Economia agro-alimentare /
Food Economy

An International Journal on Agricultural and Food Systems

Vol. 28, Iss. 1, Art. 5, pp. 155-181 - ISSNe 1972-4802
DOI: 10.3280/ecag2026oa20838

Consumer segments and determinants shaping meat consumption in Slovakia

Kristína Predanócyová[a], Peter Šedík[b], Cristina Bianca Pocol[*,c], Mihaela Mihai[c], Ľubica Kubicová[b]

[a] AgroBioTech Research Centre, Slovak University of Agriculture in Nitra, Slovakia
[b] Faculty of Economics and Management, Slovak University of Agriculture in Nitra, Slovakia
[c] University of Agricultural Sciences and Veterinary Medicine of Cluj Napoca, Romania

Abstract

The paper focuses on the analysis of meat consumption patterns and the level and structure of consumption of individual types of meat, on segmenting consumers according to consumption patterns and determining the key factors affecting meat consumption. The study is based on data obtained through an electronic questionnaire survey conducted in 2020 on a sample of 1,409 Slovak consumers. Descriptive statistics, cluster analysis and principal component analysis (PCA) were used to process the data. The results indicate a relatively high overall meat consumption, but with an unbalanced structure between individual types of meat. Based on these consumption patterns, four consumer segments were identified: consumers preferring poultry meat, consumers with a high consumption of all types of meat, consumers oriented mainly towards pork meat and consumers combining poultry meat and pork meat. The analysis of factors affecting meat consumption identified three main components. The first component represents a key factor, including items such as freshness, quality, aroma, meat content, appearance, country of origin, perishability, previous experiences, price, producer and health aspects. The second component represents a composition factor, consisting of factors related to nutritional attributes. The last component is a sales and promotion factor, related to product availability, packaging, and marketing attributes. The study provides insights for the food and meat processing industry in creating targeted marketing strategies related to health and sustainable aspects of consumption, as well as for public policymakers. Results also contribute to expanding the existing theoretical framework in the field of consumer behavior.

Article info

Type:
Article
Submitted:
10/08/2025
Accepted:
09/03/2026
Available online:
07/04/2026

JEL codes:
Q13, M31, M21

Keywords:
Meat
Meat products
Consumption
Consumer segments
Factors

* *Corresponding author*: Cristina Bianca Pocol - University of Agricultural Sciences and Veterinary Medicine of Cluj Napoca, Romania. E-mail: cristina.pocol@usamvcluj.ro.

Introduction

The current meat industry is undergoing important changes, influenced by market trends related to environmental, ethical, social and health aspects of meat production and consumption. Consumer interest in sustainability and concerns about climate change are leading to ecological solutions and fuelling the debate about responsible meat consumption. Meat is considered an important part of the human diet and plays a key role in nutrient intake (Collier *et al*., 2021). From a nutritional point of view, meat is a valuable source of high-quality protein, minerals, especially iron, zinc and selenium, B-complex vitamins, but also various bioactive compounds such as taurine, carnitine, carnosine, ubiquinone, glutathione and creatine, which are involved in several metabolic processes (Geiker *et al*., 2021; Wood, 2023). Due to its nutritional composition, meat contributes to proper human development and is an important part of a balanced and healthy diet (Stadnik, 2024; Leroy *et al*., 2023), especially during childhood and adolescence (Almeida *et al*., 2023). Meat and meat product consumption has a significant impact on consumer health, the environment and the food system. Consumer decisions, therefore, significantly influence the demand and shape of the meat market. However, for a comprehensive understanding of meat consumption patterns and factors influencing consumer behaviour, systematic research on this issue is necessary.

1. Background

Meat consumption contributes to the reduction of nutritional deficiencies, thereby supporting human health and immunity (Singh *et al*., 2023). Some studies aimed at meat health effects point to a connection between the exclusion of meat from the diet and an increased risk of certain health problems related to the human psyche, such as depression, anxiety and self-harm (Dobersek *et al*., 2020). On the other hand, some studies point to a negative impact on consumer health resulting from excessive meat consumption, particularly processed meat products. The relationship between the consumption of unprocessed red meat and the risk of various chronic diseases, especially cancer, cardiovascular diseases and type 2 diabetes, was examined in a study by Lescinsky *et al*. (2022), which showed that excessive meat consumption may be associated with an increased risk of the aforementioned diseases. However, it is important to emphasize that the relevant evidence for the claims is still weak, because a high degree of heterogeneity between studies, related to differences in the consideration of factors such as gender, age, smoking, other dietary habits, meat preparation

method, socioeconomic status and regional dietary habits. Based on the above, these factors could be key determinants influencing the relationship between meat consumption and human health (Lescinsky *et al.*, 2022). Additional studies show that an increased risk of developing or worsening certain chronic diseases, especially cancer, cardiovascular disease, type 2 diabetes, obesity, inflammatory bowel disease, non-alcoholic fatty liver disease, and fertility disorders, is associated with excessive consumption of processed red meat (Libera *et al.*, 2021). Although meat has an important place in human nutrition, in recent years, the topic of meat consumption and its effects on health has become very controversial and discussed in the public sphere (Nungesser and Winter, 2021; Parlasca and Qaim, 2022). The meat industry faces various challenges associated with social demands and criticism (Chaib *et al.*, 2023), while the discussions touch not only on the health aspects of consumption, but also on the environmental issues of production and consumption (Font-i-Furnols, & Guerrero, 2022). Moreover, current consumer trends, changing eating habits and the focus on healthy or sustainable diet further highlight these challenges, which have an important influence on consumer perception and decisions (Veiga *et al.*, 2023; Font-i-Furnols, & Guerrero, 2022). Clare *et al.* (2022) point out that the manner and content of information that meat industry actors communicate to consumers can significantly influence perceptions of the health and environmental aspects of meat consumption and the formation of dietary patterns. The authors also state that scientific knowledge about health and environmental risks can be questioned and the benefits of consuming meat and meat products can be emphasized. However, according to a wide array of studies, increasing meat and meat product consumption leads to environmental risks (Turnes *et al.*, 2023). Valli *et al.* (2022) identified that consumers' concerns related to the impact of meat production and distribution on the environment can significantly determine consumer choice. High meat consumption is associated with negative environmental consequences (Markoni *et al.*, 2023), mainly because meat production is one of the biggest contributors to global warming and environmental degradation (Stewart *et al.*, 2021). Henry *et al.* (2019) add that the meat industry is one of the most significant drivers of global deforestation and biodiversity loss. Furthermore, it has been stated that animal-based food products have a high ecological footprint (Marinova, & Bogueva, 2019) and are responsible for more than half of greenhouse gases from all agri-food sector producers (Crippa *et al.*, 2021). Moreover, increasing meat production does not have a positive impact on the environment mainly due to antibiotics, but also pesticides used in the production of plants intended for animal fattening (Marzban *et al.*, 2023). Excessive meat production also contributes to environmental changes and negatively affects animal welfare, greenhouse gas emissions, land and water

use (Van der Weele *et al*., 2019). Furthermore, in recent years, there have been strong public concerns about animal welfare (Gebska *et al*., 2020) as well as a growing interest among consumers in supporting sustainable food systems (Garcez de Oliveira Padilha *et al*., 2021). As such, in order to support sustainable meat production, organic meat alternatives are made available to consumers (Font-i-Furnols, 2023). However, it is also necessary to highlight the positive environmental effects of livestock, especially in well-managed agroecological systems. Livestock can convert non-edible biomass, return plant nutrients into the land, increase soil fertility and sequestrate carbon, so these systems can improve overall ecosystem services (Thompson *et al*., 2023). Traditional pastoral socio-ecological systems can also provide significant environmental benefits. Fernandez-Gimenez *et al*. (2022) emphasize that these systems support a variety of ecosystem services, including biodiversity conservation, soil health maintenance and sustainable land use. Certain studies also highlight the positive ecological aspects of traditional livestock farming. Troiano *et al*. (2021) show that traditional free-range livestock can help maintain the biodiversity of mountain pastures and stabilize the structure of plant and animal communities. Nevertheless, for the time being, the current level of global meat consumption is not consistent with the goals of sustainable food systems. In addition, global demand for meat is expected to continue to grow, which may increase pressure on the environment (Hayek *et al*., 2021; Springmann *et al*., 2016; Williams *et al*., 2021; Parlasca, & Qaim, 2022).

Sustainable food systems in the context of the meat market clearly relate to changing meat consumption patterns. Reducing meat consumption, especially red processed meat, can subsequently have a positive impact on the environment, animal welfare, but also on consumer health. This shift can be a tool for reducing negative environmental impacts related to climate change (Ivanova *et al*., 2020) and biodiversity loss (Selinske *et al*., 2020), but also for preventing health problems (Willett *et al*., 2019), particularly in high-income countries (Sun *et al*., 2022). In addition, the availability of healthy, high-quality and safe meat can also contribute to sustainable consumer behaviour in the meat market (Yang, 2022). In this context, Oliveira *et al*. (2021) find that beef meat produced in mountain areas is perceived by consumers as more natural, higher quality and healthier.

Changing eating habits are linked with reducing meat and meat products consumption and supporting the consumption of healthy and sustainable foods (Lourenco, 2022). The meat industry can be significantly affected by the consumer trend of flexitarianism, which is related to the conscious reduction in meat consumption and partial replacement with other meat substitutes, mainly plant-based which have similar sensory properties to meat and respond to changing consumer needs adhering to sustainable principles

(Andreani *et al.*, 2023). Croney and Swanson (2023) emphasize that the complete exclusion of meat and meat products from the diet is not appropriate and can cause negative consequences for human health, but also for food equality, justice and the economic viability of actors in the meat market. However, meat is an important part of human diets, and thus, for achieving changes in eating habits, it is crucial to understand individual consumer behavior (Szczebyło *et al.*, 2022). Meat consumers and their future behavior are determined by many factors, and it is therefore necessary to understand their current preferences and consumption patterns.

In the context above, the consumption of meat and meat products is debatable, especially from the perspective of health and sustainability, as well as future developments and expectations regarding increasing consumption. Against this background, the paper examines meat consumption patterns in the Slovak Republic, focusing on consumer segmentation according to the consumption of individual types of meat, as well as factors influencing current meat consumption. This intention provides novelty and fills a research gap, especially in identifying different consumer segments based on the level of meat consumption with respect to individual types of meat, poultry, pork and beef. The theoretical contribution of the research is a comprehensive understanding of the dynamics of consumer behavior on the Slovak meat market. The research extends existing theories of consumer behavior with new segmentation approaches in meat consumption and identifies key factors determining consumer behavior based on answers to the following research questions:

Research question no. 1: What is the consumption of meat and meat products by Slovak consumers, categorized by individual types of meat?

Research question no. 2: What are the key factors influencing the purchase and consumption of meat and meat products?

2. Materials and methods

2.1. *Data collection*

The study is based on data obtained through a consumer survey aimed at exploring meat and meat products consumption patterns by different types of meat. The research also included the identification of consumer clusters with regard to the level of consumption of different types of meat and meat products.

The consumer survey was conducted on a sample of 1,409 respondents in Slovakia in 2020. Respondents were invited to participate in the survey via an electronic questionnaire using Google Forms and distributed by emails and

social media. The snowball sampling method was used for data collection. The sample is characterized by a higher representation of younger, urban, and more educated respondents compared to national demographic statistics, reflecting the online data collection method. Respondents involved in the questionnaire survey were divided into seven categories (Table 1).

Table 1 - Socio-demographic profile of sample

Socio-demographic characteristics		*%*
Gender	Women	58.98
	Men	41.02
Age	18-25 years	38.82
	26-35 years	22.07
	36-50 years	21.79
	Over 51 years	17.32
Education	Elementary	3.41
	Secondary	47.48
	University	49.11
Residence	Rural	45.49
	Urban	54.51
Economic status	Employed	48.90
	Entrepreneur	8.87
	Student	31.16
	Retired	7.59
	Unemployed	0.78
	Maternity leave	2.70
Number of household members	1 member	5.82
	2 members	20.30
	3 members	27.33
	4 members	30.02
	5 members	11.92
	More than 5 members	4.61
Monthly household income	Up to 1,000 euros	17.74
	1,001-2,000 euros	49.61
	2,001-3,000 euros	23.70
	3,0001-4,000 euros	4.83
	More than 4,001 euros	4.12

Source: Own research.

2.2. *Measures and analysis*

The questionnaire was developed specifically for this study based on previous literature and studies on meat consumption and consumer behavior (Font-i-Furnols, & Guerrero, 2014; Popescu, 2013). Respondents reported the average number of portions of different types of meat and meat products consumed per week (Table 2). Based on these data, weekly consumption in grams was calculated for each respondent and then converted to annual consumption for different types of meat. Consumption was therefore assessed separately for each type of meat and meat products. Subsequently, consumption of meat and meat products by different types of meat was compared with the recommended consumption regarding the health recommendations, which are set by the Public Health Authority of the Slovak Republic. The annual reccomended consumption for pork meat is 22.2 kg, for poultry is 15.0 kg, and for beef meat is 17.4 kg. Based on this comparison, respondents were categorized according to whether they had an insufficient level of consumption (below the recommended doses), adequate consumption (±10% of recommended doses) or excessive consumption of different

Table 2 - Standardized portion sizes used for measuring meat consumption

Meat product	**Portion size**
Poultry meat	150 grams
Beef meat	150 grams
Pork meat	150 grams
Poultry sausages	150 grams (approx. 4 pieces)
Beef sausages	150 grams (approx. 4 pieces)
Pork sausages	150 grams (approx. 4 pieces)
Fish	150 grams
Poultry ham	50 grams
Pork ham	50 grams
Salami	50 grams
Traditional sausages	50 grams
Bacon	50 grams
Canned meat (predominantly pork)	150 grams
Canned meat (predominantly poultry)	150 grams
Fish canned	150 grams

Source: Own research.

types of meat (above the recommended doses). The obtained data became a prerequisite for creating consumer segmentation and profiling of individual segments.

The survey also focused on exploring factors influencing the purchase and consumption of meat and meat products, and included 24 factors that were selected by the authors based on previous studies (Font-i-Furnols, & Guerrero, 2014; Pourová, & Stehlík, 2002; Udomkun *et al*., 2018; Predanocyová *et al*., 2018) and their own ideas, considering the strong meat culture among Slovak consumers. The factors were evaluated on a 10-point scale with 1 representing no importance and 10 high importance, which provides greater differentiation of respondents' attitudes compared to 5- or 7-point scales and have also been used by other authors (Stávková *et al*., 2018; Antošová, & Stávková, 2023). The evaluated factors were freshness of the product, quality, product fragrance, meat content, product appearance, country of origin, perishablility, previous experience, price, manufacturer, health aspect, saturated fatty acid content, salt content, nitrate content, water content, fat content, energy value, protein content, content of emulsifiers, product promotion, appearance of the packaging, package size, preparation speed and ecological aspect (organic food).

Data were processed using Microsoft Excel and evaluated in the statistical programs IBM SPSS and XLSTAT 2022.4.1. PCA was used to reduce the number of examined components in the set of observed data. The correlation matrix was appropriate for component extraction before extraction, according to the Kaiser-Meyer-Olkin (KMO) measure, which demonstrated excellent sampling adequacy (KMO = 0.954) and Bartlett's test of sphericity, which was statistically significant ($p < 0.001$). To improve the interpretability of the component structure, the solution was rotated using Varimax rotation with Kaiser normalization. Additionally, the scale demonstrated feasible internal consistency with a Cronbach's alpha of 0.959, proving the validity of the construct being measured.

To determine consumer segments based on distance from the recommended intake of selected types of meat (poultry, beef and pork meat), a two-step cluster analysis was conducted. A maximum of 15 clusters were tested, and the number of clusters was automatically calculated using Bayesian Information Criterion (BIC) and the log-likelihood distance measure. With an average silhouette of 0.60, the final solution showed good cluster quality, indicating satisfactory separation and cohesion. According to predictor values, the strongest discriminating variable was poultry (1.00), followed by beef (0.85) and pork (0.68). Subsequently, chi-square test of independence was utilized to study whether demographic characteristics significantly differed among the identified segments. A similar approach was implemented in other studies (Šedík *et al*., 2019; Mackenzie *et al*., 2025).

3. Results

3.1. *Meat consumption and meat consumer segments in Slovakia*

The results of the study showed that in the Slovak Republic, meat culture is prevalent, as only 2.48% of consumers do not consume any type of meat. The amount of meat and meat products consumed, as well as its diversity between different types of meat were identified in the research. This overview was obtained by calculating individual meals of selected food products.

The average amount of meat and meat products consumed per week was indicated by consumers in portions and subsequently converted to annual consumption in kilograms.

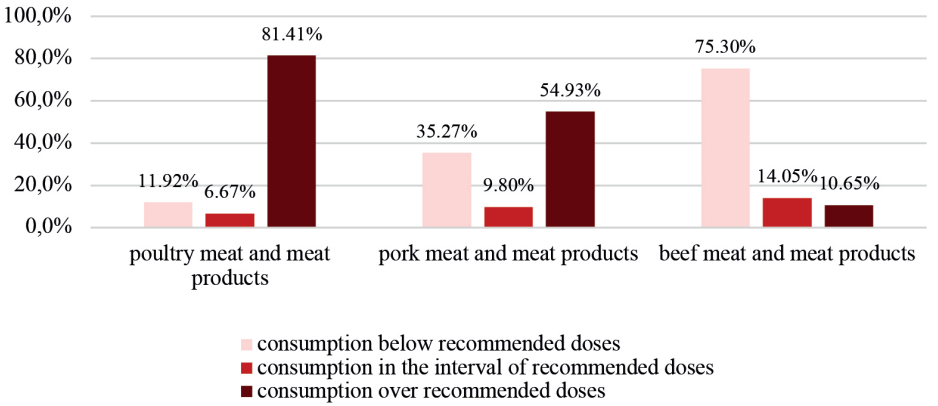
Following the above and based on the results obtained, it can be stated that 81.4% of consumers show excessive consumption of poultry meat and meat products in comparison with the recommended doses resulting from diet rationalization, which represents consumption higher than 16.5 kg per year. On the other hand, it should be emphasized that an adequate amount of poultry meat and meat products according to the recommended doses was consumed by 6.7% of consumers, which corresponds to an annual consumption in the range of 13.5 to 16.5 kg. Insufficient consumption was recorded in 11.9% of consumers, who did not reach the recommended interval of consumption of the studied meat (Figure 1).

Regarding the consumption of pork meat and meat products, the results show that the recommended consumption interval was achieved by 9.8% of consumers participating in the questionnaire survey, which represents an annual consumption of 20 to 24 kg. Excessive consumption of pork meat and meat products was recorded by 54.9% of respondents, which, in combination with an unhealthy lifestyle, lack of exercise and overall malnutrition, can lead to negative health consequences. On the other hand, insufficient consumption according to the recommended doses was recorded by more than 30% of consumers, with their annual consumption being less than 20 kg (Figure 1).

The last type of meat studied was beef, with 75.3% of consumers not reaching the recommended consumption interval, representing an annual consumption of less than 15.5 kg. The positive finding was that 14.0% of respondents reached the recommended interval with annual consumption ranging from 15.5 to 19.0 kg of beef. Excessive consumption of beef and meat products was recorded in 10.6% of consumers (Figure 1).

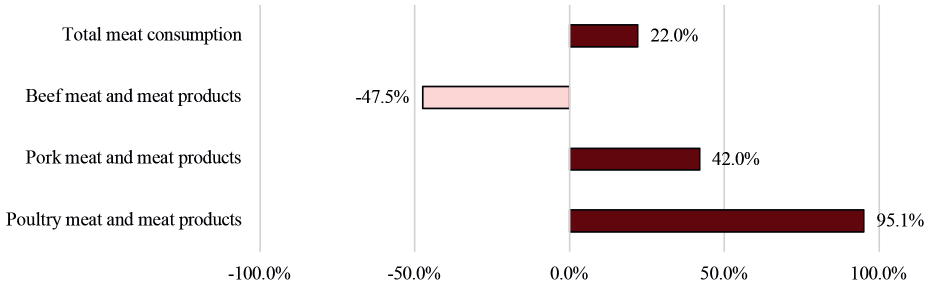
The average annual meat consumption per respondent in the questionnaire survey was found to be 69.9 kg, which means that the recommended dose in terms of diet rationalization was exceeded by approximately 22%.

Figure 1 - Consumption of individual types of meat in terms of recommended doses



Source: Own research.

Figure 2 - Comparison of recommended and real consumption of individual types of meat by consumers involved in consumer research



Source: Own research.

According to the consumption of individual types of meat, it was found that the consumption of poultry and pork was above the recommended doses, with poultry being exceeded by approximately 95% and pork by 42%. On the contrary, the consumption of beef and meat products was insufficient, falling behind the recommended interval by almost 50% (Figure 2). The average weekly consumption of meat and meat products per consumer was estimated at approximately 1.4 kg, with pork accounting for 45.1% of the total consumption, poultry 41.8% and beef 13.1%. The weekly consumption of the average Slovak consumer involved in the survey consisted of 365g of poultry meat, 100g of poultry sausages, 80g of poultry ham, 20g of other poultry products (e.g. canned foods containing poultry), 230g of pork, 100g of pork

sausages, 80g of pork ham, 200g of other pork products (salami, sausage, bacon, stuffing, liver, canned foods containing pork), 140g of beef and 40g of other beef products.

Based on the examined consumption patterns of Slovak consumers, four consumer segments were identified. In these segments, the actual consumption of meat and meat products by different types was compared with the recommended doses resulting from food rationalization. Based on the results, the clusters were characterized as follows: Cluster 1 characterized by the consumption of poultry meat and meat products, Cluster 2 characterized by the consumption of all types of meat and meat products, Cluster 3 characterized by the consumption of pork meat and meat products, and Cluster 4 characterized by the consumption of poultry meat and meat products together with pork meat and meat products. The following Table 3 presents the structure of these clusters and the level of meat consumption by different types of meat.

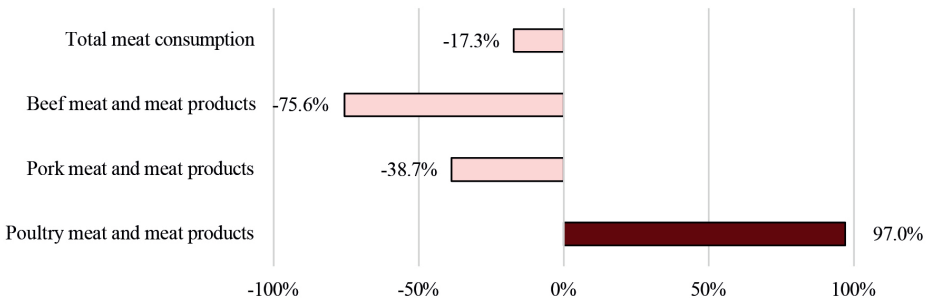
Table 3 - The level of meat and meat products consumption per consumer in individual segments according to individual types of meat

	Cluster 1	**Cluster 2**	**Cluster 3**	**Cluster 4**
	30.20%	21.18%	18.63%	29.99%
Consumption of poultry meat and meat products				
Consumption below recommended doses (lower than 13.4 kg/year)	0.00%	0.00%	64.06%	0.00%
Consumption in interval of recommended doses (13.5-17.5 kg/year)	0.00%	0.00%	35.94%	0.00%
Consumption over recommended doses (more than 17.6 kg/year)	100.00%	100.00%	0.0%	100.00%
Consumption of pork meat and meat products				
Consumption below recommended doses (lower than 19.9 kg/year)	78.55%	13.40%	46.88%	0.00%
Consumption in interval of recommended doses (20- 25 kg/year)	21.45%	6.19%	10.55%	0.00%
Consumption over recommended doses (more than 25.1 kg/year)	0.00%	80.41%	42.57%	100.00%
Consumption of beef meat and meat products				
Consumption below recommended doses (lower than 15.4 kg/year)	100.00%	0.00%	81.25%	100.00%
Consumption in interval of recommended doses (15.5-19.5 kg/year)	0.00%	54.64%	13.28%	0.00%
Consumption over recommended doses (more than 19,6 kg/year)	0.00%	45.36%	5.47%	0.00%

Source: Own research.

The first cluster comprised 30.2% of the total number of respondents involved in the consumer survey. It was found that in this segment, the consumption of poultry meat and meat products was above the recommended doses. On the contrary, the consumption of pork and beef meat and meat products was insufficient compared to the recommended doses resulting from a rational diet. The average annual consumption of meat and meat products per respondent from the segment was 47.4 kg, which represented approximately 17.3% below the recommended dose. Excessive consumption of poultry was recorded at 29.5 kg per year, which corresponded to almost double the recommended doses. Pork meat and products were consumed on average 13.6 kg per year, while consumption was 38.7% below the recommended values. Beef and beef products were consumed in an amount of 4.2 kg per year, which meant that the recommended intake was only 24.1% (Figure 3). The average weekly consumption of respondents from this segment was distributed as follows: 415 g of poultry meat, 70 g of poultry sausages, 80 g of poultry ham, 5 g of other poultry products; 125 g of pork, 30 g of pork sausages, 35 g of pork ham, 70 g of other pork products (salami, bacon, sausage, liver, canned food containing pork); 75 g of beef and 10 g of other beef products.

Figure 3 - Consumption of the average consumer from a segment characterized by the consumption of poultry meat and meat products

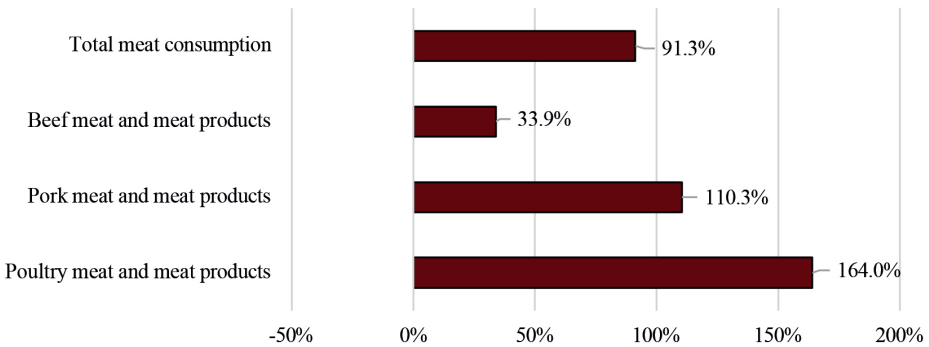


Source: Own research.

The second cluster represented 21.2% of consumers participating in the consumer survey. It was found that this segment included consumers with sufficient consumption of poultry and beef, while the majority (86.6%) also reported adequate consumption of pork meat and meat products. In general, it was found that the second segment included consumers consuming all types of meat. The average annual consumption of meat and meat products per

respondent from the segment was 109.6 kg, which represented an excess of the recommended dose by 91.3%. By individual types of meat, it was found that consumers in this segment consumed 39.6 kg of poultry meat and meat products, 46.7 kg of pork and products, and 23.3 kg of beef and products. For all these types of meat, the excess of the recommended doses was more than 30% (Figure 4). The average weekly consumption of the respondents from this segment was as follows: 405g of poultry meat, 185g of poultry sausages, 120g of poultry ham, 50g of other poultry products; 275g of pork, 175g of pork sausages, 120g of pork ham, 325g of other pork products (salami, bacon, sausage, liver, canned food containing pork); 310g of beef and 135g of other beef products.

Figure 4 - Consumption of the average consumer from a segment characterized by the consumption of all types of meat



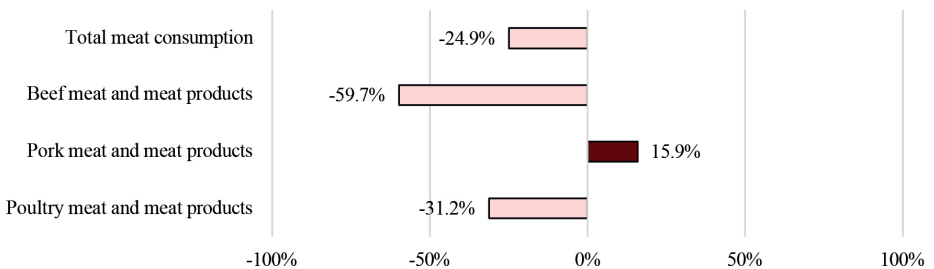
Source: Own research.

The third identified cluster represented 18.6% of all consumers involved in the consumer survey. It was found that this segment included consumers with different levels of consumption of individual types of meat. Excessive consumption of pork meat and meat products was recorded in 53.1% of respondents. On the contrary, the majority of consumers did not consume sufficient amounts of poultry meat or meat products (64.1%) and beef meat or meat products. The average annual consumption of meat and meat products per respondent from the segment was 43.1 kg, which represented approximately 25% below the recommended intake. According to individual types of meat, excessive consumption of pork was identified at the level of 25.1 kg per year, which represented 15.9% higher consumption compared to the recommended intake. Poultry consumption was only 10.3 kg per year, so consumption fell behind the recommended intake by more than 30%. Beef

meat and beef meat products were consumed in an amount of 7 kg per year, which corresponded to only 40.2% of the recommended intake (Figure 5). The average weekly consumption of the respondents from this segment was as follows: 160 g of poultry meat, 17 g of poultry sausages, 20 g of poultry ham, 3 g of other poultry products; 205 g of pork, 80 g of pork sausages, 60 g of pork ham, 145 g of other pork products (salami, bacon, sausage, liver, canned food containing pork); 110 g of beef and 20 g of other beef products.

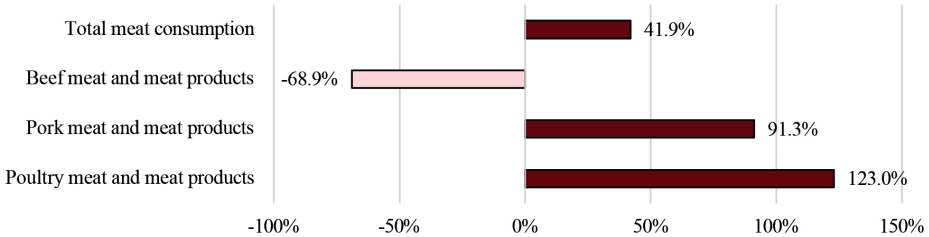
The fourth cluster represented 30.0% of consumers involved in the consumer survey. It was found that this segment included consumers with excessive consumption of poultry and pork meat and meat products. On the other hand, none of the consumers in this segment reached the recommended level of consumption of beef meat and meat products. The consumption pattern found thus corresponded to the behavior of the average Slovak consumer according to the data of the Statistical Office of the Slovak Republic. The average annual consumption of meat and meat products per respondent reached 81.3 kg, which exceeded the recommended dose by more than 40.1%. For poultry meat and meat products, consumption was recorded at 33.4 kg per year, which represented more than double the recommended doses. Similarly, pork also showed excessive consumption, with an average annual consumption of 42.5 kg exceeding the recommended dose by more than 90%. In contrast, the consumption of beef meat and meat products reached only 5.4 kg per year, which represents only about 30% of the recommended intake (Figure 6). The weekly consumption of the average consumer in this segment was 415 g of poultry meat, 110 g of poultry sausages, 100 g of poultry ham, 20 g of canned poultry meat; 320 g of pork, 120 g of pork sausages, 110 g of pork ham, 270 g of other pork products; and approximately 100 g of beef and beef products.

Figure 5 - Consumption of the average consumer from a segment characterized by the consumption of pork meat and meat products



Source: Own research.

Figure 6 - Consumption of the average consumer from a segment characterized by the consumption of poultry meat and meat products and pork meat and meat products



Source: Own research.

Table 4 presents the structure of consumers in clusters according to demographic criteria, along with statistically identified dependencies between segments based on the chi-square test of square contingency. The results showed that in the first, third and fourth segments, women prevailed among consumers of meat and meat products, while in the second segment, characterized by the consumption of all types of meat, men dominated. The differences between these segments were statistically significant ($p < 0.0001$). In terms of age, differences between segments were also confirmed ($p < 0.0001$). In the first segment, which was characterized by higher consumption of poultry meat, young consumers under 25 were most often represented. The level of education showed a moderate effect on the distribution of respondents in the segments ($p = 0.0009$). In the first segment, consumers with higher education were most often represented, while in the second and fourth segments, consumers with secondary education predominated. Results also showed that the place of permanent residence has influenced the consumption of meat ($p = 0.0042$). Urban consumers prevailed in the first, second and third segments, while in the fourth segment, consumers from villages. Slight differences between segments were also noted in the number of household members ($p = 0.0406$). The second segment had more than 20% of consumers living in households with five or more members, while in the other segments this group was represented at a maximum of 16%. An interesting finding was that the third segment consisted of more than 50% of households with one or two members. In terms of economic activity, only slight differences were noted between the segments ($p = 0.0002$). The largest proportion of consumers in the second segment were employees, while in the first segment there was a significant representation of students, which corresponded to the age distribution of this segment. Regarding the income of the households where the respondents

Table 4 - Demographic structure of consumers by clusters

	Cluster 1	Cluster 2	Cluster 3	Cluster 4	p-value
Gender					
Man	25.54%	62.89%	33.98%	47.33%	< 0.0001
Woman	74.46%	37.11%	66.02%	52.67%	
Age					
Up to 25 years	48.67%	35.40%	35.94%	31.55%	< 0.0001
26-34 years	19.04%	25.09%	21.88%	22.57%	
35-50 years	20.72%	20.96%	21.09%	24.76%	
More than 51 years	11.57%	18.55%	21.09%	21.12%	
Achieved education					
Elementary	1.92%	2.75%	5.08%	4.13%	0.0009
Secondary	41.45%	53.26%	45.70%	52.67%	
University	56.63%	43.99%	49.22%	43.20%	
Permanent residence					
City (<20,000 people)	21.44%	25.77%	21.48%	23.79%	0.0042
City (>20,000 people)	36.63%	32.65%	31.25%	24.03%	
Village	41.93%	41.58%	47.27%	52.18%	
Number of household members					
1	6.27%	6.87%	5.86%	4.37%	0.0406
2	19.28%	17.87%	21.88%	20.87%	
3	26.51%	23.37%	32.03%	28.16%	
4	32.77%	29.55%	27.34%	30.58%	
5	12.29%	17.53%	8.20%	9.95%	
More than 5	2.88%	4.81%	4.69%	6.07%	
Economic status					
Employed	43.13%	54.30%	46.48%	53.64%	0.0002
Retired	4.82%	6.87%	10.16%	9.95%	
Self-employed	8.19%	11.00%	7.81%	8.50%	
Student	40.24%	25.77%	30.47%	24.51%	
Maternity leave	2.89%	1.37%	4.30%	2.43%	
Unemployed	0.73%	0.69%	0.78%	0.97%	
Household's income					
Up to 1,000 €	20.00%	16.15%	17.19%	16.99%	< 0.0001
1,001-2,000 €	51.08%	38.83%	53.91%	53.40%	
2,001-3,000 €	19.52%	28.87%	22.65%	24.27%	
3,001-4,000 €	4.10%	8.93%	3.52%	3.64%	
More than 4,001 €	5.30%	7.22%	2.73%	1.70%	

lived, statistically significant differences were identified between the segments ($p < 0.0001$). A similar distribution of income categories was recorded in the first, third and fourth segments, with the majority of consumers living in households with an income of up to €2,000. In contrast, the second segment included more than 40% of consumers from households with a combined income exceeding €2,000.

3.2. *Factors influencing meat consumption in Slovakia*

The research analyzed factors influencing the consumption of meat and meat products, with consumers evaluating 24 selected determinants. Subsequently, hidden relationships between these factors were identified through the application of principal component analysis (PCA). Based on the results, three latent components were extracted that influence purchasing behavior and the subsequent consumption of meat and meat products (Table 5), confirming the assumption about the existence of differences in the evaluation of the factors under study.

The first component included factors related to freshness, quality, aroma, meat content, appearance, country of origin, perishability, previous experiences, price, producer and health aspects. As these factors can be considered essential in consumers' decisions on the purchase and subsequent consumption of meat and meat products, this component was defined as a "key factor" determining the purchase and consumption of meat and meat products. The second component consists of aspects related to the content structure of the products, namely the content of saturated fatty acids, salt, nitrates, water, fat, energy value, protein and emulsifiers. This set of determinants was designated as the "composition factor", since its variables characterize the nutritional and technological properties of meat and meat products. The third component combined factors such as promotion, appearance and size of packaging, speed of preparation and information about the certified organic origin of the product. These aspects reflect the marketing activities of producers and processors aimed at promoting sales, so this component was defined as the "sales and promotion factor", which affects respondents' decision-making process.

The results showed that consumer decisions about the purchase and subsequent consumption of meat and meat products are influenced by broader value orientations. In terms of the importance of the identified latent components, it can be stated that qualitative factors and attributes related to trustworthiness are key for consumers. Composition factors indicate a health-oriented approach to meat and meat products choices and may be significant for a certain segment of consumers, especially for consumers

oriented towards healthy eating. The last group of factors refers to marketing and situational factors, which may play a complementary role in the purchase and consumption process.

Table 5 - Factors affecting meat consumption (PCA)

Factors	Key factor	Composition factor	Sales and promotion factor
Freshness of the product	0.890	0.245	0.128
Quality	0.813	0.301	0.012
Product fragrance	0.785	0.285	0.213
Product appearance	0.773	0.223	0.224
Proportion of meat	0.761	0.427	0.013
Country of origin	0.745	0.341	0.191
Perishability	0.695	0.245	0.371
Previous experience	0.682	0.151	0.337
Manufacturer	0.666	0.350	0.275
Price	0.627	0.067	0.359
Health aspect	0.572	0.454	0.343
Saturated fatty acid content	0.193	0.826	0.266
Salt content	0.240	0.813	0.240
Nitrate content	0.178	0.797	0.183
Water content	0.354	0.764	0.123
Protein content	0.302	0.750	0.155
Fat content	0.290	0.747	0.277
Energy value	0.244	0.733	0.326
Content of emulsifiers	0.404	0.727	0.099
Product promotion	0.141	0.234	0.839
Package size	0.236	0.173	0.825
Appearance of the packaging	0.351	0.158	0.719
Preparation speed	0.171	0.272	0.692
Ecological aspect (organic food)	0.183	0.461	0.589

Source: Own research.

4. Discussion

The paper explores consumer trends in meat consumption, with a particular focus on the determinants shaping consumption patterns of meat and meat products. The consumer study in Slovakia further points out that the most preferred types of meat are poultry meat and meat products as well as pork meat and meat products. These results were confirmed by other studies, and it could be concluded that actual consumer behavior indicates poultry to be the most consumed meat followed by beef (Masuku *et al.*, 2013). Similarly, Babu *et al.* (2010) stated that poultry meat is preferred by most of the rural households when compared to pork and beef and Schmid *et al.* (2017) identified that pork and poultry are the most often consumed types of meat by consumers. Conversely, Kubíčková and Šerhantová (2005) emphasize that beef is bought and consumed less often, while Ndwandwe and Weng (2017) added that the consumer attitude was influenced by a combined effect of several factors including the supply of various types of meat, price of individual types of meat and moreover Christian and cultural orientation of consumers.

Based on the meat consumption, the study identifies four segments depending on the amount of consumption and consumer preference of individual types of meat. A similar consumer study aimed at segmentation was conducted by Kayser *et al.* (2013) and identified three segments depending on the amount of consumption of meat and meat products and their results show that "Low Meat Consumers" consume mainly poultry, the "Average Meat Consumers" and the "Heavy Meat Consumer" prefer pork meat and meat products. In contrast, the consumption of beef and other meat (e.g. lamb, game) did not differ significantly among the three groups and is relatively on the low level, which aptly aligns with these findings.

This study also identified three latent factors that determine the level of meat consumption. Until recently, there have been no consumer studies carried out by using multivariate statistical analysis (factor analysis), but there were several studies aimed at factors determining meat consumption. For instance, Nagyová *et al.* (2012) and Becker *et al.* (2000) confirm that freshness is one of the most important aspects for consumers buying food, especially meat and meat products. Quality has also been identified in several studies as an important factor in the purchase and consumption of meat and meat products and is most often associated with taste, appearance, color, texture, juiciness, or fat marbling (Drey *et al.*, 2017). The importance of the price factor is also confirmed by Kubíčková and Šerhantová (2005), who stated that price has always shaped consumer habits and eating habits. With reference to the price factor, Souček and Turčínková (2015) and Zhang *et al.* (2018) added that the effect of price is significant mainly for people

with a lower purchase price who focus on cheaper types of meat and meat products, while Schmid *et al.* (2017) points out that beef prices are high. The country of origin was also identified by other studies as a decisive factor in the purchase and consumption of meat and meat products (Bernué *et al.*, 2003; Náglová, & Špička, 2017). Revoredo-Giha *et al.* (2011) pointed out that consumers perceive Scottish beef as a differentiated product independent of price, placing a strong emphasis on the origin and quality of the meat. According to Flaudrops *et al.* (2015) it is important to determine the origin of meat, in connection with the safety of consumption and the existing scandals in the agrifood industry as well. Garmyn (2020) also emphasize that at the point of purchase, consumers often notice color, marbling, leanness, packaging, and price of meat and then these aspects are determining for meat purchase and consumption. On the other hand, the less important factor affecting purchase and consumption of meat and meat products are the aspect of organic food, factors related to product packaging and marketing sales support (Kubíčková, & Šerhantová, 2005). As a corollary, Perea (2023) further emphasizes that understanding variables such as cultural and religious values, health and environmental concerns is essential for a proper understanding of consumer behavior and preferences in meat consumption.

Conclusions

In conclusion, this paper provides valuable insights into the meat and meat product consumption trends in the Slovak Republic and consumption patterns of Slovak meat consumers with an emphasis on the amount of consumed meat and factors affecting meat consumption. The study identified four consumer segments created based on the consumed amount and preference for individual types of meat. Moreover, this consumer study revealed key factors determining meat consumption in Slovakia. It is important to note that these current patterns of meat and meat product consumption in the studied sample do not correspond to the recommended consumption level set by the Public Health Authority of the Slovak Republic.

Following the mentioned findings, the study has its theoretical implications. The identification of four consumer segments, as well as key factors for meat consumption offers a theoretical foundation for future studies on consumer behavior in the meat market. Moreover, from a scientific perspective, the study contributes to understanding the preferences and behavior of consumers for meat consumption, with a focus on different types of meat. From a practical perspective, this research emphasizes the necessity of solving imbalances in meat consumption. For one, study findings are beneficial for companies in the meat industry. Particularly, insights

into segment behavior and the identification of latent factors influencing consumption can be used in creating marketing strategies and developing new meat products regarding aspects of health and sustainability. The study and its results can also be valuable for policymakers. By implementing educational and information campaigns reflecting meat consumption patterns of identified consumer clusters, it is possible to increase consumer awareness of the recommended levels of consumption of individual types of meat, as well as the environmental impacts of meat production and consumption. The suggestions would not concern the complete exclusion of meat from consumers' diets, but a shift towards responsible and adequate consumption that considers health and environmental challenges.

However, it is necessary to point out the limitations of this study. The key limitation is the reliance on self-reported data obtained from a consumer survey. Moreover, the study's territorial scope, sampling strategy and lack of key demographic controls such as religion may limit the generalizability of the findings to other regions or populations.

Future research should expand territorial coverage and use probability or quota sampling to improve representativeness and generalizability of obtained results. In addition, the research should address religion and other cultural-demographic controls to test confounding and refine segmentation across subpopulations.

Acknowledgements

This publication was supported by project VEGA no. 1/0310/24 titled as "Research of Innovative Forms of Marketing for Regional Food Brands" and by the Operational Program Integrated Infrastructure within the project: Demand-driven research for the sustainable and innovative food, Drive4SIFood 313011V336, co-financed by the European Regional Development Fund.

References

Almeida, A., Torres, J., & Rodrigues, I. (2023). The impact of meat consumption on human health, the environment and Animal Welfare: Perceptions and knowledge of pre-service teachers. *Societies*, *13*(6), 143. Doi: 10.3390/soc13060143.

Andreani, G., Sogari, G., Marti, A., Froldi, F., Dagevos, H., & Martini, D. (2023). Plant-based meat alternatives: Technological, nutritional, environmental, market, and social challenges and opportunities. *Nutrients*, *15*(2), 452. Doi: 10.3390/nu15020452.

Antošová, I., & Stávková, J. (2023). Changes in the intensity and impact of factors influencing consumer behaviour in the food market over time. *Agricultural Economics (Zemědělská_Ekonomika)*, *69*(9), 358-365. Doi: 10.17221/191/2023-agricecon.

Babu, A. J., Sundari, A. R., Triveni, G., & Indumathi, J. (2010). Study on meat consumption patterns in rural house holds of chittoor district of Andhra Pradesh. *Tamilnadu Journal of Veterinary and Animal Sciences*, *6*(4), 183-187.

Becker, T., Benner, E., & Glitsch, K. (2000). Consumer perception of fresh meat quality in Germany. *British Food Journal*, *102*(3), 246-266. Doi: 10.1108/00070700010324763.

Bernués, A., Olaizola, A., & Corcoran, K. (2003). Labelling information demanded by European consumers and relationships with purchasing motives, quality and safety of meat. *Meat Science*, *65*(3), 1095-1106. Doi: 10.1016/s0309-1740(02)00327-3.

Chaib, R. L., Macombe, C., & Thomopoulos, R. (2023). Adapting a participatory modelling method to forecast food system scenarios: A case study on the pork value-chain. *Economia Agro-Alimentare*, *24*(3), 1-37. Doi: 10.3280/ecag2022oa14488.

Clare, K., Maani, N., & Milner, J. (2022). Meat, money and messaging: How the environmental and health harms of red and processed meat consumption are framed by the Meat Industry. *Food Policy*, *109*, 102234. Doi: 10.1016/j.foodpol.2022.102234.

Collier, E. S., Oberrauter, L.-M., Normann, A., Norman, C., Svensson, M., Niimi, J., & Bergman, P. (2021). Identifying barriers to decreasing meat consumption and increasing acceptance of meat substitutes among Swedish consumers. *Appetite*, *167*, 105643. Doi: 10.1016/j.appet.2021.105643.

Crippa, M., Solazzo, E., Guizzardi, D., Monforti-Ferrario, F., Tubiello, F. N., & Leip, A. (2021). Food Systems are responsible for a third of global anthropogenic GHG emissions. *Nature Food*, *2*(3), 198-209. Doi: 10.1038/s43016-021-00225-9.

Croney, C., & Swanson, J. (2023). Is meat eating morally defensible? contemporary ethical considerations. *Animal Frontiers*, *13*(2), 61-67. Doi: 10.1093/af/vfac097.

Dobersek, U., Wy, G., Adkins, J., Altmeyer, S., Krout, K., Lavie, C. J., & Archer, E. (2020). Meat and Mental Health: A systematic review of meat abstention and depression, anxiety, and related phenomena. *Critical Reviews in Food Science and Nutrition*, *61*(4), 622-635. Doi: 10.1080/10408398.2020.1741505.

Drey, L. N., Legako, J. F., Brooks, J. C., Miller, M. F., & O'quinn, T. G. (2017). The contribution of tenderness, juiciness, and flavor to overall consumer beef eating experience. *Meat and Muscle Biology*, *1*(3), 13-13. Doi: 10.22175/rmc2017.012.

Fernández-Giménez, M. E., Ravera, F., & Oteros-Rozas, E. (2022). The invisible thread: Women as tradition keepers and change agents in Spanish pastoral social-ecological systems. *Ecology and Society*, *27*(2). Doi: 10.5751/es-12794-270204.

Flaudrops, C., Armstrong, N., Raoult, D., & Chabrière, E. (2015). Determination of the animal origin of meat and gelatin by MALDI-TOF-MS. *Journal of Food Composition and Analysis*, *41*, 104-112. Doi: 10.1016/j.jfca.2015.02.009.

Font-i-Furnols, M. (2023). Meat Consumption, sustainability and alternatives: An overview of motives and barriers. *Foods*, *12*(11), 2144. Doi: 10.3390/foods12112144.

Font-i-Furnols, M., & Guerrero, L. (2022). Understanding the future meat consumers. *Meat Science*, *193*, 108941. Doi: 10.1016/j.meatsci.2022.108941.

Font-i-Furnols, M., & Guerrero, L. (2014). Consumer preference, behavior and perception about meat and meat products: An overview. *Meat Science*, *98*(3), 361-371. Doi: 10.1016/j.meatsci.2014.06.025.

Garcez de Oliveira Padilha, L., Malek, L., & Umberger, W. J. (2021). Sustainable meat: Looking through the eyes of Australian consumers. *Sustainability*, *13*(10), 5398. Doi: 10.3390/su13105398.

Garmyn, A. (2020). Consumer preferences and acceptance of meat products. *Foods*, *9*(6), 708. Doi: 10.3390/foods9060708.

Gebska, M., Golebiewska, B., & Hubbard, C. (2020). Polish farmer and consumer preference for product produced within standards respected animal welfare. *Economia agro-alimentare*, *20*(3), 733-752. Doi: 10.3280/ecag2019-003009.

Geiker, N. R., Bertram, H. C., Mejborn, H., Dragsted, L. O., Kristensen, L., Carrascal, J. R., Bügel, S., & Astrup, A. (2021). Meat and human health –current knowledge and research gaps. *Foods*, *10*(7), 1556. Doi: 10.3390/foods10071556.

Hayek, M. N., Harwatt, H., Ripple, W. J., & Mueller, N. D. (2021). The carbon opportunity cost of animal-sourced food production on land. *Nature Sustainability*, *4*(1), 21-24. Doi: 10.1038/s41893-020-00603-4.

Henry, R. C., Alexander, P., Rabin, S., Anthoni, P., Rounsevell, M. D. A., & Arneth, A. (2019). The role of Global Dietary Transitions for safeguarding biodiversity. *Global Environmental Change*, *58*, 101956. Doi: 10.1016/j.gloenvcha.2019.101956.

Ivanova, D., Barrett, J., Wiedenhofer, D., Macura, B., Callaghan, M., & Creutzig, F. (2020). Quantifying the potential for climate change mitigation of consumption options. *Environmental Research Letters*, *15*(9), 093001. Doi: 10.1088/1748-9326/ab8589.

Kayser, M., Nitzko, S., & Spiller, A. (2013). Analysis of differences in meat consumption patterns. *International Food and Agribusiness Management Review*, *16*(2), 43-56.

Kemper, J. A. (2020). Motivations, barriers, and strategies for meat reduction at different family lifecycle stages. *Appetite*, *150*, 104644. Doi: 10.1016/j.appet.2020.104644.

Kubíčková, L., & Šerhantová, V. (2005). Analysis of changes in meat and meat products consumption in the Czech Republic in the past ten years. *Agricultural Economics (Zemědělská Ekonomika)*, *51*(9), 395-401. Doi: 10.17221/5126-agricecon.

Leroy, F., Smith, N. W., Adesogan, A. T., Beal, T., Iannotti, L., Moughan, P. J., & Mann, N. (2023). The role of meat in the human diet: Evolutionary aspects and nutritional value. *Animal Frontiers*, *13*(2), 11-18. Doi: 10.1093/af/vfac093.

Lescinsky, H., Afshin, A., Ashbaugh, C., Bisignano, C., Brauer, M., Ferrara, G., Hay, S. I., He, J., Iannucci, V., Marczak, L. B., McLaughlin, S. A., Mullany, E. C., Parent, M. C., Serfes, A. L., Sorensen, R. J., Aravkin, A. Y., Zheng, P., & Murray, C. J. (2022). Health effects associated with consumption of unprocessed red meat: A burden of proof study. *Nature Medicine*, *28*(10), 2075-2082. Doi: 10.1038/s41591-022-01968-z.

Libera, J., Iłowiecka, K., & Stasiak, D. (2021). Consumption of processed red meat and its impact on Human Health: A Review. *International Journal of Food Science & Technology*, *56*(12), 6115-6123. Doi: 10.1111/ijfs.15270.

Lourenco, C. E., Nunes-Galbes, N. M., Borgheresi, R., Cezarino, L. O., Martins, F. P., & Liboni, L. B. (2022). Psychological barriers to sustainable dietary patterns: Findings from Meat Intake behaviour. *Sustainability*, *14*(4), 2199. Doi: 10.3390/su14042199.

Mackenzie, M., Weber, K., Fountain, J., & Abbasi, R. (2024). Segmenting Chinese wine consumers on the basis of wine knowledge and consumption behavior. *International Journal of Wine Business Research*, *37*(2), 233-255. Doi: 10.1108/ijwbr-06-2023-0035.

Marinova, D., & Bogueva, D. (2019). Planetary health and reduction in meat consumption. *Sustainable Earth*, *2*(1). Doi: 10.1186/s42055-019-0010-0.

Markoni, E., Ha, T. M., Götze, F., Häberli, I., Ngo, M. H., Huwiler, R. M., Delley, M., Nguyen, A. D., Bui, T. L., Le, N. T., Pham, B. D., & Brunner, T. A. (2023). Healthy or environmentally friendly? meat consumption practices of green consumers in Vietnam and Switzerland. *Sustainability*, *15*(15), 11488. Doi: 10.3390/su151511488.

Marzban, A., Emami, P., & Moslehi, S. (2023). Meat-eating: The second main culprit of climate change. *Health in Emergencies & Disasters Quarterly*, *8*(3), 145-148. Doi: 10.32598/hdq.8.3.468.2.

Masuku, B. (2013). Socioeconomic analysis of beekeeping in Swaziland: A case study of the Manzini Region, Swaziland. *Journal of Development and Agricultural Economics*, *5*(6), 236-241. Doi: 10.5897/jdae2013.002.

Náglová, Z., & Špička, J. (2017). Spotřebitelské preference kvality a ceny při nákupu masa a masných výrobků. *Maso*, *28*(1), 20-25.

Nagyová, Ľ., Horská, E., Paluchová, J., Neomániová, K., Kádeková, Z., & Récky, R. (2012). *Trendy v spotrebiteľskom správaní na trhu potravín v SR*. Slovenská poľnohospodárska univerzita.

Ndwandwe, S. B., & Weng, R. C. (2017). Pork consumer preferences in Swaziland. *International Journal of Development and Sustainability*, *6*(8), 545-560.

Nungesser, F., & Winter, M. (2021). Meat and social change: Sociological perspectives on the consumption and production of animals. *OZS, Osterreichische Zeitschrift fur Soziologie*, *46*(2), 109-124. Doi: 10.1007/s11614-021-00453-0.

Oliveira Linder, M., Sidali, K. L., & Busch, G. (2021). Mountain Beef and wine: Italian consumers' definitions and opinions on the mountain labelling-scheme. *Economia Agro- Alimentare*, *21*(1), 1-39. Doi: 10.3280/ecag1-2021oa11549.

Parlasca, M. C., & Qaim, M. (2022). Meat consumption and sustainability. *Annual Review of Resource Economics*, *14*(1), 17-41. Doi: 10.1146/annurev-resource-111820-032340.

Perea, P. D. (2023). From Affluence to Processed Food: Meat Consumption in Spain from 1950 to the present. *Historia agraria: Revista de agricultura e historia rural*, (91), 223-253. Doi: 10.26882/histagrar.091e04d.

Popescu, A. (2013). Research on consumer behaviour on Bucharest meat market. *Scientific Papers Series: Management, Economic Engineering in Agriculture and Rural Development*, *13*(1), 301-308.

Pourová, M., & Stehlík, V. (2002). Czech consumers' evaluation of Choosen Meat Products. *Agricultural Economics (Zemědělská Ekonomika)*, *48*(3), 121-125. Doi: 10.17221/5459-agricecon.

Predanocyová, K., Kubicová, Ľ., Kádeková, Z., & Košičiarová, I. (2019). Key factors affecting consumption of meat and meat products from perspective of Slovak consumers. *Potravinarstvo Slovak Journal of Food Sciences*, *13*(1), 1001-1012. Doi: 10.5219/1198.

Revoredo-Giha, C., Lamprinopoulou, C., Leat, P., Kupiec-Teahan, B., Toma, L., & Cacciolatti, L. (2011). How differentiated is Scottish beef? an analysis of supermarket data. *Journal of Food Products Marketing*, *17*(2-3), 183-210. Doi: 10.1080/10454446.2011.548742.

Selinske, M. J., Garrard, G. E., Gregg, E. A., Kusmanoff, A. M., Kidd, L. R., Cullen, M. T., Cooper, M., Geary, W. L., Hatty, M. A., Hames, F., Kneebone, S., McLeod, E. M., Ritchie, E. G., Squires, Z. E., Thomas, J., Willcock, M. A., Blair, S., & Bekessy, S. A. (2020). Identifying and prioritizing human behaviors that benefit biodiversity. *Conservation Science and Practice*, *2*(9). Doi: 10.1111/csp2.249.

Schmid, A., Gille, D., Piccinali, P., Bütikofer, U., Chollet, M., Altintzoglou, T., Honkanen, P., Walther, B., & Stoffers, H. (2017). Factors predicting meat and meat products consumption among middle-aged and elderly people: Evidence from a consumer survey in Switzerland. *Food & Nutrition Research*, *61*(1), 1308111. Doi: 10.1080/16546628.2017.1308111.

Singh, D. N., Bohra, J. S., Dubey, T. P., Shivahre, P. R., Singh, R. K., Singh, T., & Jaiswal, D. K. (2023). Common foods for boosting human immunity: A Review. *Food Science & Nutrition*, *11*(11), 6761-6774. Doi: 10.1002/fsn3.3628.

Souček, M., & Turčínková, J. (2015). Factors for choosing a point of purchase of meat products. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, *63*(2), 639-646. Doi: 10.11118/actaun201563020639.

Springmann, M., Godfray, H. C., Rayner, M., & Scarborough, P. (2016). Analysis and valuation of the health and climate change cobenefits of dietary change. *Proceedings of the National Academy of Sciences*, *113*(15), 4146-4151. Doi: 10.1073/pnas.1523119113.

Stadnik, J. (2024). Nutritional value of meat and meat products and their role in human health. *Nutrients*, *16*(10), 1446. Doi: 10.3390/nu16101446.

Stávková, J., Stejskal, L., & Toufarová, Z. (2008). Factors influencing consumer behaviour. *Agricultural Economics (Zemědělská Ekonomika)*, *54*(6), 276-284. Doi: 10.17221/283-agricecon.

Stewart, C., Piernas, C., Cook, B., & Jebb, S. A. (2021). Trends in UK meat consumption: Analysis of data from Years 1-11 (2008-09 to 2018-19) of the National Diet and Nutrition Survey Rolling Programme. *The Lancet Planetary Health*, *5*(10). Doi: 10.1016/s2542-5196(21)00228-x.

Sun, Z., Scherer, L., Tukker, A., Spawn-Lee, S. A., Bruckner, M., Gibbs, H. K., & Behrens, P. (2022). Dietary change in high-income nations alone can lead to substantial double climate dividend. *Nature Food*, *3*(1), 29-37. Doi: 10.1038/s43016-021-00431-5.

Szczebyło, A., Halicka, E., Rejman, K., & Kaczorowska, J. (2022). Is eating less meat possible? exploring the willingness to reduce meat consumption among millennials morkin in Polish cities. *Foods*, *11*(3), 358. Doi: 10.3390/foods11030358.

Šedík, P., Pocol, C. B., Horská, E., & Fiore, M. (2019). Honey: Food or Medicine? A comparative study between Slovakia and Romania. *British Food Journal*, *121*(6), 1281-1297. Doi: 10.1108/bfj-12-2018-0813.

Thompson, L., Rowntree, J., Windisch, W., Waters, S. M., Shalloo, L., & Manzano, P. (2023). Ecosystem management using livestock: Embracing diversity and respecting ecological principles. *Animal Frontiers*, *13*(2), 28-34. Doi: 10.1093/af/vfac094.

Troiano, C., Buglione, M., Petrelli, S., Belardinelli, S., De Natale, A., Svenning, J.-C., & Fulgione, D. (2021). Traditional free-ranging livestock farming as a management strategy for biological and cultural landscape diversity: A case from the southern apennines. *Land*, *10*(9), 957. Doi: 10.3390/land10090957.

Turnes, A., Pereira, P., Cid, H., & Valente, A. (2023). Meat consumption and availability for its reduction by Health and Environmental Concerns: A pilot study. *Nutrients*, *15*(14), 3080. Doi: 10.3390/nu15143080.

Udomkun, P., Ilukor, J., Mockshell, J., Mujawamariya, G., Okafor, C., Bullock, R., Nabahungu, N. L., & Vanlauwe, B. (2018). What are the key factors influencing consumers' preference and willingness to pay for meat products in Easterndrc? *Food Science & Nutrition*, *6*(8), 2321-2336. Doi: 10.1002/fsn3.813.

Valli, C., Maraj, M., Prokop-Dorner, A., Kaloteraki, C., Steiner, C., Rabassa, M., Solà, I., Zajac, J., Johnston, B. C., Guyatt, G. H., Bala, M. M., & Alonso-Coello, P. (2022). People's values and preferences about meat consumption in view of the potential environmental impacts of meat: A mixed-methods systematic review. *International Journal of Environmental Research and Public Health*, *20*(1), 286. Doi: 10.3390/ijerph20010286.

Van der Weele, C., Feindt, P., Jan van der Goot, A., van Mierlo, B., & van Boekel, M. (2019). Meat alternatives: An integrative comparison. *Trends in Food Science & Technology*, *88*, 505-512. Doi: 10.1016/j.tifs.2019.04.018.

Veiga, C. P., Moreira, M. N., Veiga, C. R., Souza, A., & Su, Z. (2023). Consumer behavior concerning meat consumption: Evidence from Brazil. *Foods*, *12*(1), 188. 10.3390/foods12010188.

Willett, W., Rockström, J., Loken, B., Springmann, M., Lang, T., Vermeulen, S., & Murray, C. J. (2019). Food in the Anthropocene: the EAT-Lancet Commission on healthy dietsfrom sustainable food systems. *The lancet*, *393*(10170), 447-492. Doi: 10.1016/S0140-6736(18)31788-4.

Williams, D. R., Clark, M., Buchanan, G. M., Ficetola, G. F., Rondinini, C., & Tilman, D. (2020). Proactive conservation to prevent habitat losses to agricultural expansion. *Nature Sustainability*, *4*(4), 314-322. Doi: 10.1038/s41893-020-00656-5.

Wood, J. D. (2023). Meat composition and nutritional value. *Lawrie's Meat Science*, 665-685. Doi: 10.1016/b978-0-323-85408-5.00012-1.

Yang, X. (2021). Potential consequences of covid-19 for sustainable meat consumption: The role of food safety concerns and responsibility attributions. *British Food Journal*, *123*(2), 455-474. Doi: 10.1108/bfj-04-2020-0332.

Zhang, H., Wang, J., & Martin, W. (2018). Factors affecting households' meat purchase and future meat consumption changes in China: A demand system approach. *Journal of Ethnic Foods*, *5*(1), 24-32. Doi: 10.1016/j.jef.2017.12.004.