UNIVERSITY OF LIFE SCIENCES ”KING MIHAI I” FROM TIMISOARA
”YOUNG PEOPLE AND MULTIDISCIPLINARY RESEARCH IN APPLIED LIFE SCIENCES”

05-06 November 2026



HOUSEHOLD FOOD WASTE IN EUROPE: THE ECONOMIC COST OF UNSUSTAINABLE CONSUMPTION

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Abstract: *The Household food waste represents a significant challenge to sustainable consumption, generating substantial financial losses and contributing to the inefficient allocation of economic resources. This study aims to assess the scale and economic implications of household food waste in Europe, identify cross-country disparities, and examine its relationship with economic development. The research employs descriptive and inferential statistical methods, including frequency distribution analysis, normality testing, and Pearson correlation analysis. The empirical investigation covers 29 European countries using data for 2023, complemented by an analysis of household food waste trends in the European Union during 2020–2024. The findings reveal considerable disparities, with annual household food waste ranging from 26 to 103 kg per capita. Correlation analysis indicates a weak and statistically insignificant relationship between GDP per capita and household food waste ($r = -0.116$; $p = 0.550$), suggesting that economic prosperity alone cannot explain variations in food waste levels. Furthermore, estimates of the monetary value of discarded food highlight the financial burden of inefficient consumption and its implications for household expenditure and resource allocation. The study emphasizes the economic consequences of household food waste and the importance of promoting more efficient and sustainable consumption practices across Europe.*

• Introduction

Household food waste remains a major economic and environmental challenge in Europe, contributing to the inefficient use of food, financial resources, and natural resources. Despite growing efforts to reduce food waste, substantial differences persist across European countries. This study examines the scale and distribution of household food waste, focusing on differences between countries and the relationship between food waste per capita and economic development, measured by GDP per capita. The research aims to determine whether higher levels of economic prosperity are associated with lower household food waste.



• Material and method

The The study is based on Eurostat data on household food waste and GDP per capita in European countries. The analysis examines household food waste trends in the EU during 2020–2024 and compares 29 European countries (27 EU Member States, Norway, and Iceland) using country-level data for 2023.

Statistical analysis was performed using RStudio. Countries were grouped into six classes according to Sturges’ formula to examine the frequency distribution of household food waste per capita. The Shapiro–Wilk test was applied to assess normality, while Pearson’s and Spearman’s correlation coefficients were calculated to investigate the relationship between household food waste and GDP per capita. A simple linear regression was also used to assess the strength of this relationship.

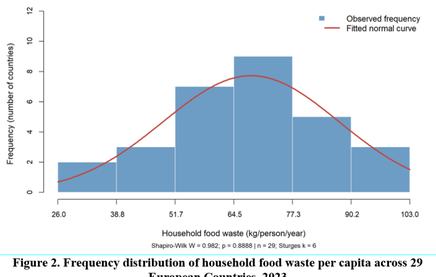


Figure 2. Frequency distribution of household food waste per capita across 29 European Countries, 2023
Source : Authors' statistical analysis and visualization based on Eurostat data [1], *using RStudio*

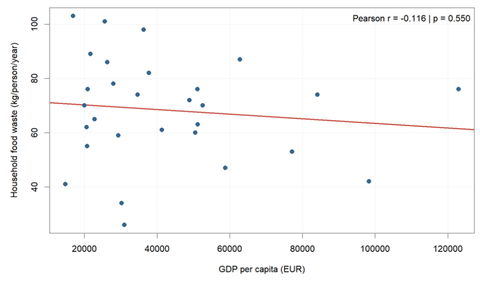


Figure 3. Relationship between household food waste and GDP per capita across 29 European countries, 2023
Source : Authors' statistical analysis based on Eurostat data [1], *using RStudio*

• Results and discussions

Household food waste in the EU remained relatively stable during 2020–2024, fluctuating between 30.5 and 31.5 million tonnes annually, with no sustained downward trend.

The analysis of 29 European countries revealed substantial differences in household food waste per capita, ranging from 26 to 103 kg annually. More than half of the countries (55.2%) recorded values between approximately 52 and 77 kg per person. The Shapiro–Wilk test ($W = 0.982$; $p = 0.8888$) indicated no statistically significant deviation from normality.

The relationship between household food waste and GDP per capita was very weak and statistically insignificant (Pearson $r = -0.116$; $p = 0.550$). Spearman’s correlation confirmed this finding ($\rho = -0.115$; $p = 0.553$), while the regression model explained only 1.34% of the observed variation ($R^2 = 0.0134$).

These results suggest that economic prosperity alone does not adequately explain differences in household food waste across European countries. Other socioeconomic and behavioral factors may play an important role in shaping household food waste patterns.

• Conclusions

AI The study reveals that household food waste remains a persistent challenge in the European Union, with no substantial reduction observed during 2020–2024. Considerable differences in food waste per capita were identified across the 29 European countries analyzed.

The correlation analysis found no statistically significant relationship between household food waste and GDP per capita, indicating that economic prosperity alone is insufficient to explain national differences.

These findings highlight the need to consider household consumption habits, consumer awareness, and food management practices when developing waste prevention strategies. Further research incorporating behavioral and socioeconomic indicators could provide a more comprehensive explanation of household food waste patterns and support more effective reduction measures.