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HOUSEHOLD FOOD WASTE: CAUSES AND REDUCTION STRATEGIES IN TAURAGĖ COUNTY

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Abstract
This article investigates the drivers and manifestations of household food waste, reviews prevailing methodological approaches in food waste research, and presents the design and outcomes of an empirical case study. The analysis demonstrates that food waste most often results from excessive purchasing, insufficient meal planning, and limited attention to product expiration dates. While respondents acknowledged the significance of the issue, they nevertheless continued to encounter leftover or expired food in everyday practice. Mitigation strategies identified in the study highlight the importance of education starting from early schooling, the establishment of food-sharing initiatives, and adjustments in retail practices such as broader availability of products sold by weight. Although the empirical evidence derives from households in Tauragė County, Lithuania, the findings reflect broader patterns observable in many contexts and underscore the need for strengthening both consumer awareness and systemic measures to reduce food waste globally.

Keywords: *Food Waste, Household, Tauragė County.*
JEL Codes: *E22, F21.*

Introduction

Goodwin (2023) emphasizes that one-third of all food produced globally is lost or wasted along the supply chain—from farmers to households amounting to more than one billion tons annually. In caloric terms, this corresponds to 24 percent of food worldwide remaining unconsumed, while simultaneously one in ten people suffers from hunger. Such losses and waste not only undermine human health and nutrition but also generate severe economic and environmental consequences. Each year, food waste costs the global economy over USD 1 trillion and contributes approximately 8–10 percent of total global greenhouse gas emissions, thereby exacerbating climate change. Recognizing the urgency of the issue, the United Nations has incorporated food waste reduction into its 2030 Agenda for Sustainable Development. Specifically, Sustainable Development Goal (SDG) 12 calls for halving global food waste at the retail and consumer levels and significantly reducing losses along supply chains by 2030. Achieving these targets requires a comprehensive understanding of the diverse drivers of food waste and its substantial economic, environmental, and social costs (United Nations, 2022).

The present study addresses the following **research problem:** *What are the main causes of food waste in Tauragė County households, what possibilities exist for its reduction, and how can these dimensions be empirically measured?* **The research objective** is to identify the principal causes of food waste and to propose potential mitigation strategies within households in Tauragė County. To accomplish this objective, the study formulates the following tasks:

1. To present the problem of food waste and establish the methodological framework for investigating its causes and reduction strategies in households.

2. To analyze the causes of food waste in Tauragė County and identify feasible opportunities for its mitigation.

The findings are expected to hold practical applicability beyond Tauragė County, offering a comparative framework for other regions grappling with similar socio-economic and environmental challenges. Ultimately, this research contributes to advancing sustainable development goals by addressing one of the most pressing issues in contemporary food systems household food waste reduction.

Literature review

Food waste originates at the earliest stages of the supply chain, beginning on farms. A wide array of direct and indirect factors contributes to losses at this level. Among the most immediate and least controllable are biological and environmental conditions. Crops are frequently damaged by pests, diseases, and climate-related variables, including soil quality, water availability, extreme weather events, and natural disasters (Shukla, 2022).

Technological and infrastructural deficiencies represent another major source of waste. Insufficient storage facilities, suboptimal harvesting practices, inadequate regulation of product temperature during harvest, inappropriate fishing gear, and lack of refrigeration for landed catch often result in significant post-harvest losses. Without adequate preservation systems, farmers are frequently compelled to sell perishable produce regardless of market conditions or to discard it altogether (Shukla, 2022).

Structural inefficiencies within the retail sector further exacerbate farm level waste. Supermarkets and large-scale retailers impose stringent cosmetic standards that prioritize size, shape, and color over nutritional quality, flavor, or overall wholesomeness. These requirements force suppliers to discard substantial portions of otherwise edible produce that fail to conform to aesthetic specifications (Shukla, 2022). Similarly, Raak et al. (2017) note that logistical operations introduce risks of mechanical damage, particularly to fresh produce, which is highly susceptible to deformation and microbial contamination during transport and packaging. Such vulnerabilities explain why items such as strawberries, raspberries, avocados, and broccoli account for a disproportionate share of food waste. Products excluded from primary retail channels are often diverted to secondary markets at lower prices, reinforcing systemic inefficiencies (Feedback & Rockefeller Foundation, 2017).

At the consumer level, households represent the single largest source of global food waste. Approximately two-thirds of household food waste results from spoilage, driven by inadequate storage, malfunctioning refrigeration, and poor estimation of household needs. The remaining share is linked to over-preparation, excessive portion sizes, and the subsequent neglect of leftovers (FoodPrint, 2018). Consumer misunderstanding of food labeling further amplifies waste: nearly 70 percent of individuals prematurely dispose of products due to confusion regarding “best before” and “use by” dates.

The scale of the issue is striking. Lai (2021) estimates that one-third of global food supplies equivalent to up to 2.5 billion tons annually are wasted or lost. These losses carry profound implications for environmental sustainability, food security, and nutrition. Rising global demand for food, coupled with systemic inefficiencies, contributes to land degradation, deforestation, and biodiversity loss by leaving fertile land underutilized or mismanaged. As Lewis (2022) emphasizes, the waste of food simultaneously represents the waste of land, water, energy, and other critical inputs. Food waste accounts for nearly one-third of anthropogenic greenhouse gas emissions, with roughly 8 percent generated annually through its production and disposal. Agriculture alone consumes 70 percent of global freshwater resources; when food is discarded, this water is lost as well. The Natural Resources Defense Council (NRDC) estimates that food waste depletes one-quarter of the world’s freshwater reserves equivalent to USD 172 billion in water losses alongside over USD 220 billion in unnecessary costs for cultivation, transportation, and processing. Illustratively, discarding one kilogram of beef equates to wasting 50,000 liters of

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water, while pouring out a glass of milk corresponds to nearly 1,000 liters (Lewis, 2022).

The environmental costs extend beyond resource inefficiencies. Decomposing food in landfills generates methane, a greenhouse gas with 25 times the warming potential of carbon dioxide. Boyle (2023) estimates that food waste is responsible for nearly 20 percent of global methane emissions. If food waste were a nation, it would rank third globally in greenhouse gas emissions, after the United States and China. Moreover, agricultural expansion driven by inefficient food systems fragments habitats, diminishes biodiversity, and accelerates ecosystem decline (Lauria, 2024). Related externalities include soil and water contamination from microplastics, heavy metals, and pathogens, as well as eutrophication, groundwater pollution, and land acidification (O'Connor et al., 2022).

The social implications are equally pressing. Food waste occurs alongside persistent global hunger and malnutrition, affecting over 820 million people worldwide, while an additional 2 billion suffer from micronutrient deficiencies (ECEPL, 2023). The coexistence of widespread hunger and excessive waste highlights a paradox at the heart of the global food system. In some contexts, food waste exacerbates undernutrition; in others, it fuels overconsumption and obesity, underscoring the uneven distribution of food across populations.

Economic repercussions are similarly profound. As Kotykova and Babych (2019) argue, food waste undermines profitability across the supply chain. Farmers, processors, and manufacturers bear unrecovered costs of seeds, fertilizers, water, labor, and packaging for food that is ultimately discarded. Gorter et al. (2021) add that households also face direct financial burdens, while systemic inefficiencies contribute to elevated food prices. Increased demand for land, water, and energy inputs driven partly by waste further inflates production costs, which are eventually passed on to consumers.

Taken together, the evidence demonstrates that food waste is a systemic issue with interlinked environmental, social, and economic dimensions. Reducing waste requires interventions that span the entire supply chain, from primary production to household consumption. Beyond its potential to alleviate hunger and reduce costs, addressing food waste represents one of the most effective strategies for mitigating climate change, conserving natural resources, and advancing global sustainability.

Methodology

Studies on food waste typically employ both qualitative and quantitative methods. The causes of food waste have been investigated in various countries, with selected research presented in Table 1.

Table 1. Food waste research and key findings

Scholars	Research focus	Key findings
Stefan et al. (2013)	Psychological aspects of household behavior in Romania; survey-based study	Low environmental awareness and limited perception of food value contributed to higher levels of waste. Participants who did not perceive themselves as responsible for environmental impacts discarded significantly more food.
Aschemann-Witzel et al. (2015)	Causes of consumer food waste and potential interventions; expert interviews and literature review	Identified key drivers of waste: over-purchasing, improper storage, impulsive buying, emphasis on food appearance, and price promotions (discounts).
Secondi, Principato & Laureti (2015)	Household food waste behavior across 27 EU countries; multi-level analysis	Higher GDP levels correlated with greater household waste. Waste patterns were influenced by planning habits, awareness, and institutional

		policies. Cultural and economic factors explained cross-country differences.
Qi & Roe (2016)	Consumer awareness, attitudes, and perceptions of food waste; survey and regression analysis	Insufficient awareness and limited consciousness of food waste were directly associated with higher levels of waste.
Schanes, Dobernig & Gözet (2018)	Causes of household food waste; literature review	Major causes included poor planning, uncertainty about expiration dates, inadequate storage, and habitual household practices. Feelings of guilt were more strongly linked to financial loss than to environmental or social concerns.
Geffen et al. (2020)	Behavioral interventions in European households; focus group study in the Netherlands	Simple behavioral tools, such as shopping lists and planning reminders, reduced food waste by approximately 20%.
Neira (2024)	Factors influencing food waste in Swedish households; mixed methods (surveys, interviews, diaries, statistical analysis)	Key causes included poor planning, over-purchasing, and inaccurate portioning. Differences emerged across demographic groups: younger individuals wasted more food than older ones.

The issue of food waste is relevant not only in Lithuania but also globally. In order to identify the main causes of food waste and to evaluate possible reduction strategies in Tauragė County, a quantitative study was conducted, surveying residents of the region. A one-time questionnaire survey was chosen as an appropriate method for collecting data from a broad segment of the population.

The aim of the empirical study was to determine the principal causes of food waste and the potential opportunities for reducing food waste in households in Tauragė County.

Research organization. To maximize participation from residents of Tauragė County, the questionnaire was made available online via www.apklausa.lt. It was also distributed across various social networks and community groups. The survey was conducted from October 3, 2024, to December 10, 2024, yielding responses from 406 participants

Research Results and Discussion

The empirical findings provide insights into the overall attitudes of households in Tauragė County towards food waste, their understanding of product labeling, and their purchasing and meal-planning habits. The results indicate that the majority of respondents (75%) correctly distinguish between the labeling "Best before…" and "Use by…". Although 71% of respondents reported planning their shopping baskets, as many as 85% admitted discarding unused products due to expiration, suggesting that households tend to purchase more than they are able to consume.

It is noteworthy that more than half of the respondents (61%) stated they do not consume all of the food prepared at home, while 60% reported failing to use food before it spoils. This highlights a lack of effective portion planning for prepared meals.

The analysis further revealed a paradox: most respondents acknowledged that food waste is an important issue and expressed the need for more information on how to reduce it. While answers demonstrate a level of awareness regarding the significance of food waste, other responses reveal gaps between intentions and practices. For example, although households claim to plan shopping baskets, check expiration dates, and understand labeling, their actual behaviors suggest irrational purchasing, inadequate portion control, and potential discarding of food that may still be consumable.

To quantify the extent of household food waste, respondents were asked to indicate the

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average amount of food discarded per week. The majority (76%) reported wasting up to 1 kg weekly. While this may appear modest, when scaled across all households, the cumulative amount becomes significant. Additionally, 13% reported wasting 1–2 kg weekly, 5% discarded 2–3 kg, and 2% admitted wasting as much as 3–5 kg per week. The higher amounts reported are particularly concerning, as they indicate severe levels of waste.

The empirical study also examined which categories of food were most frequently wasted. These results are presented in Figure 1.

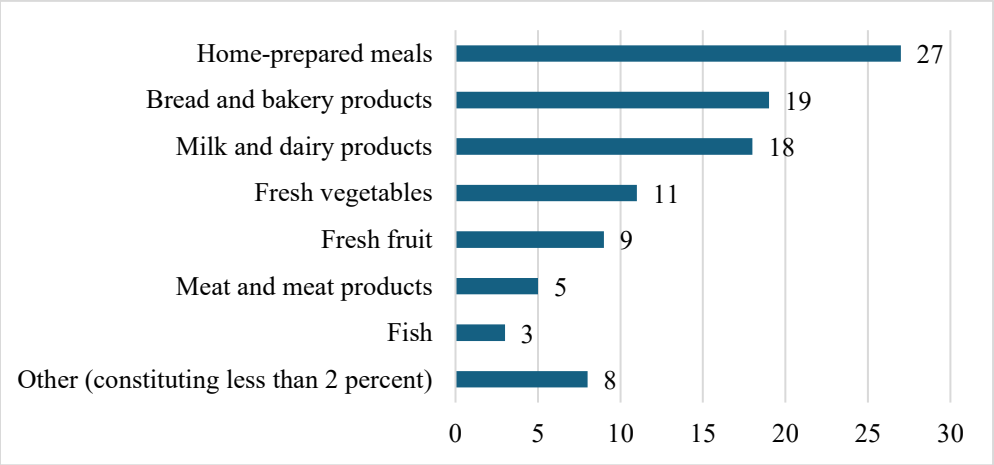

Figure 1. Food products most frequently discarded in households

The data reveal that the largest share of food waste consists of home-prepared meals (27%), followed by bread and bakery products (19%), milk and dairy products (18%), fresh vegetables (11%), and fresh fruit (9%). This suggests that perishable, everyday products are most at risk of being wasted. These findings underscore two key issues: inadequate food planning and over-purchasing. Many of the most frequently discarded products could be reused, recycled, or consumed in alternative ways but instead end up as waste.

In addition to identifying product categories, the survey examined the main reasons why households discard food (Figure 2).

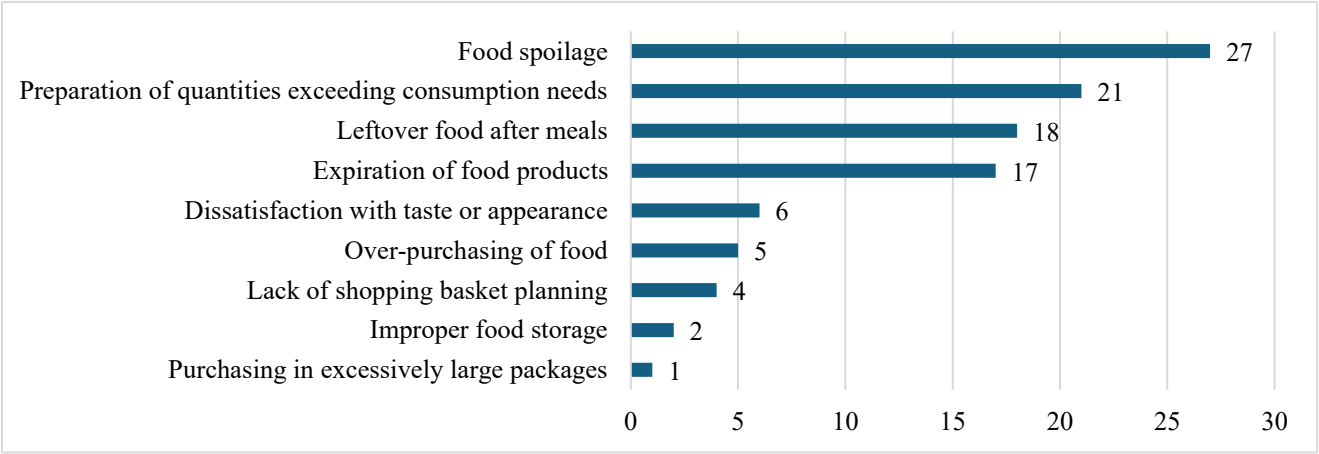

Figure 2. Reasons cited by respondents for discarding food

The most commonly reported reason was spoilage (27%) food becoming moldy, emitting unpleasant odors, or otherwise deteriorating before consumption. Other major reasons included preparing excessive quantities of food (21%) and leftovers after meals (18%), both of which indicate inefficient meal planning and inaccurate portioning. Furthermore, 17% of respondents admitted discarding food due to expired use-by dates, which may be linked to stockpiling behaviors or insufficient attention to storage practices. Less frequently cited reasons included purchasing excessive quantities, improper storage, or food being deemed unacceptable due to taste or appearance.

Overall, the findings from Tauragė County show that the primary drivers of household food waste are over-purchasing, insufficient planning, and neglect of expiration dates. These results are consistent with broader trends observed across Lithuania and the European Union. However, the Tauragė case also revealed additional factors, such as limited consumer awareness of labeling and restricted availability of small packaging sizes.

Respondents also provided specific suggestions for reducing food waste in Tauragė County, as summarized in Table 2.

Table 2. Respondents' suggestions for reducing food waste in Tauragė County

Suggested measures to reduce food waste	Number of respondents
No suggestions	52
More frequent public education through media, local newspapers, and online platforms; collection and publication of municipal statistics	36
Establish drop-off points (refrigerators or collection stations) for surplus or soon-to-expire food	20
Begin food waste education in kindergartens and schools	18
Supermarkets should donate, rather than discard, unsold food	16
Offer more unpackaged products to allow consumers to buy only the needed amount	10
Encourage dining in public catering facilities to reduce over-preparation at home	9
Improve food supply management in public institutions (hospitals, nursing homes, schools) to reduce plate waste	5

A considerable number of respondents (52) reported having no specific proposals, which may indicate limited awareness or engagement with the issue. The most frequent suggestion was increased public education: 36 respondents emphasized the need for more frequent dissemination of information in the media, local press, and online platforms, as well as the publication of food waste statistics on municipal websites. Furthermore, 18 respondents stressed the importance of starting food waste education early in kindergartens and schools to foster responsible consumption habits from a young age.

Other proposals focused on practical measures: 20 respondents suggested setting up food-sharing stations where surplus or soon-to-expire items could be left, and 16 respondents argued that supermarkets should donate unsold food. Respondents also highlighted the need for more unpackaged or small-portion products, particularly for elderly or single-person households.

Beyond the survey results, additional recommendations can be drawn from FAO, the European Commission, and the Environmental Protection Agency (EPA). These suggest adopting an integrated framework for Tauragė County,

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consisting of four interrelated strategic directions: prevention, practical solutions, organic waste processing, and innovation (Figure 3).

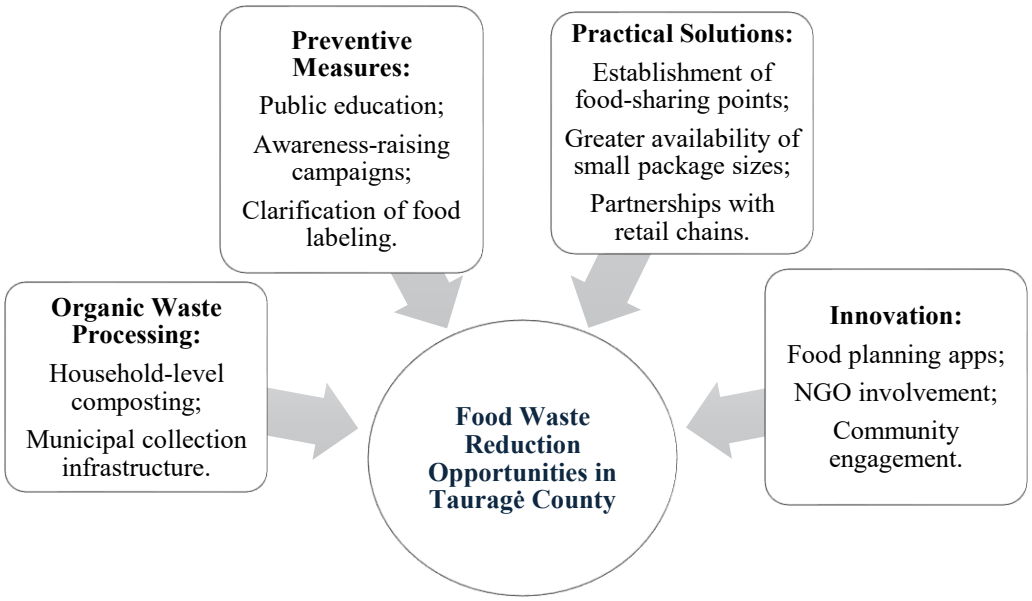

Figure 3. Conceptual framework for addressing food waste in Tauragė County

Prevention is the first line of action, with a strong emphasis on public awareness and education. Long-term campaigns, school programs, and community initiatives are recommended to strengthen consumer knowledge on labeling ("best before" vs. "use by") and food waste impacts.

Practical solutions include direct behavioral interventions, such as food-sharing points, broader availability of unpackaged products, and smaller packaging sizes. Collaboration between retailers and local authorities could enhance sustainability in this area.

Organic waste processing offers alternatives for unavoidable waste. Composting, both individual and collective, should be promoted through subsidies for compost bins, training sessions, and dedicated containers.

Innovation encompasses technological and community-driven solutions, such as mobile applications for meal planning and expiration monitoring, as well as NGO-led food-sharing initiatives. Adaptation of such innovations to local contexts will be critical.

Finally, to assess the feasibility of implementing these measures in Tauragė County, external factors must be considered. A PEST analysis provides a structured approach for evaluating the political, economic, social, and technological conditions that may either facilitate or hinder the adoption of these strategies.

Conclusions

The literature review revealed that the largest share of food waste occurs within households, indicating that consumer behavior is a decisive factor. The analysis addressed different forms, causes, and practices of waste (e.g., lack of planning, misunderstanding of expiration dates), while also discussing the consequences of waste and international models of waste reduction strategies (e.g., circular economy, waste hierarchy).

The research methodology was based on theoretical study examples as well as the practical need to examine household-level food waste. The

questionnaire covered purchasing habits, food leftover management, the extent and causes of waste, and the assessment of reduction opportunities.

The empirical study revealed that food waste levels in Tauragė County remain high, despite many residents acknowledging the relevance of the issue. Over-purchasing, unplanned shopping, improper storage, and disregard for expiration dates were identified as the main causes. The findings also showed that residents tend to shift responsibility to retailers or systemic factors, while often avoiding changes in their own behavior. Among the most important recommendations were education, the establishment of food-sharing points, a clearer food labeling system, and raising awareness from an early age.

This study demonstrates that addressing household food waste necessitates integrated individual and systemic interventions, thereby providing an evidence-based foundation for policy development, community initiatives, and sustainable consumption strategies.

The study may serve as a valuable resource for policymakers, municipal authorities, and non-governmental organizations seeking to design evidence-based strategies for waste prevention. Moreover, it provides practical insights for educators, retailers, and community leaders aiming to foster behavioral change at the household level. By highlighting both barriers and opportunities, the research can inform targeted interventions, contribute to the development of sustainable consumption patterns, and support broader environmental and socio-economic policy goals.

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