

## Abstract

Food waste is among the most critical sustainability issues of the 21st century, associated with serious environmental, economic, and social consequences. This paper investigates food waste management in Kosovo's urban households, focusing on consumer behavior, drivers of waste generation, and citizens' attitudes toward measures for its reduction. In total, 305 households were interviewed in seven regions. The sample predominantly consisted of females (71.1%) and young adults aged between 18-25 years old (41.6%). It seemed that 35.7% of households throw away food one to two times a week, while 20.7% do so almost every day. Dinner was the meal at which most food was wasted, and there was an extreme increase in the amount of discarded food during festivities (86.6%). Insufficient meal planning, inadequate storing of food, and over-purchasing of food lead to food wastage. Alcoholic beverages, spoiled fruits and vegetables, fast food, and frozen products were the most regularly thrown away products, whereas staple products such as cheese, eggs, and milk were discarded less frequently. In general, findings point to the multilayered nature of food waste in urban Kosovo, stipulating the need for an integrated approach which entails education, improvements in infrastructure, and effective policy measures.

**Keywords:** food waste, urban households, consumer behavior, waste management.

## Background

Food waste is a critical sustainability challenge, accounting for approximately 8–10% of global greenhouse gas emissions and representing a major loss of natural resources, economic value, and social equity. Urban households are among the largest contributors to food waste generation, driven by changing consumption patterns, lifestyle constraints, and limited awareness of food management practices. In Kosovo, rapid urbanization and evolving dietary habits have increased pressure on household food systems. However, empirical evidence on urban food waste behavior remains limited, constraining the development of targeted prevention policies. Understanding the drivers, patterns, and impacts of food waste at the household level is essential for designing effective interventions aligned with SDG 12.3 and the objectives of COST Action FoodWaStop (CA22134). Therefore, the aim of the study was to assess food waste generation, behavioral drivers, and management practices in urban households in Kosovo.

## Results

### Research methodology

Methodological Component	Description
Study design	Cross-sectional descriptive study based on a structured household survey
Research method	Questionnaire-based survey (quantitative approach)
Sample size	305 respondents (urban households)
Data collection modes	Face-to-face interviews (n = 120); Online survey via LimeSurvey (n = 185)
Study period	10 months (December 2024 – September 2025)
Geographical coverage	Urban areas of Kosovo
Target population	Adult members of urban households responsible for food purchasing and management
Questionnaire structure	Three sections: (1) Socio-demographic characteristics; (2) Food purchasing, storage, and consumption practices; (3) Food waste types, quantities, challenges, and impacts
Key variables collected	Gender, age, education, employment status, household size; food purchasing behavior; food waste frequency and categories; perceived economic, social, and environmental impacts
Statistical software	SPSS, version 22
Descriptive analysis	Frequencies, percentages, and summary statistics
Inferential analysis	Chi-square test (categorical variables); Independent samples t-test (two-group comparisons); One-way ANOVA (multi-group comparisons)
Statistical significance	p < 0.05 considered statistically significant
Ethical considerations	Voluntary participation and anonymous data processing

Category	Key Indicator	Dominant Response(s)	n	%
Geographical distribution	Main urban region	Gjakova	118	38.7
		Prishtina	83	27.2
Age profile	Dominant age group	18–25 years	127	41.6
Gender	Majority gender	Female	217	71.1
Education level	Highest share	Secondary education	146	47.9
Employment status	Most common status	Employed ≥40 hours/week	113	37.0
Household composition	Predominant structure	Couple with children	195	63.9
Living with children	Households with children	Yes (any age)	179	58.7
Food waste frequency	Most reported frequency	1–2 times per week	109	35.7
Grocery shopping frequency	Most common pattern	Weekly	100	32.8
Use of shopping list	Do not use shopping list	No	186	61.0
Fresh food storage	Most common practice	Refrigerator only	155	50.8
Leftover consumption	Typical behavior	Sometimes	148	48.5
Meal with highest waste	Main waste hotspot	Dinner	228	74.8
Festive food waste	Increased waste during holidays	Yes	264	86.6
Waste reduction strategies	Most used strategy	Purchasing smaller package sizes	109	35.7
		Weekly menu-based shopping lists	84	27.5
		Portioning and freezing food	64	21.0

Thematic Area	Indicator	Dominant Response	n	%
Main drivers of food waste	Buying large quantities of food	Sometimes / Often	215	70.5
	Long time between shopping trips leading to spoilage	Sometimes / Often	216	70.8
	Miscalculation of needed quantities	Sometimes	138	45.2
	Fear of food shortage at home	Sometimes / Often	226	74.1
	Cooking excessive amounts of food	Sometimes / Often	220	72.1
	Forgetting food until it expires or spoils	Sometimes / Often	200	65.5
Perceived impacts of food waste	Dislike of leftover food	Sometimes	112	36.7
	Environmental consequences	Agree / Strongly agree	284	93.1
	Waste of natural resources (water, energy, land)	Agree / Strongly agree	273	89.5
	Contribution to global warming	Agree / Strongly agree	258	84.5
	Economic impact on household	Agree / Strongly agree	268	87.8
Preferred food waste prevention measures	Ethical concern (immoral behavior)	Agree / Strongly agree	237	77.7
	Increased pollution from waste disposal	Agree / Strongly agree	274	89.9
	Raising environmental awareness	Very useful	263	86.2
	Raising awareness of economic impacts	Very useful	244	80.0
	Education within formal education system	Very useful	229	75.1
Smaller packaging sizes	Very useful	191	62.6	
Waste-based taxation	Very useful	154	50.5	

## Conclusion

Food waste in urban Kosovo is frequent, systematic, and behavior-driven. Dinner meals and festive periods represent critical hotspots. Effective reduction requires integrated educational, infrastructural, and policy interventions, providing strong evidence for urban food waste prevention strategies.

**Acknowledgments:** This poster/publication is based upon work from COST Action FoodWaStop (CA22134), supported by COST (European Cooperation in Science and Technology).

Variable	Significant Effects	Key Insights
Household Size	Avg Household Size: 5.33 ± 0.106 people	Larger households tend to have more food waste, but the impact on specific waste types varies.
Food Spending	Avg Monthly Food Spending: 2.71 ± 0.051	Higher spending correlates with more food waste, especially with processed foods.
Types of Food Waste (in last 7 days)	- High Waste: Alcoholic beverages, non-fresh fruits/vegetables, frozen foods	Processed and packaged foods (alcohol, sweets, frozen) have higher wastage rates.
Perceptions on Food Waste	Ethical Issue: 1.98 ± 0.039 (immoral)	Strong agreement that food waste is unethical, but varies by demographics (e.g., younger people more likely to agree).
Environmental Impact	Environmental Consequences: 1.74 ± 0.033	Participants strongly agree that food waste harms the environment.
Economic Impact	Economic Consequences: 1.86 ± 0.038	Perceived economic and social consequences are highly recognized, especially among families.
Waste Reduction Measures	Most Effective Measures: Raising awareness on environmental and economic impact (1.23 ± 0.037)	Citizens see environmental awareness campaigns as one of the most useful measures.
Demographics and Attitudes	Gender, Age & Education: Significant impact on attitudes toward waste (p-values range from 0.001 to 0.791)	Young adults (18-30) and those with higher education levels are more aware of food waste's ethical, environmental, and economic consequences.
Living with Children	Food Waste Challenges: Family households (with children) face more storage-related issues (e.g., 48% with minors)	Families with children report greater challenges in reducing food waste, especially in storage and awareness.
Shopping Frequency	Frequency: Weekly shoppers tend to waste more food	Households shopping more often (weekly or bi-weekly) have higher food waste, possibly due to over-purchasing or spoilage.

Variable	Key Finding*	Effect Size/Statistical Value	Interpretation
Gender Differences in Food Spending	NS	t = -0.383, p = 0.702	Female and male groups spend similar amounts on food, with no statistically significant difference.
Gender Differences in Food Waste Reduction Strategies	NS	t = -1.497, p = 0.137	Both females and males practice food waste reduction strategies at similar rates.
Age and Family Size	p > 0.05	F = 3.198, p = 0.001	Significant differences in the average number of family members across different age groups. Younger age groups (18–25) have larger families compared to older age groups (56–60).
Education and Family Size	NS	F = 2.457, p = 0.063	Education level does not significantly impact the number of family members.
Region and Family Size	NS	F = 1.766, p = 0.106	Family size does not significantly differ across different regions of Kosovo.
Income and Family Size	NS	F = 1.819, p = 0.144	Monthly income does not significantly impact the number of family members.
Age Group Comparisons	p > 0.05	Mean Difference = 1.607, p = 0.009	The 18–25 age group has statistically more family members than the 56–60 age group. Other age comparisons were not significant.

\* NS=Non significant effect at level of p > 0.05

## Discussions

The study reveals that urban household food waste as a behavior-driven system with significant sustainability implications. Key drivers include over-purchasing, poor meal planning, and festive consumption practices, which collectively lead to systematic food waste at the household level, as evidenced by data from 305 urban households in Kosovo. This waste results in environmental impacts such as increased greenhouse gas emissions, economic losses, and social challenges related to equity and food insecurity. The framework highlights the need for integrated, multi-level solutions combining education, improved food management practices, and supportive policies to achieve SDG 12.3.



Figure 1. Conceptual Framework of Urban Household Food Waste Drivers, Impacts, and Prevention Pathways