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Article

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SPORT, CULTURE, AND PURCHASING POWER: INFLUENCES ON FOOD MARKETS AND CONSUMPTION

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Abstract

This study aimed to investigate the influence of economic, cultural, and lifestyle factors on food consumption patterns in 31 European and associated countries between 2010 and 2020. A panel econometric model with random effects was used to analyse data from international sources, including GDP adjusted for purchasing power parity, cultural indices, and food consumption statistics. The findings revealed that increased sports participation and purchasing power significantly increased vegetable, fruit, and fish consumption, while cultural values such as individualism and long-term orientation shaped dietary preferences. Unlike previous research that focused on individual-level factors, this study integrated macroeconomic determinants to provide a comprehensive analysis of national food consumption trends. Furthermore, critical shifts in the food market were identified, including the increasing demand for healthy and sustainable products, highlighting the challenges faced by food chain actors in adapting to these changes. The results provide a valuable framework for policy makers and business strategies, highlighting the need for resilience, innovation, and market adaptation to align with evolving consumer preferences.

Keywords: food consumption structure, sports participation, purchasing power, cultural values, driving market shifts.

JEL Classification: Q18, C23, Z20.

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Introduction

Studying changes in the food market by examining consumer demand for food products and its economic and behavioural drivers is important to understand how the food industry is changing. Consumer preferences are evolving, with more people choosing healthier, sustainable, and locally sourced foods, which directly impacts the products offered on the market. Technological innovations are also reshaping the food industry, enabling new efficient ways to produce, process, and distribute food, while creating opportunities for different business models throughout the supply chain. Sustainability is a key concern as the food industry is under pressure to reduce environmental impacts while meeting consumer expectations and remaining profitable. Businesses must also develop resilience and adapt to these market changes to remain competitive. Effective marketing and communication play an important role in connecting food producers, processors, and retailers with current consumer trends. By aligning all parts of the food chain with these trends, companies can better respond to market demands and improve their long-term success.

The structure of food consumption (how much people eat vegetables, fruits, fish or meat) is heavily influenced by health awareness and sports activity. People who are health conscious often prioritise diets high in fruits, vegetables, and fish due to the known health benefits of these foods, such as vitamins, antioxidants, and lean proteins. Regular sports participation further shapes these choices, as active people tend to choose leaner, protein-rich options that support physical performance, such as poultry and fish, over red meat. In many European countries, the growing popularity of sports and fitness has led to an increased demand for 'health foods', including organic produce and high-protein items, creating a trend towards balanced and nutritious diets. Additionally, purchasing power allows health conscious consumers to purchase premium food items such as fresh fish or organic vegetables, which are often more costly. This trend is strong in Northern Europe, where health and fitness are culturally emphasised, leading to diets rich in fish and plant-based foods. In southern Europe, although traditional diets are high in vegetables and fish, there is also growing awareness of healthy eating and fitness. Cultural values that promote well-being and active lifestyles can strongly impact dietary choices, as seen in countries such as Sweden and Denmark. In general, sports and health concerns are key drivers of food consumption patterns throughout Europe, contributing to a shift toward balanced diets that align with active and health-focused lifestyles.

The academic literature extensively explores food consumption patterns, but most studies focus on individual-level factors, such as why a person chooses one type of food over another. However, understanding the structure of food consumption at the national level is equally important, as it reveals broader trends that shape market demands. Our study addresses this gap by examining how national determinants, such as economic factors, cultural values, health trends, and participation in sports, collectively influence food consumption patterns. The *originality of our research* lies in its comprehensive macro-level perspective, which integrates these diverse determinants into a unified analytical framework. Unlike existing studies, our approach highlights how societal preferences and behaviours drive changes in food markets, providing essential insights for policymakers, companies, and public health advocates. By focussing on European countries, we emphasise the geographical and cultural diversity of food preferences across the continent. For example, physically active and health conscious populations are driving the increased demand for lean proteins and fresh produce, prompting producers and retailers to adapt accordingly. This has significant implications for

food market shifts, as businesses in the food chain must respond to regional trends in consumer demand to remain competitive. The findings can guide companies in tailoring their offerings to meet changing dietary patterns, leading to more effective strategies and product development. Our study provides insights into how evolving consumer needs impact the food market, helping stakeholders better anticipate and respond to changes in market dynamics throughout Europe.

The article begins with a *review of the literature* that examines academic research on factors likely to influence the structure of food consumption. The next section, *Research Methodology*, details the data sources from EU and associated countries, defines the variables used in the empirical study, and describes the statistical approach. This methodology includes panel econometrics, relevant tests, as well as the role of descriptive statistics and graphical visualisations. In the *Results and Discussion* section, the article highlights trends emerging from descriptive statistics and presents the findings from econometric estimations, followed by an analysis of these results. The article closes with the *Conclusions* section, which includes a summary of findings, study limitations, directions for future research, and policy implications.

1. Review of the literature

The academic literature on food consumption is extensive. However, it focusses mainly on individual behaviour. Our approach is different, targeting the macro-level. We examine national determinants of food consumption. The literature review is divided into four parts. First, we analyse how sports participation influences the consumption structure. Second, we explore the impact of purchasing power on consumption preferences. Third, we investigate the link between cultural values and specific product groups. Finally, we assess how product demand affects the functioning of specific markets.

Sports and Food Consumption Preferences. Sports participation significantly influences dietary choices, as people engaged in physical activity tend to prioritise nutrient-dense foods for performance and recovery. Meyer and Reguant-Closa (2017) emphasise the role of protein-rich diets, particularly meat and dairy, and incorporate sustainability as a growing concern in sports nutrition. This aligns with Dagevos and Van Ophem (2013), who introduce the concept of Food Consumption Value (FCV), explaining that food choices in sports reflect broader values such as health and well-being. However, Çebi et al. (2020) take a different approach, focussing on meal timing and frequency, especially breakfast habits, as critical factors in maintaining diet quality among students from sports faculty. While both perspectives acknowledge structured eating habits, Meyer and Reguant-Closa (2017) integrate ethical concerns, whereas Çebi et al. (2020) emphasise the physiological benefits of planned eating patterns. Beyond structured meals, Cui et al. (2022) highlight the rapid expansion of the sports food industry, driven by the growing demand for energy-dense bars, protein supplements, and specialised sports products. This commercialisation of sports nutrition contrasts with Fieldhouse (2013), who examines the cultural and social norms that shape food choices in active individuals, demonstrating how societal expectations influence dietary behaviour. Although Cui et al. (2022) analyse market-driven shifts, Fieldhouse (2013) focusses on how cultural narratives surrounding nutrition affect athletes' preferences. Furthermore, sports participation often correlates with a greater focus on healthy foods such as fruits and vegetables, aligning with the broader goal of optimising performance. This trend

is supported by Dagevos and Van Ophem (2013), who suggest that FCV helps explain why athletes and active people may prioritise food choices based on long-term health benefits. However, this contrasts with Çebi et al. (2020), who argue that structured eating routines and meal frequency are more immediate determinants of dietary quality than ethical or health-conscious motivations. Together, these studies demonstrate how sports-related food choices are shaped by commercial influences (Cui et al., 2022), structured dietary habits (Çebi et al., 2020), cultural expectations (Fieldhouse, 2013), and personal values (Dagevos and Van Ophem, 2013). Although some emphasise the impact of the market and industry on sports nutrition, others highlight the role of meal structure, cultural norms, or ethical considerations in shaping dietary behaviour. This interplay of factors underscores the complexity of food preferences in sports and fitness contexts.

Purchasing Power and Food Preferences. Purchasing power is a critical determinant of food preferences, influencing consumers' access to a variety of foods. Higher incomes generally allow consumers to afford more nutritious and diverse foods, such as fruits, vegetables, and lean proteins (European Commission, 2024). Fallo, Nuhriwangsa and Hanim (2019) examine how purchasing power affects the consumption of fruits and vegetables among elementary students, finding a significant correlation between income and diet quality. Ayaviri-Nina et al. (2022) study rural families in Ecuador, showing that higher family income is related to greater food security, whereas low purchasing power limits dietary diversity. Similarly, Bandara et al. (2021) explore changes in food consumption patterns in Sri Lanka, highlighting how income growth and urbanisation drive the demand for diverse food products beyond traditional staples. Blisard et al. (2002) provides further evidence by projecting US food spending growth based on income trends, suggesting that increased purchasing power will expand demand for diverse food options. Zhang, Grunert and Zhou (2020) also discuss consumer interest in local foods, noting that purchasing power enables the support of locavorism in developed markets. As purchasing power increases globally, it redefines consumer demand for high quality, premium, and locally sourced food products, prompting changes in the food market to meet these preferences.

Cultural Values and Food Preferences. Cultural values are fundamental determinants of food choices, shaping dietary habits through long-standing social norms and traditions. Djekic et al. (2021) explore the relationship between Hofstede's cultural dimensions and food choice, showing that individualistic and uncertainty-averse cultures tend to favour health-conscious diets. This aligns with Nemeth et al. (2019), who examine international students in Hungary and find that cultural backgrounds significantly influence dietary preferences, often reinforcing the tendency to maintain traditional eating patterns even when living abroad. Similarly, De Mooij and Hofstede (2011) demonstrate that cultural norms impact consumer behaviour, influencing both food selection and broader consumption habits in different societies. At a global level, Kearney (2010) highlights how cultural factors shape the nutrition transition in developing countries, with dietary changes occurring at different rates depending on societal norms and exposure to globalisation. This cultural influence extends to the ethical and emotional dimensions of food consumption, as described by Dagevos and Van Ophem (2013), who introduce the concept of Food Consumption Value (FCV). They argue that cultural values shape food choices by integrating health, sustainability, and personal beliefs into purchasing decisions, which contrasts with purely economic drivers. In this context, Feldmann and Hamm (2015) offer a complementary perspective by analysing how cultural values and local food preferences interact. Their study reveals that while local food is often associated with freshness and quality, consumer demand varies significantly based on

cultural attitudes toward food origin, authenticity, and sustainability. This connects with Sun, Horn and Merritt (2009), who identify cultural dimensions such as masculinity and self-consciousness as factors that encourage healthier eating habits, demonstrating how identity influences food choices. Taken together, these studies illustrate that cultural values influence food preferences through a combination of tradition, identity, and ethical considerations. Although Feldmann and Hamm (2015) emphasise the cultural motivations behind local food consumption, Djekic et al. (2021) and Nemeth et al. (2019) focus on how cultural dimensions and migration affect food choices. This collective evidence underscores the profound role of cultural norms in the shaping of national and regional food markets, demonstrating how both individual preferences and societal expectations contribute to dietary behaviour.

Consumer preferences and market trends. Consumer preferences are evolving, with a growing focus on health, sustainability, and local food supply, all of which are key drivers of market trends. Kearney (2010) highlights a global shift toward more diversified diets, driven by urbanisation and rising incomes, which broadens consumer demand for varied and nutritious food options. This aligns with Hartman-Petrycka et al. (2024), who find that younger consumers increasingly prioritise balanced diets rich in vegetables and fish due to health and environmental concerns. Similarly, Larson (2004) explores market segmentation based on food consumption patterns, helping businesses tailor products to align with regional dietary preferences. Beyond these economic and demographic influences, Dagevos and Van Ophem (2013) introduce the concept of Food Consumption Value (FCV), arguing that emotional and ethical considerations play a significant role in shaping food choices. This perspective aligns with Meyer and Reguant-Closa (2017), who examine sustainability in sports nutrition, highlighting that athletes increasingly opt for foods that align with environmental concerns. Zhang, Grunert and Zhou (2020) further explore the growing preference for local food, particularly in environmentally conscious markets like Denmark, where “locavorism” reflects both ethical and health-driven motivations. In this context, Rana and Paul (2017) provide a broader framework to understand consumer behaviour, particularly in the organic food market. Their study highlights how health awareness, environmental awareness, and trust in certification systems contribute to shifting food preferences, particularly as consumers seek products perceived as safer and more sustainable. This is particularly relevant to Ho et al. (2022), who examine how cultural backgrounds influence attention to food labels, shaping consumer perceptions of product authenticity and quality. Together, these studies illustrate how consumer preferences are shaped by a combination of economic, ethical, and health-related factors. Although Kearney (2010) and Hartman-Petrycka et al. (2024) focus on the role of income and generational trends, Rana and Paul (2017) provide insight into the psychological and environmental motivations behind food choices. These evolving preferences continue to shape food markets, requiring producers and retailers to adapt to the growing demand for healthier, sustainable, and ethically sourced products.

Macro approach and potential determinants. The specialised literature, focussing primarily on individual determinants of food consumption, highlights several factors. These factors will be examined at the macro level in our study of European countries. Increased participation in sports at the national level encourages healthier dietary choices, shifting the population's food consumption structure toward a higher intake of vegetables, fruits, and lean proteins such as chicken and fish. This shift often results in reduced consumption of red meats, such as pork and beef, as well as an increased preference for nutrient-dense options, such as seafood, aligning with the nutritional demands of an active lifestyle. The average

purchasing power in a country significantly influences the population's food consumption structure. A higher purchasing power typically increases the consumption of premium products such as beef, fish, and seafood, while a lower purchasing power shifts preferences toward more affordable options such as vegetables, fruits, and chicken. *Cultural indicators* such as Individualism (IDV), Long-Term Orientation (LTO), and Uncertainty Avoidance (UAI) significantly shape a country's food consumption patterns. Higher IDV may lead to diverse diet choices and a focus on convenience, favouring items such as chicken and seafood. Strong LTO encourages sustainable and health-conscious consumption, increasing the demand for vegetables, fruits, and fish. High UAI promotes traditional and familiar foods, such as pork and beef, over exotic or less common options. Other Hofstede dimensions, like Power Distance (PDI) and Masculinity (MAS), are theoretically less relevant, as they primarily influence hierarchical relationships or competitiveness rather than direct food choices.

2. Research methodology

A significant gap in existing research lies in the lack of a comprehensive methodological framework that integrates the economic, cultural, and behavioural determinants of food consumption at the macrolevel. Although previous studies have explored these factors individually, few have used panel econometric techniques to systematically capture their combined effects over time and in multiple countries. This study addresses this limitation by applying robust statistical methods and multisource data integration to provide a more nuanced understanding of food market dynamics and consumer behaviour.

Statistical methodology. The core methodology for validating the study's hypotheses is panel-data econometrics. As an auxiliary element, we use descriptive statistics and graphical representations (maps) to visualise the spatial dynamics of the phenomenon. Maps can also highlight potential behavioural mimicry among geographical neighbours. The empirical analysis is conducted on a sample of 31 European countries, including EU members and associated states, covering the period 2010-2020, as this is the only timeframe for which complete data are available for all study variables. Given the relative stability and low volatility of the variables used in our study (such as Hofstede's cultural factors), no significant structural changes were observed in consumption patterns or explanatory variables due to the COVID-19 pandemic or other external factors. The descriptive statistics and geographic visualisation of the data are considered preliminary analyses that are used to identify potential trends. The confirmatory methodology is based on panel econometrics applied to data from the countries in the sample. Prior to estimation, we conducted standard pre-estimation tests. These steps ensure the robustness of the econometric analysis.

The Breusch-Pagan Lagrange Multiplier (LM) test evaluates whether a random-effects model is justified over an OLS model by testing for significant variation across cross-sectional units. The hypotheses are as follows: H_0 : no random effects, and H_1 : random effects present.

$$LM = \frac{T}{2(N-1)} \sum_{i=1}^N \left(\frac{\sum_{t=1}^T (y_{it} - \bar{y}_i)^2}{\sum_{i=1}^N \sum_{t=1}^T (y_{it} - \bar{y})^2 / (N-1)} - 1 \right)^2 \quad (1)$$

- T represents the number of time periods (3 years: 2010, 2015, 2020),

- N is the number of units (31 countries),
- y_{it} is the value of the dependent variable for country i in period t ,
- $\bar{y}_i$ is the country-level mean of the dependent variable across all time periods,
- $\bar{y}$ is the overall mean of the dependent variable across all countries and time periods.

If the p -value of the LM test is <0.05 , we reject H_0 and conclude that random effects are present, making the random effects model appropriate.

The Hausman test helps to choose between fixed- and random-effects models by checking if individual effects are correlated with explanatory variables, with hypotheses: H_0 : random effects model is appropriate (no correlation) and H_1 : fixed effects model is appropriate (with correlation).

$$H = (\beta_{FE} - \beta_{RE})' (\text{Var}(\beta_{FE}) - \text{Var}(\beta_{RE}))^{-1} (\beta_{FE} - \beta_{RE}) \quad (2)$$

- β_{FE} represents the econometric estimates for the fixed effects model,
- β_{RE} represents the econometric estimates for the random effects model,
- $\text{Var}(\beta_{FE})$ and $\text{Var}(\beta_{RE})$ are the variance matrices for the estimates of the two models.

To use random effects, the Hausman test statistic H should not be statistically significant; that is, the p -value should be greater than the chosen significance level ($\alpha=0.05$). If the p -value > 0.05 , we do not reject the null hypothesis, indicating that the random effects model is appropriate.

In our estimations, the Breusch-Pagan LM and Hausman tests indicate the suitability of using random-effects models. The random-effects model assumes that individual-specific effects are uncorrelated with the explanatory variables, allowing variation across entities (such as countries) to be treated as random and included in the error term, making it more efficient for estimating coefficients when this assumption holds. Unlike the fixed effects model, which controls for all time-invariant characteristics, and the pooled OLS model, which assumes no individual-specific variation, random effects strike a balance by partially accounting for unobserved heterogeneity while retaining efficiency. Our estimations are based on the following regressions:

$$FREQVEGCONS_{it} = \alpha + \beta_1 SPORT_{it} + \beta_2 GDP_PPP_{it} + \beta_3 IDV_{it} + \beta_4 LTO_{it} + \beta_5 UAI_{it} + u_i + \epsilon_{it} \quad (3)$$

$$FREQFRUCONS_{it} = \alpha + \beta_1 SPORT_{it} + \beta_2 GDP_PPP_{it} + \beta_3 IDV_{it} + \beta_4 LTO_{it} + \beta_5 UAI_{it} + u_i + \epsilon_{it} \quad (4)$$

$$POULTRY_TMC_{it} = \alpha + \beta_1 SPORT_{it} + \beta_2 GDP_PPP_{it} + \beta_3 IDV_{it} + \beta_4 LTO_{it} + \beta_5 UAI_{it} + u_i + \epsilon_{it} \quad (5)$$

$$PORK_TMC_{it} = \alpha + \beta_1 SPORT_{it} + \beta_2 GDP_PPP_{it} + \beta_3 IDV_{it} + \beta_4 LTO_{it} + \beta_5 UAI_{it} + u_i + \epsilon_{it} \quad (6)$$

$$BEEF_TMC_{it} = \alpha + \beta_1 SPORT_{it} + \beta_2 GDP_PPP_{it} + \beta_3 IDV_{it} + \beta_4 LTO_{it} + \beta_5 UAI_{it} + u_i + \epsilon_{it} \quad (7)$$

$$FISH_TMC_{it} = \alpha + \beta_1 SPORT_{it} + \beta_2 GDP_PPP_{it} + \beta_3 IDV_{it} + \beta_4 LTO_{it} + \beta_5 UAI_{it} + u_i + \epsilon_{it} \quad (8)$$

- i indexes the observations (31 countries)
- t indexes the time (3 years, 2010, 2015, 2020).

Robustness check. To ensure the reliability of our estimates, we assessed potential multicollinearity and omitted variable bias (OVB). Given the distinct nature of our explanatory variables: economic (GDP_PPP), cultural (Hofstede dimensions), and lifestyle factors (sport participation), collinearity is unlikely. Empirical verification confirms this, with the highest Pearson correlation coefficient observed at 0.27 (between GDP_PPP and sports participation), far below the conventional threshold of 0.7. Regarding OVB, our model incorporates all key determinants identified in the literature that influence food consumption, including economic capacity, cultural orientation, and lifestyle choices. Inclusion of Hofstede dimensions captures deep-seated cultural effects, while GDP_PPP and sports participation control for economic and behavioural influences, reducing the likelihood of unobserved confounders. Additionally, the random effects panel model, validated by the Breusch-Pagan and Hausman tests, accounts for time-invariant heterogeneity between countries. These robustness checks confirm that neither multicollinearity nor omitted variables significantly distort our findings, ensuring the validity of our results.

Definition of variables. Table 1 presents all the variables used in the regressions, explanations of their definitions, and some descriptive statistics.

Table no. 1. Variables used and descriptive statistics

Variable code	Explanations regarding the variables	Mean	Std. Dev. ^{\$}	Min	Max
Dependent variables					
FREQVEGCONS	Frequency of vegetable consumption. Percentage of the adult population who consumes vegetables at least 4 times a week.	70.7	3.72	64	80
FREQFRUCONS	Frequency of fruit consumption. Percentage of the adult population who consumes fruits at least 4 times a week.	49.9	20.6	11	80
POULTRY_TMC	Proportion of poultry in total meat consumption.	22.6	5.50	11.5	36.6
PORK_TMC	Proportion of pork in total meat consumption.	38.4	7.43	26.5	56.8
BEEF_TMC	Proportion of beef in total meat consumption.	17.3	4.97	9.1	31.0
FISH_TMC	Proportion of fish and seafood in total meat consumption.	21.6	6.59	8	35.6
Explanatory variables					
SPORT	The percentage of the population who participates in regular sports, at least once a week.	47.4	18.1	6.3	84.4
GDP_PPP	GDP adjusted for purchasing power parity, divided by the population (the average economic output per person in terms of local purchasing power). Log-transformed values are used in the regressions.	37764	15001	12582	85819

Variable code	Explanations regarding the variables	Mean	Std. Dev. ^s	Min	Max
IDV	Individualism vs. Collectivism. This indicator measures the degree to which individuals in a society are integrated into groups, with high IDV indicating a preference for individual autonomy and low IDV reflecting a focus on group cohesion.	54.4	18.2	20	80
LTO	Long-Term Orientation vs. Short-Term Orientation. This dimension assesses a culture's focus on future rewards, with high LTO favouring long-term planning, perseverance, and thrift, while low LTO emphasises respect for tradition and fulfilling social obligations.	51.9	15.2	19	83
UAI	Uncertainty Avoidance Index. The UAI measures the degree to which a society tolerates ambiguity and uncertainty, with a high UAI indicating a preference for rules and structure, and a low UAI showing greater openness to change and risk.	72.0	20.2	23	100

Note: Std.dev. = standard deviation.

Source: authors' calculations in STATA.

Data are sourced from highly credible international sources. We applied a few transformations to select variables to better align the estimates with the research objectives. The GDP_PPP variable is used in its logarithmic form because income is not linearly proportional to food consumption. Log-transforming GDP_PPP allows for a more accurate representation of its impact on consumption patterns. Additionally, GDP PPP per capita is preferred over nominal GDP per capita because it better reflects the real purchasing power and the cost-of-living differences between countries. The consumption of each meat product is expressed as a relative measure based on the average individual total meat consumption. Absolute consumption would have been overly dependent on each country's purchasing power. By focussing on consumption structure by meat type (POULTRY_TMC, PORK_TMC, BEEF_TMC, FISH_TMC), we capture more of the individual preferences. This approach allows us to better reflect the variation in dietary choices across countries.

$$POULTRY_TMC = \left(\frac{POULTRY_CONS}{POULTRY_CONS + PORK_CONS + BEEF_CONS + FISH_CONS} \right) \times 100 \quad (9)$$

Similarly, the relative consumption weights are defined for POULTRY, BEEF, and FISH.

National cultural values can also affect the structure of food consumption. Of the six cultural dimensions of Hofstede, only three (IDV, LTO, and UAI) have theoretical arguments that support causality in this context. Thus, these dimensions are included in our research as explanatory variables.

The data for this empirical study cover 31 countries, including EU members and associated states. Due to limited data availability for all countries in the world, we focused on this

sample with valid data from the European Statistical Institute. Some variables are sampled at intervals longer than a year, so our dataset includes data for the years 2010, 2015, and 2020. The data are sourced from credible international sources: World Bank – Indicators (2024), Hofstede Insights (2024), OECD (2024), European Commission (2024), and Our World In Data (2024).

3. Results and discussion

3.1. The results of descriptive statistics

The results of descriptive statistics (Table no. 1) indicate that 70.7% of the adult population in EU countries consumes vegetables at least four times a week, with low variability ($SD = 3.72$) between 64% and 80%. This consistency is likely due to widespread health campaigns and the general availability of vegetables throughout the EU. However, fruit consumption at the same frequency is significantly lower, averaging 49.9%, with much higher variability ($SD = 20.6$), ranging from 11% to 80%. This discrepancy may be influenced by regional dietary traditions and seasonal availability. In terms of meat consumption, poultry accounts for 22.6% of total meat consumption, varying between 11.5% and 36.6%, possibly due to its affordability and adaptability in local cuisines. Pork consumption is significantly higher, averaging 38.4% and ranging from 26.5% to 56.8%, reflecting strong cultural preferences and traditional recipes, particularly in central and eastern Europe. Beef constitutes 17.3% of total meat consumption, while fish and seafood make up 21.6%, with some countries consuming up to 35.6%, largely influenced by coastal proximity and long-standing fishing traditions. 47.4% of the population report regular sports participation, with a wide range (6.3% to 84.4%), which can be attributed to differences in national sports policies and lifestyle norms. Economic output per capita, adjusted for purchasing power, averages 37,764 but varies significantly (12,582 to 85,819), indicating economic disparities between EU countries. The individualism index averages 54.4, suggesting a balance between collective and autonomous societal values, while uncertainty avoidance is relatively high at 72, indicating a preference for structured environments, likely influenced by historical regulatory frameworks and institutional stability.

The findings on vegetable and fruit consumption align with Kearney (2010), who highlighted that urbanisation and public health campaigns play a crucial role in increasing vegetable intake, while fruit consumption remains more variable due to seasonal availability and regional dietary preferences. Additionally, the high pork consumption observed in central and eastern Europe supports De Mooij and Hofstede (2011), who emphasise the influence of cultural traditions on dietary habits, particularly in societies with strong culinary heritage and established food practices. These results underscore how public health initiatives and cultural norms shape dietary choices throughout the EU, reflecting the broader interaction between structural and behavioural factors in food consumption trends.

The results show clear regional disparities in sports participation in Europe (Figure no. 1). Denmark and Sweden report the highest participation rates, both at around 75%, reflecting a strong cultural emphasis on physical fitness in northern Europe. Germany and Luxembourg also have high engagement, with more than 60% of the population participating in sports weekly. In Western Europe, participation is moderate, with France at approximately 50% and Belgium at around 45%. In contrast, Southern and Eastern European countries exhibit lower participation rates; Italy reports around 35%, Greece approximately 30%, while Poland has

about 20%, and Romania ranks the lowest, with only 10% participation. These variations highlight a distinct north-south and west-east divide, where wealthier and more developed nations in the north and west tend to have significantly higher sports participation.

Discussion suggests that these findings align with Feldmann and Hamm (2015), who argue that lifestyle choices, shaped by economic conditions and cultural norms, significantly influence health-related behaviours, including sports participation. Higher participation in Northern and Western Europe may be linked to stronger public health initiatives and greater availability of sports facilities. Furthermore, the disparities between regions support the perspective of De Mooij and Hofstede (2011), who highlight those cultural dimensions, such as individualism and long-term orientation, impact engagement in physical activities. Countries with higher levels of individualism and a future-oriented mindset may be more likely to integrate sports into daily life, while regions with lower participation rates might prioritise other social and economic concerns. These results emphasise the role of both economic capacity and cultural values in shaping the trends of sports participation across Europe.

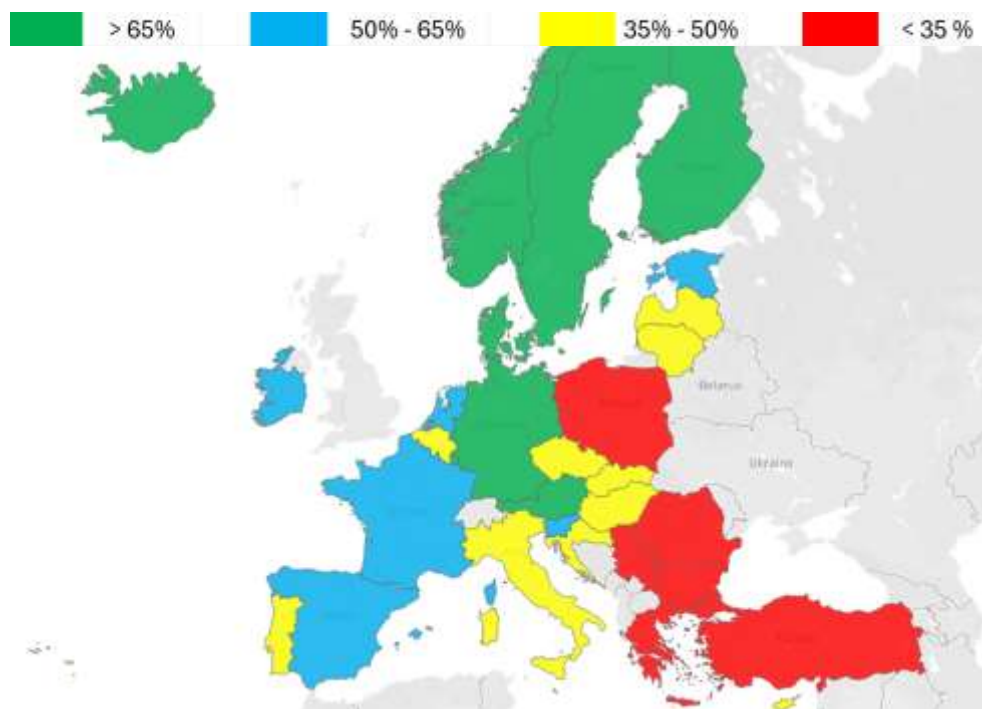


Figure no. 1. The percentage of the adult population that regularly practices sports

Source: authors' calculations in Tableau

The relative consumption of fish and seafood (Figure no. 2), measured as a percentage of total meat consumption, exhibits notable geographical disparities across Europe. Norway leads with the highest share at 42.6%, followed by Portugal (39.2%) and Sweden (32.3%), reflecting a strong preference for fish in the northern and coastal regions. This trend is likely to be shaped by both geographic proximity to the sea and long-standing cultural traditions

that emphasise seafood consumption. Similarly, Malta (31.5%), Finland (30.7%), and Spain (29.1%) report high rates of fish consumption, which align with Mediterranean and Scandinavian dietary patterns. In contrast, landlocked and eastern European countries tend to consume significantly less fish. For example, Serbia (9.1%), Slovakia (9.6%), and Poland (10.8%) have a low reliance on seafood, which may be explained by limited access to fresh seafood and traditional diets that prioritise other protein sources. Turkey has the lowest consumption rate of 5.8%, likely due to cultural preferences and economic constraints, as seafood can be relatively expensive. Countries such as Belgium (27.4%), France (29.2%), and Italy (29.3%) exhibit moderate levels of fish consumption, reflecting a balance between accessibility and traditional culinary preferences. Economic factors also contribute to these patterns, as wealthier nations, such as Luxembourg (27.7%), show a higher likelihood of affording seafood, often regarded a premium food choice. Additionally, health-conscious populations, particularly in Northern Europe, tend to prioritise fish for its perceived nutritional benefits.

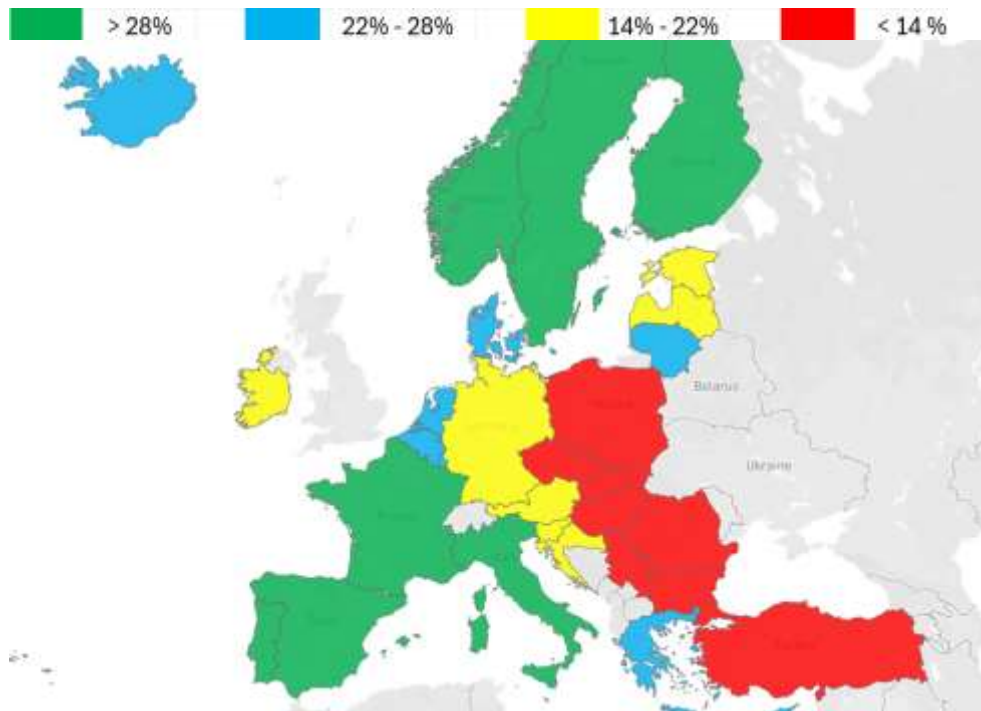


Figure no. 2. Proportion of fish and seafood in total meat consumption

Source: authors' calculations in Tableau

These patterns align with the findings of Kearney (2010), who emphasises the role of economic development and globalisation in shaping food consumption trends. Countries with higher purchasing power and access to global food markets generally display more diverse diets, including a greater emphasis on seafood. Furthermore, the results support Feldmann and Hamm (2015), who highlight that consumer preferences for locally sourced and sustainable foods influence diet trends. The strong reliance on fish in the northern and coastal regions aligns with their findings, suggesting that regional food traditions and environmental

awareness drive the demand for seafood. While cultural heritage and geographical factors clearly shape fish consumption, purchasing power and health consciousness also contribute to the significant variation in seafood intake across Europe.

3.2. Regression results and discussions

The regression analysis (Table no. 2) highlights several key trends in how economic, lifestyle, and cultural factors influence food consumption choices. GDP_PPP significantly increases the consumption of vegetables (coefficient = 8.339, $p < 0.01$) and fruits (coefficient = 3.558, $p < 0.01$) consumption, suggesting that greater purchasing power allows individuals to afford and prioritise healthier foods. However, the relationship between sports participation and vegetable consumption is slightly negative (coefficient = -0.093, $p < 0.1$), potentially indicating that active individuals diversify their diets with foods rich in protein and energy dense. For fruit consumption, sports participation has a significant positive effect (coefficient = 0.373, $p < 0.01$), possibly because physically active individuals seek fruit for its vitamins and antioxidants. In the case of meat consumption, poultry consumption does not show significant associations with the variables examined, strengthening its status as a versatile protein source in different cultures and income levels. Pork consumption is negatively influenced by sports participation (coefficient = -0.142, $p < 0.01$) and GDP_PPP (coefficient = -1.099, $p < 0.01$), suggesting that more physically active and wealthier individuals may prefer leaner meat options. Cultural dimensions also play a role, as individualistic societies (IDV coefficient = -0.108) and those with long-term orientation (LTO coefficient = -0.135) consume less pork, possibly due to ethical concerns or long-term health considerations. On the contrary, beef consumption is positively influenced by sports participation (coefficient = 0.098, $p < 0.01$), GDP_PPP (coefficient = 0.687, $p < 0.01$), and LTO (coefficient = 0.182, $p < 0.01$), suggesting that active individuals and wealthier populations view beef as a source of high quality proteins. Fish consumption follows a similar pattern, with sports participation (coefficient = 0.081, $p < 0.01$), GDP_PPP (coefficient = 0.146, $p < 0.01$), IDV (coefficient = 0.133, $p < 0.05$), and LTO (coefficient = 0.121, $p < 0.05$) all positively influencing fish intake, reinforcing the perception of fish as a sustainable and health conscious diet choice. Across models, GDP_PPP and SPORT consistently emerge as key drivers of food consumption patterns, while cultural factors such as IDV, LTO, and UAI shape specific dietary preferences.

Table no. 2. The effects of determinants on the structure of food consumption: random effects panel estimates (coefficients and z-stat in parentheses)

Dep. Variable	FREQ VEGCONS	FREQ FRUCONS	POULTRY _TMC	PORK _TMC	BEEF _TMC	FISH _TMC
SPORT_FRQ	*-0.093 (-1.89)	***0.373 (2.63)	0.006 (0.10)	***-0.142 (-4.39)	***0.098 (3.46)	***0.081 (2.64)
GDP_PPP	***8.339 (20.7)	***3.558 (4.46)	-0.203 (-0.62)	***-1.099 (-6.02)	***0.687 (4.24)	***0.146 (6.63)
IDV	0.052 (1.09)	0.068 (0.26)	0.003 (0.04)	** -0.108 (-2.01)	0.035 (0.78)	**0.133 (2.56)
LTO	-0.016 (-0.32)	0.193 (0.67)	-0.127 (-1.59)	** -0.135 (-2.16)	***0.182 (3.77)	**0.121 (2.14)

Dep. Variable	FREQ VEGCONS	FREQ FRUCONS	POULTRY _TMC	PORK _TMC	BEEF _TMC	FISH _TMC
UAI	0.070 (1.57)	*0.469 (1.86)	0.070 (0.99)	0.059 (1.08)	-0.068 (-1.61)	-0.027 (-0.54)
Constant	***-19.2 (-3.68)	** -52.54 (-2.11)	***25.92 (3.67)	***65.28 (12.1)	-0.883 (-0.21)	-5.788 (-1.18)
R ² within	0.915	0.778	0.016	0.883	0.782	0.863
R ² between	0.217	0.138	0.115	0.650	0.609	0.600
R ² overall	0.327	0.140	0.115	0.650	0.610	0.601

Note: ***, **, * significant at 1%, 5%, 10%

Source: own calculations in STATA 18

These findings align with Kearney (2010), who highlights the role of economic growth in dietary diversification, showing that wealthier populations have greater access to a variety of foods, including fruits, vegetables, and high-quality protein sources. The negative effect of GDP_PPP on pork consumption also supports Rana and Paul (2017), who found that rising incomes often correlate with a shift toward healthier and organic food choices, potentially reducing the dependence on processed or high-fat meats. The significant influence of sports participation on dietary preferences is consistent with Meyer and Reguant-Closa (2017), who emphasise that athletes and physically active individuals tend to prioritise foods that align with their performance and recovery needs, including lean meat and nutrients-dense foods such as fruits and fish. The role of cultural dimensions such as IDV and LTO in shaping meat and fish consumption is in line with De Mooij and Hofstede (2011), who argue that individualistic societies are more likely to make diet choices based on personal health concerns, while long-term-oriented cultures prioritise sustainable and nutritious foods. Lastly, the findings resonate with Feldmann and Hamm (2015), who discuss how consumer preferences for local and environmentally sustainable food products are shaped by cultural and economic factors, explaining why wealthier, long-term-oriented societies may favour fish over other meats. Together, these comparisons highlight how economic status, lifestyle choices, and cultural values interact to determine food consumption patterns in different regions.

Conclusions

Regression analysis highlights how economic, lifestyle, and cultural factors shape food consumption patterns in European countries. Higher purchasing power consistently increases the consumption of healthier and premium foods, such as vegetables, fruits, beef, and fish, reflecting a preference for quality and health-conscious choices. Regular physical activity, while promoting the consumption of fruits and fish, appears to reduce the preference for pork due to its higher fat content. Cultural indicators, such as individualism (IDV) and long-term orientation (LTO), influence preferences for certain foods, with more individualistic and future-oriented societies favouring options such as fish and beef for their perceived health and sustainability benefits. In general, the analysis underscores the interplay of economic capacity, active lifestyles, and cultural values in the promotion of dietary habits.

The study has *potential limitations* due to its relatively small sample of countries and time points, which may not fully capture long-term trends or broader global patterns. Specific regional dietary traditions and cultural factors unique to different parts of the world might

limit the generalisability of the findings to non-European contexts. Seasonal and regional variations in food availability, particularly for fruits and fish, can also influence the results, adding a layer of complexity not fully addressed. Additionally, differences in economic development within the sample countries could mask nuanced relationships between variables. These factors suggest caution when extending the study's conclusions beyond the analysed context.

Future research could expand the geographic scope to include countries from other regions, allowing comparisons between European and non-European dietary patterns. Longitudinal studies covering more time points would help identify long-term trends and the evolving impact of economic and cultural factors on food consumption. Investigating the role of additional variables, such as environmental sustainability or government policies, could provide a more comprehensive understanding of dietary choices. Finally, incorporating data on seasonal and regional food availability could refine insights into consumption variability and its determinants.

The findings highlight key *policy implications* for stakeholders in the food market, offering actionable recommendations. Economic and cultural changes require food chain actors to align with evolving consumer preferences, particularly for healthier and premium products. Targeted policies should promote sustainable agriculture, nutrition education, and fiscal incentives such as subsidies for organic farming and reduced VAT on fresh produce. Technological advances, including digital marketing and supply chain innovations, are crucial. Governments should support blockchain for traceability, e-commerce for local producers, and research on smart food production. Public-private partnerships can improve efficiency and reduce waste. Sustainability remains critical, requiring stricter environmental standards, incentives for plant-based alternatives, and responsible aquaculture policies. Consumer awareness campaigns can encourage sustainable eating choices. To ensure resilience, SMEs need support in diversifying products, strengthening local supply chains, and accessing new markets. Financial incentives for sustainability and innovation can enhance adaptability. Effective marketing and labelling systems must provide transparency on the origin, nutrition, and environmental impact of food. Aligning food policies with economic, cultural, and technological trends is the key to a resilient, sustainable, and health-conscious food market. A combination of fiscal incentives, regulations, technological investments, and consumer education will drive sustainable consumption patterns across Europe.

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References

- Asamane, E.A., Marinda, P.A., Khayeka-Wandabwa, C. and Powers, H.J., 2021. Nutritional and social contribution of meat in diets: Interplays among young urban and rural men. *Appetite*, 156, art. no. 104959. <https://doi.org/10.1016/j.appet.2020.104959>.
- Ayaviri-Nina, V.D., Quispe-Fernández, G.M., Vanegas, J.L., Ortega-Mejía, V. and Cordero-Ahiman, O.V., 2022. Importance of Purchasing Power and Education in the Food

- Security of Families in Rural Areas—Case Study: Chambo, Ecuador. *Sustainability*, 14(10), art. no. 6068. <https://doi.org/10.3390/su14106068>.
- Bandara, S., Kumara, T., Dharmadasa, S. and Samaraweera, R., 2021. Changes in Food Consumption Patterns in Sri Lanka: Food Security and Sustainability: A Review of Literature. *Open Journal of Social Sciences*, 09(10), pp.213-237. <https://doi.org/10.4236/jss.2021.910016>.
- Birkenhead, K.L. and Slater, G., 2015. A Review of Factors Influencing Athletes' Food Choices. *Sports Medicine*, 45(11), pp.1511-1522. <https://doi.org/10.1007/s40279-015-0372-1>.
- Blisard, N., Lin, B.-H., Cromartie, J. and Ballenger, N., 2002. America's Changing Appetite: Food Consumption and Spending to 2020. *Food Review/National Food Review*, 25(1), pp.2-9. <https://doi.org/10.22004/AG.ECON.266240>.
- Çebi, M., Eliöz, M., Yamak, B., İmamoğlu, O. and Aksoy, Y., 2020. Investigation of food consumption frequency in sports faculty students: Food Consumption of Faculty Students. *Progress in Nutrition*, 22(2), pp.507-514. <https://doi.org/10.23751/pn.v22i2.9253>.
- Cui, P., Li, M., Yu, M., Liu, Y., Ding, Y., Liu, W. and Liu, J., 2022. Advances in sports food: Sports nutrition, food manufacture, opportunities and challenges. *Food Research International*, 157, art. no. 111258. <https://doi.org/10.1016/j.foodres.2022.111258>.
- Dagevos, H. and Van Ophem, J., 2013. Food consumption value: Developing a consumer-centred concept of value in the field of food. *British Food Journal*, 115(10), pp.1473-1486. <https://doi.org/10.1108/BJFJ-06-2011-0166>.
- De Mooij, M. and Hofstede, G., 2011. Cross-cultural consumer behavior: A review of research findings. *Journal of International Consumer Marketing*, 23(3-4), pp.181-192. <https://doi.org/10.1080/08961530.2011.578057>.
- Djekic, I., Bartkiene, E., Szűcs, V., Tarcea, M., Klarin, I., Černelić-Bizjak, M., Isoldi, K., El-Kenawy, A., Ferreira, V., Klava, D., Korzeniowska, M., Vittadini, E., Leal, M., Frez-Muñoz, L., Papageorgiou, M. and Guiné, R.P.F., 2021. Cultural dimensions associated with food choice: A survey based multi-country study. *International Journal of Gastronomy and Food Science*, 26(1), art. no. 100414. <https://doi.org/10.1016/j.ijgfs.2021.100414>.
- European Commission, 2024. *Per capita fruit, vegetable, and meat consumption in EU member states*. [online] Available at: <https://agriculture.ec.europa.eu/document/download/f7f2ff54-cf54-432f-9e52-b5fca9976d71_en?filename=agricultural-outlook-2024-executive-summary_en.pdf> [Accessed 11 November 2024].
- Fallo, Y., Nuhriwangsa, A.M.P. and Hanim, D., 2019. Purchasing power, fruits vegetables consumption, nutrition status among elementary school student. *International Journal of Public Health Science (IJPHS)*, 8(1), p.70. <https://doi.org/10.11591/ijphs.v8i1.16304>.
- Feldmann, C. and Hamm, U., 2015. Consumers' perceptions and preferences for local food: A review. *Food Quality and Preference*, 40, pp.152-164. <https://doi.org/10.1016/j.foodqual.2014.09.014>.
- Fieldhouse, P., 2013. *Food and Nutrition*. Boston, MA: Springer US. <https://doi.org/10.1007/978-1-4899-3256-3>.
- Hartman- Petrycka, M., Lebiedowska, A., Kamińska, M., Krusiec- Świdergoł, B., Błońska- Fajfrowska, B., Witkoś, J. and Wilczyński, S., 2024. Who likes meat, fish, and seafood? Influence of sex, age, body mass index, smoking, and olfactory efficiency on meat product preferences. *Food Science & Nutrition*, 12(9), pp.6799-6809. <https://doi.org/10.1002/fsn3.4275>.

- Ho, K.F.X., Liu, F., Tarabashkina, L. and Volery, T., 2022. Cross-cultural differences in consumers' attention to food labels. *British Food Journal*, 124(12), pp.4888-4904. <https://doi.org/10.1108/BFJ-07-2021-0751>.
- Hofstede Insights., 2024. *Country comparison: Cultural dimensions data*. [online] Available at: <<https://www.hofstede-insights.com>> [Accessed 11 November 2024].
- Kearney, J., 2010. Food consumption trends and drivers. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 365(1554), pp.2793-2807. <https://doi.org/10.1098/rstb.2010.0149>.
- Larson, R.B., 2004. New market groupings based on food consumption patterns. *Agribusiness*, 20(4), pp.417-432. <https://doi.org/10.1002/agr.20027>.
- Meyer, N. and Reguant-Closa, A., 2017. "Eat as If You Could Save the Planet and Win!" Sustainability Integration into Nutrition for Exercise and Sport. *Nutrients*, 9(4), art. no. 412. <https://doi.org/10.3390/nu9040412>.
- Nemeth, N., Rudnak, I., Ymeri, P. and Fogarassy, C., 2019. The Role of Cultural Factors in Sustainable Food Consumption—An Investigation of the Consumption Habits among International Students in Hungary. *Sustainability*, 11(11), art. no. 3052. <https://doi.org/10.3390/su11113052>.
- OECD, 2024. *Food consumption and nutrition data*. [online] Available at: <https://www.oecd.org/en/publications/oecd-fao-agricultural-outlook-2024-2033_4c5d2c5b-en.html> [Accessed 11 November 2024].
- Our World in Data., 2024. *Global fruit, vegetable, and meat consumption data*. [online] Available at: <<https://ourworldindata.org>> [Accessed 17 November 2024].
- Rana, J. and Paul, J., 2017. Consumer behavior and purchase intention for organic food: A review and research agenda. *Journal of Retailing and Consumer Services*, 38, pp.157-165. <https://doi.org/10.1016/j.jretconser.2017.06.004>.
- Sun, T., Horn, M. and Merritt, D., 2009. Impacts of cultural dimensions on healthy diet through public self- consciousness. *Journal of Consumer Marketing*, 26(4), pp.241-250. <https://doi.org/10.1108/07363760910965846>.
- World Bank., 2024. *World development indicators: GDP per capita, PPP (current international \$)*. [online] Available at: <<https://data.worldbank.org>> [Accessed 15 November 2024].
- Zhang, T., Grunert, K.G. and Zhou, Y., 2020. A values–beliefs–attitude model of local food consumption: An empirical study in China and Denmark. *Food Quality and Preference*, 83, art. no.103916. <https://doi.org/10.1016/j.foodqual.2020.103916>.