---|---|---|
| | **Mean * (SD)** | **Mean * (SD)** | **Mean * (SD)** | **Mean * (SD)** | ***p*-ANOVA** |
| I have a positive attitude towards game meat. | 4.21 (1.05) | 4.91 (0.32) | 3.97 (0.73) | 2.29 (1.05) | <0.01 |
| Game meat has a positive effect on my health. | 3.72 (1.11) | 4.50 (0.77) | 3.28 (0.67) | 2.14 (0.92) | <0.01 |
| I like to eat game meat. | 4.00 (1.22) | 4.86 (0.39) | 3.77 (0.63) | 1.37 (0.51) | <0.01 |
| I like the smell of game meat. | 3.67 (1.22) | 4.56 (0.67) | 3.30 (0.69) | 1.45 (0.65) | <0.01 |
| I like the taste of game meat. | 3.98 (1.20) | 4.84 (0.39) | 3.75 (0.60) | 1.38 (0.52) | <0.01 |
| Game meat is rich in protein. | 4.18 (0.91) | 4.80 (0.46) | 3.75 (0.61) | 3.14 (1.24) | <0.01 |
| Game meat is low in fat. | 3.88 (1.00) | 4.48 (0.78) | 3.47 (0.69) | 2.86 (1.11) | <0.01 |
| Game meat has a favorable content of essential amino acids. | 3.79 (0.97) | 4.38 (0.80) | 3.41 (0.61) | 2.74 (1.01) | <0.01 |
| Game meat is rich in vitamins. | 3.72 (0.98) | 4.35 (0.82) | 3.30 (0.59) | 2.67 (0.93) | <0.01 |

* Based on a 5-point Likert scale where 1 indicates completely disagree and 5 indicates completely agree.

**Table 4.** Respondent attitudes toward hunting by segment.

| | **Total Mean * (SD)** | **Cluster 1 Mean * (SD)** | **Cluster 2 Mean * (SD)** | **Cluster 3 Mean * (SD)** | ***p*-ANOVA** |
|---|---|---|---|---|---|
| I have a positive attitude about hunting. | 3.55 (1.37) | 4.29 (1.05) | 3.18 (1.17) | 1.93 (1.16) | <0.01 |
| I do not see anything wrong with hunting animals for their meat as long as the animal is not endangered. | 3.80 (1.28) | 4.44 (0.99) | 3.51 (1.02) | 2.25 (1.41) | <0.01 |
| Hunting helps maintain the balance in nature. | 3.92 (1.19) | 4.55 (0.83) | 3.63 (0.97) | 2.41 (1.35) | <0.01 |
| Most hunters are well-prepared when they go hunting. | 3.27 (1.07) | 3.50 (1.10) | 3.14 (0.94) | 2.82 (1.11) | <0.01 |
| Hunters are well-trained and follow hunting regulations. | 3.22 (1.14) | 3.54 (1.14) | 3.09 (0.95) | 2.42 (1.28) | <0.01 |
| Hunting is an important rural tradition. | 3.58 (1.24) | 4.10 (1.17) | 3.38 (0.90) | 2.21 (1.24) | <0.01 |
| I consider any form of sport–recreational hunting to be cruel to animals. (RECOD) | 3.57 (1.36) | 4.03 (1.27) | 3.26 (1.22) | 2.79 (1.55) | <0.01 |
| Hunters often injure animals, which then die a slow and painful death. (RECOD) | 3.55 (1.11) | 3.80 (1.17) | 3.41 (0.95) | 3.08 (1.18) | <0.01 |
| Hunters often ignore safety rules. (RECOD) | 3.40 (1.12) | 3.65 (1.18) | 3.24 (0.94) | 2.92 (1.24) | <0.01 |
| I don't like people who hunt animals. (RECOD) | 4.01 (1.12) | 4.43 (1.02) | 3.80 (0.96) | 3.14 (1.31) | <0.01 |

* Based on a 5-point Likert scale where 1 indicates completely disagree and 5 indicates completely agree.

The second part of the questionnaire examined game meat consumption behavior (Have you consumed game meat in the last year?, How often have you consumed game meat in the last year?, Which game meat do you consume?, How do you prepare game meat?, Where do you usually eat game meat?, On what occasions do you consume game meat?, With whom do you consume game meat?, and What is the origin of the game meat you consume?).

Attitudes toward game meat were measured using nine items adapted from Corradini et al. [22]. Attitudes toward hunting were assessed using four items derived from Ljung et al. [31]. Attitudes toward game meat and attitudes toward hunting were assessed using a 5-point Likert scale, with responses ranging from "strongly disagree" (1) to "strongly agree" (5).

### *3.3. Data Analysis*

The collected data were coded and entered into the SPSS program (Statistical Package for Social Science, Version 21.0). Univariate analysis (frequencies) was used to analyze the sample characteristics and behavior regarding game meat consumption. Respondent attitudes towards game meat were used as the basis for market segmentation, which was conducted using hierarchical cluster analysis (HCA) [32].

HCA is a statistical technique used to group individuals into distinct segments based on their similarities. In this case, it was used to identify groups of consumers with similar attitudes towards game meat. Unlike methods that require pre-specifying the number of groups, HCA is a bottom-up approach where every individual starts as its own cluster. The algorithm then merges the closest clusters, based on a selected criterion, and repeats this process until all respondents are grouped into a hierarchy. In the context of this study, Ward's method was used, which minimizes the total variation within the clusters and optimizes their homogeneity. The squared Euclidean distance was employed to measure the similarity between respondents, which is based on the sum of squared differences between their characteristics [32]. Discriminant analysis was used to evaluate how well the clusters are differentiated based on specific items which were used for attitudes about game meat measurement [32].

After the clusters were formed, the resulting consumer segments were further described based on their sociodemographic characteristics (e.g., age, education), their experience with hunting, and their consumer behavior with respect to game meat consumption. We also explored their attitudes towards game meat and hunting to gain a deeper understanding of each segment.

To examine whether there were significant differences between the identified segments, we used comparative statistical analyses, including the chi-square test and analysis of variance (ANOVA). These tests helped us determine if sociodemographic factors and behavioral characteristics varied significantly across the different consumer segments.

Figure 1 illustrates the study workflow, outlining each step of the research process.

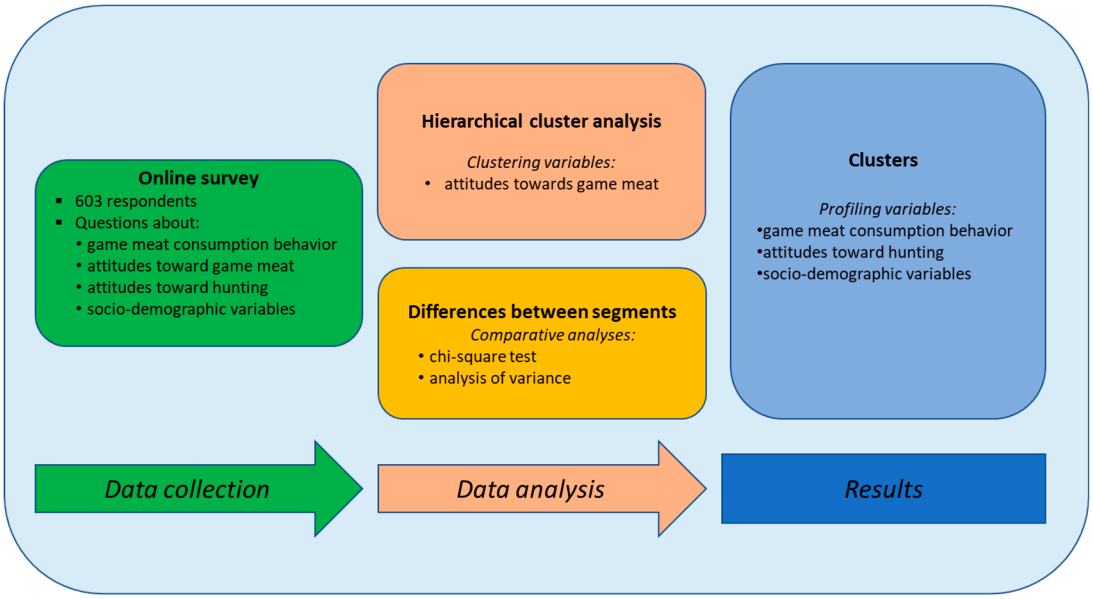


**Figure 1.** Illustration of the study workflow.

## 4. Results

### *4.1. Sample Characteristics and Behavior in Game Meat Consumption*

The sample characteristics are presented in Table 1. The sample is representative of the Croatian population in terms of gender. However, it should be noted that the age distribution is not fully representative, as the survey was conducted online, which may have led to an overrepresentation of younger participants. The sample also shows a high level of education, with a significant majority being employed (76.9%), and predominantly residing in urban areas (62.2%). Additionally, most respondents report consuming all types of food (98.3%), do not engage in hunting (66.7%), but have friends who do hunt (71.6%). Furthermore, hunters are overrepresented in the sample compared to the number of hunters in the Croatian population.

Around 80% of respondents have eaten game meat in the last year. Most reported eating game meat several times in the last year (38.1%), while only 5.3% of respondents ate game meat once a week in the last year (Table 2).

Respondents most frequently consumed meat of wild boar (68.7%), roe deer (56.6%), red deer (36.5%), pheasant (24.7%), and rabbit (23.5%). When they eat game meat, they most frequently eat game meat in the form of a stew (76.9%) or cured products (46.6%). Most respondents eat game meat together with friends/family (56.7%), at celebrations such as birthdays or anniversaries (45.1%), or when hunting (23.5%). Game meat is most frequently eaten at home (64.8%) or in hunting associations/communities (32.0%), mostly with family members (70%) and friends (59.5%). As many as 98.8% of respondents ate game meat from domestic production.

### *4.2. Consumer Segmentation and Description of Obtained Segments*

HCA was conducted to identify homogeneous groups of respondents based on their attitudes towards game meat. The analysis included nine items that assessed different dimensions of respondent attitudes towards game meat, and it resulted in the identification of three distinct clusters.

The identified market segments were named and interpreted based on the original variables (attitudes toward game meat), game meat consumption behavior, attitudes toward hunting, and various sample characteristics (such as gender, age, education, place

of residence, employment status, household income, dietary preferences, and whether respondents or their friends and family members are involved in hunting).

The three identified market segments were named and characterized as follows.

#### 4.2.1. Cluster 1: Game Meat Lovers

Game meat lovers represent the largest segment, with 47.4% of all respondents. Males make up 63.6% of this segment, half of whom are hunters, and a high share of their close family members (46.2%) and friends (84.6%) are hunters. A higher share of this group hold bachelor's or master's degrees (61.5%) (Table 1).

The highest share of game meat lovers consumed game meat more frequently in the last year (with 24.8% consuming game meat several times per month). Next, the highest number of respondents in this segment consume all types of game meat (red deer, roe deer, wild boar, rabbit, and pheasant). Compared to other two segments, a higher share of game meat lovers consume different dishes prepared from game meat (stew, roasted, boiled, pâté, soups, and cured products). Consumers in this segment have the highest share of respondents who consume game meat with friends/family members, during celebrations or business occasions, and during hunting activities, but also regardless of occasion. They mostly consume game meat at home (83.2%) but there is also a high share of game meat lovers who eat game meat in hunting associations (47.6%) and in restaurants (26.2%). Most consume game meat with family members (83.9%) and friends (74.1%), while 46.2% of game meat lovers eat game meat with hunters (Table 2).

Game meat lovers have very positive attitudes about game meat. They like to eat game meat (mean 4.86) and like its taste (4.84). Furthermore, they consider game meat as rich in protein (mean 4.80) and having a positive effect on health (mean 4.50) (Table 3).

Respondents from this segment have positive attitudes about hunting (mean 4.29) and believe that hunting helps maintain the balance in nature (mean 4.55). Furthermore, they do not see anything wrong with hunting animals for their meat as long as the animals are not endangered (mean 4.44) (Table 4).

#### 4.2.2. Cluster 2: Occasional Game Meat Consumers

This segment comprises 40.5% of all respondents. A higher proportion of respondents in this segment are women with a higher education who do not hunt and whose close family members are not hunters.

In this group, 80.3% of occasional game meat consumers have consumed game meat in the last year, mostly several times a year. They most often consume wild boar and roe deer game meat. As in other segments, 99% of consumers in cluster 2 consume game meat of domestic origin.

Occasional game meat consumers have neutral to slightly positive attitudes about game meat. They are neutral regarding the positive effect of game meat consumption on health, and the taste and smell of game meat. Similarly, they have neutral attitudes toward hunting (Hunters are well-trained and follow hunting regulations—mean 3.09; I have a positive attitude about hunting—mean 3.18).

#### 4.2.3. Cluster 3: Game Meat-Averse Consumers

Consumers who do not like game meat are the smallest segment, accounting for 12.1% of all respondents. Compared to the other two segments, consumers in this segment have the highest proportion of women living in urban areas and older respondents with higher education and a lower monthly income. In addition, the proportion of unemployed and retired consumers is highest in cluster 3. In this segment, there are some respondents who follow a vegetarian, vegan, or pescetarian diet. Indeed, 95.9% of these consumers who

reject game meat do not hunt, with a lower proportion of respondents whose close family members or friends are hunters.

The majority of respondents who are game meat-averse consumers have not consumed game meat in the last year. They have a negative attitude towards game meat (I have a positive attitude towards game meat—mean 2.29) and do not like to eat game meat. In addition, consumers in this segment do not like the taste or smell of game meat.

## 5. Discussion

Previous studies on game meat observed varying frequencies of consumption among respondents [2,33]. Accordingly, the results of this study also confirm earlier scientific studies. The majority ate game meat only a few times a year. This study also demonstrates that wild boar is the most commonly consumed type, followed by roe deer and red deer meat. This preference for large game over small game, such as pheasant and rabbit, suggests a clear trend. Similarly, Riedl et al. [34] identified wild boar and red deer as the most frequently consumed game meats. Notably, 98.8% of respondents reported consuming game meat sourced from domestic production. This preference aligns with earlier findings by Tolušić et al. [19], who concluded that consumers generally favor meat from domestically raised animals.

This survey identified three distinct consumer segments in game meat consumption. The first and largest segment, referred to as "game meat lovers", represents a significant proportion of respondents. This result aligns with previous studies, which found that the proportion of consumers in the positive cluster of game meat consumption ranged between 33% and 64% [2,24–26,33]. For instance, Demartini et al. [26] found that approximately 50% of consumers hold a favorable attitude toward game meat.

Numerous previous studies, e.g., [19,23,26], have highlighted the influence of socioeconomic factors on understanding game meat consumer behavior. This study reinforces those findings and further expands the existing body of knowledge on the importance of socioeconomic factors. The higher proportion of males in the Game Meat Lovers segment may be attributed to traditional gender roles, cultural norms, and men's greater familiarity with hunting practices [24,33]. Furthermore, Marescotti et al. [27] found that Italian males expressed higher confidence in the safety of game meat consumption. On the other side, Clusters 2 (Occasional Game Meat Consumers) and 3 (Game Meat-Averse Consumers) include a higher proportion of female respondents. This aligns with findings from Tomašević et al. [23], which revealed that females across Europe tend to consume game meat less frequently than males. Niewiadomska et al. [30] noted that females have higher fears about game meat consumption, which is related to parasite infections and zoonoses, but also with gaining weight or increasing their cholesterol level as a result of eating game meat. The Game Meat Lovers segment has a higher proportion of respondents with higher education levels. These results are consistent with research by Niewiadomska et al. [33], which found that educated consumers are more likely to prioritize health concerns in their purchasing decisions, leading to a greater likelihood of consuming game meat. The highest proportion of hunters, or individuals with close family members and friends who hunt, is found among game meat lovers [35]. This aligns with previous research indicating that hunters are significantly more likely to consume game meat [36,37]. Krokowska-Paluszak et al. [37] also highlighted that having parents or friends who hunt serves as a key positive influence on attitudes toward hunting and game meat consumption.

Various segmentation criteria are discussed in the marketing literature, particularly psychographic measures such as attitudes and values. In all cases, it is assumed—though not always empirically validated—that segments differ in their responses to marketing parameters, especially in their preferences for products introduced to the market [38]. This

study confirms the importance of product-specific attitudes. As expected, game meat lovers exhibit more positive attitudes toward both game meat and hunting compared to other segments. Similarly, Matilainen et al. [25] found that the segment labeled "hunted wild game meat eaters" held strong positive attitudes toward consuming hunted game meat products, while Corradini et al. [22] concluded that positive attitudes toward hunting are linked to higher game meat consumption.

## 6. Implications, Conclusions, and Limitations

### *6.1. Implications*

The segmentation of consumers based on their attitudes toward game meat provides valuable insights into consumer preferences and consumption patterns, which can be applied in various domains, including marketing, public policy, and sustainability initiatives.

Hunters play a central role in the game meat supply chain, serving as both primary suppliers and key actors in wildlife management. The study highlights the importance of ethical hunting practices in shaping public perceptions of game meat. Addressing negative attitudes among the game meat-averse consumer segment necessitates a commitment to sustainable hunting practices, alongside efforts to educate the public on the role of hunting in ecosystem management. Direct consumer engagement through workshops and public initiatives could foster trust and counteract negative stereotypes. Additionally, strengthening hunting associations and cooperatives could professionalize the game meat supply chain, improving standardization and enhancing consumer confidence.

Retailers and food businesses also have a pivotal role in shaping market dynamics. By diversifying product offerings to include both traditional and innovative game meat products, such as ready-to-cook meals, retailers could appeal to both frequent consumers and those hesitant to try game meat. Moreover, clear labeling, sustainability certifications, and promotional efforts that emphasize the benefits and ethical sourcing of game meat could encourage broader consumer acceptance, including among those who currently perceive it with skepticism.

The foodservice industry presents another opportunity to increase consumer exposure to game meat. Featuring game meat in gourmet dishes, collaborating with chefs to highlight its unique flavors, and incorporating it into food festivals or tasting events could help normalize its consumption and attract new consumer segments. Additionally, partnerships between restaurants and local hunters or suppliers could reinforce the sustainability narrative, adding value to the product and appealing to environmentally conscious diners. Expanding game meat offerings in institutional catering, such as school and workplace canteens, could also serve as an effective strategy to familiarize the public with game meat.

From a supply chain perspective, improving distribution networks is essential to expanding the market reach of game meat. Efficient cold chain logistics, increased retail availability, and integration into e-commerce platforms could enhance accessibility, particularly for urban consumers who may not have direct access to hunting associations or specialty stores. Furthermore, investments in quality control and transparency—such as implementing certification schemes for ethically sourced game meat—could bolster consumer confidence and strengthen the market's long-term viability.

From a policy standpoint, the findings emphasize the need for targeted interventions that consider both sustainability and consumer demand. Given the ecological benefits of game meat, public policies should support initiatives that include educational campaigns to raise consumer awareness, financial incentives for sustainable hunting practices, and measures to ensure transparent sourcing and traceability. Moreover, policies that reinforce the domestic supply chain—such as support for local hunting communities—could enhance the availability and accessibility of game meat products.

Consumer education is a critical factor in shaping attitudes toward game meat. Many of the barriers to consumption identified in this study, such as concerns about taste, food safety, and ethical sourcing, can be mitigated through awareness campaigns. Utilizing multiple communication channels, including social media and culinary programming, could help reshape consumer perceptions and encourage greater acceptance of game meat. Additionally, providing information on the nutritional benefits of game meat—such as its high protein content and favorable n−6/n−3 fatty acid ratio—could further support its positioning as a desirable food option.

### *6.2. Conclusions*

This study extends the existing literature on game meat consumers by showing how attitudes towards game meat shape different consumer segments. Furthermore, it highlights the influence of hunting-related attitudes, hunting experiences, and sociodemographic factors in distinguishing these segments, thus providing deeper insights into the characteristics of game meat consumers.

Focusing on Croatia, this study identifies three distinct market segments with varying degrees of acceptance and consumption frequency. While a substantial portion of the population actively consumes game meat, a large group remains indifferent, and a smaller yet notable segment actively avoids it.

Overall, the findings highlight the need for a multidimensional approach to game meat marketing and policy development. By considering the diverse preferences and concerns of different consumer segments, stakeholders can formulate targeted strategies that promote game meat consumption while addressing sustainability, ethical considerations, and consumer trust.

The findings from this study can also be extrapolated to other countries with similar dietary and cultural contexts, particularly within Europe and other regions with established traditions of game hunting and consumption. For instance, countries like Italy, France, Spain, and the UK have a long-standing culture of game meat consumption, and the consumer segments identified in this study may resonate with consumers in these countries, though cultural differences should be considered. The approach used in this study could be adapted to investigate consumer preferences in these countries, using similar clustering methods to identify and target specific market segments.

### *6.3. Limitations*

While this study enhances the existing literature on game meat by exploring consumer segmentation and providing deeper insights into the pivotal role of attitudes in game meat consumption, it is not without its limitations. Firstly, we used an online survey, which presents the potential for selection bias. Secondly, the sample included a high share of hunters, which may have skewed the results toward more favorable attitudes and behaviors related to game meat consumption. Thirdly, the sample was not representative of the general population of Croatia, which further constrains the applicability of the results to other regions or demographic groups. Finally, consumer behavior in game meat consumption was measured through self-reported data rather than objective techniques (food diaries or direct observation), which could lead to over- or under-estimation of actual game meat consumption.

Future research should aim to include larger and more representative samples to ensure the broader applicability of the findings. Furthermore, exploring additional psychological variables, such as consumer knowledge and perceptions of food safety, could provide a more comprehensive understanding of the factors influencing game meat consumption. Finally, a comparative analysis between countries could enhance the understanding of cul-

tural and regional variations in game meat consumption. Such studies would help identify best practices and potential market expansion opportunities for game meat producers.

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