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# Understanding household food waste behaviours in Jordan: ethnographic research

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## Abstract

**Purpose** – In Jordan, household food waste remains substantial despite limited research, data and policy interventions targeting its reduction. This study addresses the critical gap by exploring household behaviours towards food waste in the Jordanian context.

**Design/methodology/approach** – The study employed a qualitative research paradigm by approaching ethnographic research to gain a clearer picture of the household behaviours related to food waste practices and routines of everyday life in Jordan. This study was conducted with 20 households across West and East Amman by carrying out four main methods: a survey, ethnographic observation, photovoice and semistructured interviews.

**Findings** – The study identified key factors influencing household food waste behaviours in Jordan, including generosity, religious beliefs, socioeconomic disparities and deficient planning practices. Generosity, rooted in cultural norms of hospitality, often led to over-preparation and waste, while religious values promoted restraint and ethical food handling. Socioeconomic differences between West and East Amman shaped purchasing habits and storage practices, with wealthier households exhibiting more materialistic behaviours. Single-person households faced unique challenges, including oversized packaging and reliance on external dining. These insights highlight the interplay between cultural, economic and practical factors in shaping food waste behaviours, suggesting targeted, context-sensitive interventions.

**Research limitations/implications** – The study's findings are limited by the focus on urban areas of Amman, which may not fully represent broader Jordanian contexts, including rural regions. Reliance on self-reported data such as photovoice diaries and interviews introduces potential biases, including social desirability. The research predominantly examines cultural and socioeconomic drivers with less emphasis on environmental or policy-related factors. Future studies should include larger, more diverse samples, integrate objective data collection methods (e.g. waste audits) and explore the influence of governmental policies and infrastructure to provide a more holistic understanding of household food waste behaviours.

**Practical implications** – The study provides actionable insights for reducing household food waste in Jordan. It highlights the need for public awareness campaigns promoting sustainable hospitality practices that respect cultural norms while reducing waste. Design interventions, such as workshops on meal planning and portion estimation, can address over-preparation linked to generosity. Policies encouraging affordable, portion-sized packaging and supporting efficient food storage are essential, especially in lower-income areas. Religious and cultural values, such as moderation and ethical food redistribution, should be integrated into sustainability initiatives. These measures can mitigate food waste while aligning with local traditions and socioeconomic contexts to enhance effectiveness.

**Originality/value** – This study offers novel insights by introducing generosity as a cultural factor influencing household food waste in Jordan, a perspective largely unexplored in prior research. By examining the interplay between cultural norms, religious values and socioeconomic disparities, it enriches the understanding of food waste behaviours in a Middle Eastern context. The ethnographic approach, incorporating methods like photovoice and semi-structured interviews, provides a nuanced and participatory perspective. The findings



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emphasise the dual role of generosity in fostering hospitality and driving waste, offering valuable implications for culturally sensitive interventions to balance traditional practices with sustainable food consumption.

**Keywords** Food waste behaviour, Food practices and routine, Consumer behaviour, Ethnographic research, Household behaviour, Jordan

**Paper type** Research paper

## 1. Introduction

Food waste has become an increasing global concern across research, policy, and design due to combined environmental, economic, socio-ethical, and political impacts that arise from poor food practices and routines (Badeenezhad *et al.*, 2024; Patel *et al.*, 2021; Reynolds *et al.*, 2019). It has been estimated that approximately one-third of the edible parts of food produced for human consumption are wasted (FAO, 2015a, b). Environmental studies have proven that food waste is harmful to the environment (Mandal *et al.*, 2024; WRAP, 2020), contributing significantly to global warming as it generates large amounts of greenhouse gas emissions (FAO, 2015a, b). Furthermore, around USD 310 billions of food is wasted every year in the developing countries because of poor technology, storage choices, inadequate harvests, and poor farming conditions, causing significant financial burdens (UNEP, 2024).

Sustainable Development Goal 12.3, aiming to halve food losses and reduce per capita food waste by 2030, faces criticism for its insufficient ambition (UNEP, 2024). The global challenge of providing food for over 9.1 billion people by 2050 is compounded by issues of undernourishment for 800 million people and escalating food demand (Parfitt *et al.*, 2010). The lack of understanding of food consumption and waste patterns contributes to significant food waste, especially at the household level (Bain *et al.*, 2024; Reynolds *et al.*, 2019). According to the United Nation Environmental Programme UNEP (2024), households are the primary contributors to the overarching food waste generation in both developed and developing countries, ac-counting for the largest share of food waste across the food supply chain. Household food waste, stemming from practices like preparing excessive meals and buying more than needed, necessitates a deeper understanding to inform effective solutions and interventions (Ananda *et al.*, 2023; Sigala *et al.*, 2024).

Reducing food waste provides economic benefits, enhances social equity by increasing food availability for those in need, and promotes environmental sustainability by conserving resources. Previous studies on household food waste using the Theory of Planned Behaviour (TPB) and the Theory of Reasoned Action (TRA) demonstrated limited explanatory power, with models explaining only 70%–80% of variance (Akhter *et al.*, 2024; Jang and Cho, 2022; Oehman *et al.*, 2022). The complexity of food waste as a multidisciplinary issue suggests the necessity for further exploratory research to comprehensively understand food waste behaviour (Elimelech *et al.*, 2024; Mohamed Yusoff *et al.*, 2024).

From a Jordanian perspective, research on food waste is negligible and scarce with a lack of reliable data, sources, drivers, policies, interventions, and initiatives directed at reducing food waste. While it is estimated that one-third of the world's food production is wasted and never consumed, Jordan's food waste is between 50 and 65%, higher than the international average of 33.3% (Jordan GBC, 2018). The Hashemite Kingdom of Jordan is a low-middle-income developing country in the Arab world surrounded by countries with ongoing conflicts, including Palestine, Syria, and Iraq. Consequently, the suffering nations sought refuge in Jordan; as a result, Jordan was subjected to additional pressure to meet not only the needs of its citizens, but also the needs of more than three million refugees (Al-Soleiti *et al.*, 2021). This increased burden is attributed to the semi-desert topography, the limited natural resources, and the high dependency on food imports (Prieto, 2018).

Persistent instability in Jordan has driven an increase in poverty, with 15.7% of the population living below the national poverty line, and a third experiencing transient poverty (WFP, 2020). Approximately 0.5% of the population faces food insecurity, and 13% are at risk, making them susceptible to malnutrition (FAO *et al.*, 2019). Consequently, addressing food

waste becomes crucial for establishing a sustainable food system and ensuring food security in the country (Abiad and Meho, 2018). Jordan lacks a solid waste management policy, contributing to municipal waste generation exceeding 2 million tonnes annually, most of which is deposited in unsanitary landfills, leading to substantial greenhouse gas emissions with a global warming potential 25 times greater than carbon dioxide (Abiad and Meho, 2018; Jordan GBC, 2018). Jordan is among the top 25 countries globally for food waste, generating an estimated 210 kilograms per person annually (Abiad and Meho, 2018). Despite the substantial food waste at the household level in Jordan (Khader *et al.*, 2019), it is imperative to comprehend the underlying reasons and influencing factors behind this behaviour (Abdelradi, 2018; Abiad and Meho, 2018; Adel *et al.*, 2024).

The food waste issue in Jordan is critical due to its serious environmental and economic consequences, as well as because it directly impacts food security and the country's ability to provide for its population. With a growing population, including a large refugee influx, food systems in Jordan face increasing pressure (Al-Soleiti *et al.*, 2021). The challenge is further exacerbated by a lack of national policies or systematic waste management frameworks addressing food waste (AlMuheisen, 2021). While food waste contributes to greenhouse gas emissions and landfills, it also leads to the squandering of valuable resources such as water and energy used in food production, transportation, and disposal (Chaher *et al.*, 2024). Furthermore, given the socio-economic disparity in Jordan, where 15.7% of the population lives below the poverty line, food waste represents a loss of valuable resources and highlights issues of equity and access (World Food Programme, 2020). Wasting food in a country with high levels of food insecurity, where one in ten people is at risk of malnutrition, compounds the urgency to reduce food waste as part of a broader effort to promote sustainability and social justice (FAO, 2022).

This study addresses notable gaps in the existing knowledge base. First, there is a dearth of research on food waste in Jordan, marked by insufficient and scarce data, limited sources, and an absence of comprehensive insights into drivers, policies, interventions, and initiatives aimed at mitigating food waste. Moreover, the factors influencing food waste behaviour in the Jordanian context remain unidentified. The second gap pertains to the application of behaviour change theories in comprehending food waste behaviour, warranting further investigation. The theoretical frameworks used in these studies are predominantly based on quantitative exploration. Recognising these gaps, two key research questions guide this inquiry: *What are the primary factors influencing food waste behaviour at the household level in Jordan? and What are the key differences in food waste practices between households in West and East Amman, and how do these reflect broader socio-economic and cultural divides in Jordan?* This study provides a comprehensive understanding of the ethnographic research conducted to gain a clearer picture of the household behaviours related to food waste practices and routines of everyday life in Jordan.

A unique aspect of this study is its focus on generosity as a key influencing factor in food waste behaviour. Generosity, deeply rooted in cultural and social values, often manifests in food-related practices, especially in hospitality-driven societies. In Jordan and other Arab cultures, generosity is frequently expressed through the preparation of abundant food for guests. This social norm, although driven by goodwill, often leads to excessive food preparation, as hosts seek to demonstrate care, respect, and social status. As Baig *et al.* (2019a) and Capone and Youssfi (2015) have noted, over-preparation of meals is considered a sign of hospitality and social standing. However, it inadvertently results in food surplus, much of which ends up being discarded.

From a theoretical standpoint, generosity contributes to food waste in two primary ways. First, the cultural imperative to serve large quantities of food, particularly during gatherings and celebrations, leads to the over-purchasing and over-preparation of meals (Mateus *et al.*, 2024). This is consistent with the findings of Richter and Bokelmann (2018), who argue that acts of generosity are closely tied to social expectations, driving hosts to prepare more food than necessary to ensure guests are well-provided for. Second, leftover food is often discarded

due to concerns over its freshness or a reluctance to serve it again, as it is perceived to reduce the host's perceived generosity and care for guests (Capone and Youssfi, 2015).

The theoretical lens of generosity as an influencing factor on food waste offers a deeper understanding of how cultural values intersect with sustainable practices. While generosity enhances social relationships and reflects community bonds, it also plays a significant role in increasing food waste. By addressing this dynamic, this study provides a fresh perspective on the cultural drivers of food waste and offers insights into how traditional values can be balanced with sustainable consumption practices.

This paper is structured as follows: the first section describes of the data collection procedures and method of analysis. Next, the main results of the ethnographic research are reported, and the following section discusses the factors that appear to influence household food waste behaviours in Jordan in more detail. Finally, the last section presents the conclusions and research limitations.

## 2. Methods

### *2.1 Data collection*

This study utilised a qualitative, ethnographic research design to explore food waste behaviours in Jordanian households, chosen for its depth in capturing culturally nuanced practices and beliefs. Given the limited existing knowledge on this topic within Jordan, an exploratory approach was appropriate (Lata Sharma and Sarkar, 2019). Ethnography allowed for close observation and documentation of the subtle, daily routines contributing to food waste, using participant observation, open-ended questionnaires, photovoice, and semi-structured interviews (Figure 1). This helped to build a multi-dimensional understanding of these behaviours (Creswell and Creswell, 2018).

Data collection involved three meetings with participants. Before conducting this study, the first author obtained ethical approval from Brunel Research Ethics. The first meeting introduced the study and clarified any questions, establishing a collaborative tone. During this session, the first author conducted face-to-face questionnaires, targeting varied household types, including single and multi-person households. These questionnaires combined closed-ended demographic questions with open-ended prompts to explore food consumption and waste themes, offering initial insights into participants' behaviours. Participants were also introduced to the observation phase and received instructions for a photovoice assignment, where they captured 12–24 photographs depicting moments of food waste. Each participant received a photovoice diary notebook with space allocated for 18 days of notes, allowing them to document thoughts on each image. Emphasis was placed on photographing food items rather than packaging, ensuring consistency across entries.

Following this introductory meeting, ethnographic observation was conducted using a checklist developed per Robson's (2011) guidelines, allowing for objective tracking of food-related activities such as planning purchases, storage, cooking, and managing leftovers. This checklist was designed to minimise observer inference while allowing efficient data capture using tick boxes (Jerolmack and Khan, 2018). This method enabled a structured documentation of the routines influencing food waste in each household.

The photovoice method added a reflective layer to the data, allowing participants in West and East Amman to document their food waste experiences. This approach empowered participants to control their narratives, encouraging active reflection on household food waste. Particularly valuable in ethnographic studies, photovoice captures subjective interpretations that complement visual data (Wang and Burris, 1997). Participants photographed instances of waste over a two-week period and recorded related notes in their diaries, which were later discussed during interviews (Figure 2). WhatsApp reminders kept participants engaged and ensured continuity in data collection.

The final data collection phase involved online semi-structured interviews guided by Wang's (1999) SHOWed acronym. These interviews used participants' photos as discussion

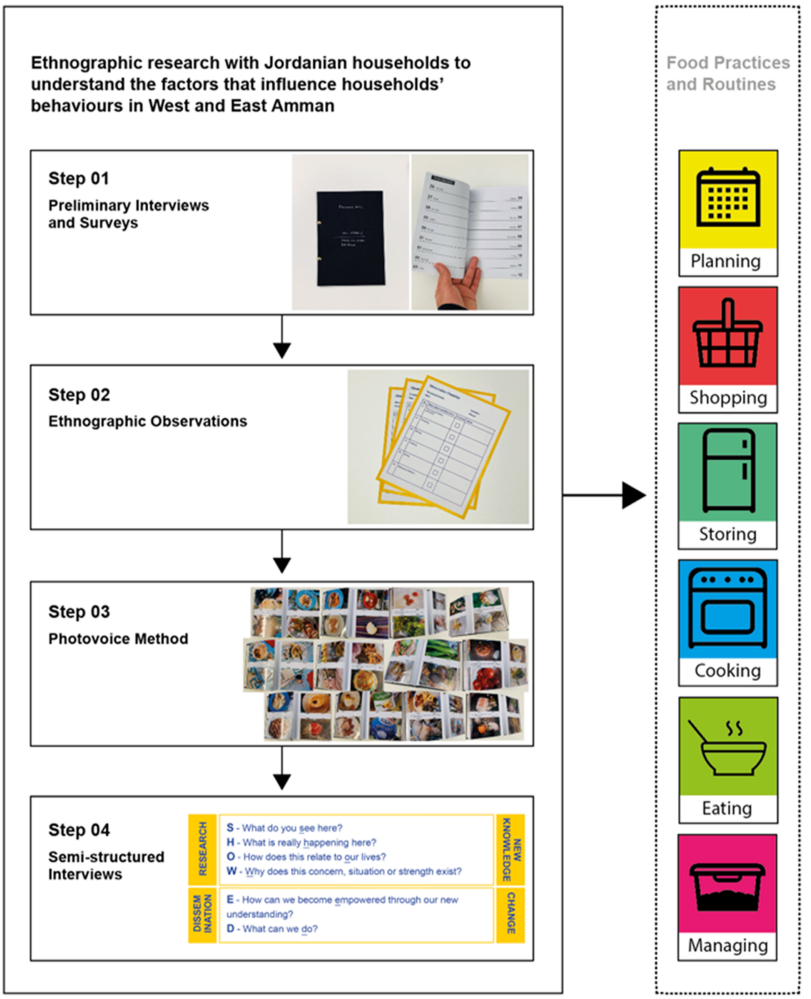


**Figure 1.** Linkage between data collection methods and food practices and routines. Source: The authors

points and moved from descriptive to analytical questions, facilitating deeper reflection on food waste practices. Key prompts included: "What do you see here?", "What is happening?", "How does this relate to our lives?", "Why does this situation exist?", and "What can we do about it?" These questions helped contextualise behaviours within broader socio-cultural and economic frameworks.

The combined methods effectively addressed the study's core research questions, examining both the factors influencing household-level food waste and the variations between households in West and East Amman. By engaging participants in multiple data collection methods, the study allowed for a comparative analysis that highlights how socio-economic and cultural divides in Jordan influence food waste practices. Together, these methods increased the validity and depth of the findings, offering an in-depth perspective on household food waste within Amman's socio-cultural landscape.

**Figure 2.** Part of the collected photos. Source: The authors

*2.2 Participants*

Participants were selected from West and East Amman to represent a diverse socio-economic and cultural mix within Jordan's urban setting. The sample included 20 households spanning different household types—single-person households, single-parent families, couples without children, and couples with children—to capture the influence of household composition on food waste practices. This approach enhanced the representativeness of the study.

A quota sampling method was used to ensure a balanced cross-section of Amman's population, facilitated by the first author's personal network, and focusing on individuals willing to discuss household food waste practices in detail. Initial recruitment was conducted via email and WhatsApp, followed by referrals from participants, resulting in a diverse sample particularly open to reflective discussion on food habits, consistent with Elliott *et al*. (2012).

Eligibility criteria required participants to reside in urban Amman (West or East areas) and be aged 20–70 years, covering a range of household management experience. This criterion ensured relevance to food waste behaviours and captured gender balance by including both male and female participants. Selecting West and East Amman provided a socio-economic and cultural contrast, with West Amman generally being more affluent and modern, and East Amman being more traditional and lower-income. This regional distinction allowed the study to examine how socio-economic diversity affects food waste, with findings that may apply to similar contexts in Jordan. Participant characteristics are summarised in Table 1.

*2.3 Data analysis*

The data analysis process systematically managed multiple qualitative data sources, including open-ended questionnaire responses, photographs, field notes, audio recordings from observation visits, photovoice diary entries, and transcribed interviews. Data were organised and transcribed, with Arabic responses carefully translated into English to ensure contextual accuracy, in line with best practices for cross-language qualitative research (Egilsson *et al*., 2022). Following transcription and translation, the data were imported into NVivo 12 software for thematic analysis. The authors conducted a deductive thematic analysis

**Table 1.** Description of households in West and East Amman

| Participant no. | Gender | Age | Household size | Group | Location |
|---|---|---|---|---|---|
| P1 | F | 36 | 5 | Couple with children | West Amman |
| P2 | M | 39 | 5 | Couple with children | West Amman |
| P3 | F | 43 | 7 | Couple with children | West Amman |
| P4 | F | 33 | 5 | Couple with children | West Amman |
| P5 | F | 30 | 2 | Couple without children | West Amman |
| P6 | M | 27 | 2 | Couple without children | West Amman |
| P7 | F | 49 | 4 | Single-parent household | West Amman |
| P8 | M | 56 | 3 | Single-parent household | West Amman |
| P9 | M | 25 | 1 | Single-person household | West Amman |
| P10 | F | 22 | 1 | Single-person household | West Amman |
| P11 | F | 39 | 7 | Couple with children | East Amman |
| P12 | F | 42 | 7 | Couple with children | East Amman |
| P13 | F | 39 | 5 | Couple with children | East Amman |
| P14 | F | 39 | 5 | Couple with children | East Amman |
| P15 | M | 25 | 2 | Couple without children | East Amman |
| P16 | M | 27 | 2 | Couple without children | East Amman |
| P17 | F | 36 | 3 | Single-parent household | East Amman |
| P18 | F | 48 | 4 | Single-parent household | East Amman |
| P19 | F | 67 | 1 | Single-person household | East Amman |
| P20 | M | 22 | 1 | Single-person household | East Amman |

**Source(s):** The authors

following Braun and Clarke (2021) approach. A set of predetermined codes, drawn from the literature on food waste behaviours, guided the deductive coding process, allowing for a focused examination of behaviours and motivations central to the study's research questions. Initial codes covered anticipated themes, such as purchasing habits, storage practices, cultural beliefs, and socio-economic factors, and were refined to reduce redundancy in line with best practices in qualitative coding (Miles *et al.*, 2020; Nowell *et al.*, 2017).

The coding procedure followed three primary phases: open coding, axial coding, and selective coding. During open coding, each data segment was examined and assigned preliminary labels that captured initial insights into food waste behaviours. This phase allowed for flexibility and enabled to document emerging concepts as they appeared in the data. Next, axial coding was conducted to group these initial codes into broader categories and identify relationships among them. This step facilitated the organisation of codes into higher-order themes by identifying patterns related to food waste practices, such as meal planning, storage methods, and leftover management. Axial coding provided a more structured view of how various codes connected, creating a cohesive foundation for thematic categorisation. Finally, selective coding identified core themes by integrating and refining the major thematic categories. Overlapping themes were merged where relevant, and unique themes were retained independently to preserve the integrity of distinct findings. Selective coding synthesised the data into meaningful thematic insights, allowing exploration of the relationships among the major themes and sub-themes. Throughout coding, the "constant comparison" method (Glaser and Strauss, 2009) was employed, whereby new data were continually compared with previously coded data to ensure consistency and enable ongoing refinement. The organised and refined coded data were stored in NVivo 12, where thematic nodes and hierarchies were further developed, supporting the construction of a structured thematic narrative that explored socio-economic and cultural influences on food waste practices in Amman. Following coding, themes were iteratively reviewed and refined to enhance the validity of the thematic structure, a step that is essential for establishing credibility in qualitative research (Creswell and Creswell, 2018). Themes were then consolidated into a smaller set of core categories for

clearer interpretation, in line with thematic network analysis guidelines (Braun and Clarke, 2021).The final interpretative stage involved selecting themes for a qualitative narrative, contextualising findings within existing literature and the authors' insights. This narrative approach provided in-depth insights into how food waste behaviours differ across households in West and East Amman, highlighting the socio-economic and cultural factors that shape these behaviours (Nowell *et al.*, 2017). Quotations were labelled by household group and location (Table 1) to preserve context while maintaining participant confidentiality, in accordance with ethical research standards (Kaiser, 2009; Surmiak, 2020).

## 3. Results

### *3.1 Household practices and planning deficiencies*

Across all household groups, deficiencies in planning and purchasing routines were evident. Couples with children and couples without children were found to rely on incomplete shopping lists or verbal reminders, often omitting quantities and neglecting to coordinate meal plans. This led to over-purchasing, particularly of perishable items like vegetables and fruits. For example, one participant explained, ". . . sometimes we make spontaneous purchases that happen without much contemplation, for instance, buying good appearance non-seasonal fruits or vegetables that end in the bin" (P4). Another added, "We often forget what we already have at home, so we double up, especially with fruits, greens, and dairy" (P13), highlighting the disconnection between shopping habits and actual household needs. Single-parent households struggled to manage time, often shopping late at night for discounted items, which sometimes led to impulse purchases. One parent shared, "I usually go shopping after putting the kids to bed, and by then I'm exhausted. I just grab whatever is cheap and seems useful, but I don't always use it" (P17). Single-person households, particularly in West Amman, faced unique challenges with purchasing quantities suited to their needs, as one participant noted, "I find it more challenging to buy and prepare food due to larger package sizes of the food product" (P10).

### *3.2 Storage and preservation challenges*

Improper storage practices were reported across all groups. Couples with children frequently stored new and old food items together, leading to spoilage, as revealed through photovoice and surveys. For instance, one participant remarked, "I forget to check the expiry date before purchasing the dairy products, so I found the expiry dates have passed and therefore discard the products" (P3). Another participant noted, "We don't really have a system. Sometimes we push older stuff to the back of the fridge when we unpack new groceries, and then it just sits there until it's no good" (P6). Single-parent households often lacked the time to organise food properly. As one parent explained, "After work and helping the kids with homework, I just put things wherever there's space. Later, I realise I have doubles or spoiled food" (P8). While single-person households reported limited knowledge of optimal storage methods, as one participant shared: "I'm not sure how to best store some food to prolong shelf life but as you can see if I have a larger number of herbs, I bundle smaller batches individually to better control moisture levels" (P11). Another mentioned, "I didn't know onions and potatoes shouldn't be stored together. I thought I was saving space by keeping them in one drawer" (P14).

### *3.3 Cooking and serving habits*

Generosity played a significant role in food preparation among couples with children and couples without children, who often prepared more food than required for family meals or social gatherings. One participant noted, "My husband and I invited relatives for dinner; however, I cooked a varied and large amount of food, and I found a large number of spillages in their plates and on the tables which led to being thrown away" (P12). Another participant

shared, "Even on regular days, I cook as if we're expecting guests. It feels wrong to serve just enough, we always want to offer more than needed" (P16). This cultural emphasis on abundance often led to excessive quantities being prepared, much of which was ultimately discarded. One respondent remarked, "We believe that offering a lot of food shows care and respect, but sometimes the leftovers are too much to manage" (P5).Single-parent households faced challenges in portion control, leading to excessive leftovers. As one single parent explained, "It's hard to guess how much the kids will eat. Sometimes they're really hungry, sometimes not at all, so I just make more to be safe" (P18). Single-person households, particularly in West Amman, exhibited wasteful behaviours by relying on restaurant dining or ready-made meals, with little regard for portion sizes. One participant admitted, "I don't like cooking for one person, so I usually order in. But the portions are too big and I get tired of eating the same leftovers" (P9). These habits reflected a disconnect between convenience-based eating and effective food use, leading to higher levels of waste in this group.

### *3.4 Cultural and religious values*

The results revealed that religious beliefs had a strong and positive impact on food waste reduction behaviours across all households in the study. When asked about the main factors influencing their food waste reduction practices in the survey, all 20 participating households identified "Religious beliefs" as the most important factor. This was consistent across different household types and demonstrates the pivotal role that religion plays in shaping attitudes towards food waste.

Cultural and religious values were also important in shaping food waste practices, with cultural norms around generosity playing a particularly strong role. Couples with and without children, in particular, often prepared large quantities of food as part of their hospitality traditions, demonstrating the importance of showing generosity to guests. However, this cultural practice of abundance was balanced by religious teachings that discourage wastefulness. Observational data from the study revealed that uneaten bread was frequently donated or left in accessible places for others, such as the poor or those in need. All, but one, of the participants (P18) shared their perspective, saying:

> I believe that bread should never be wasted, as Islam teaches us to value sustenance and avoid waste. In Islam, we are reminded to be mindful of our resources, as we may one day be in need and regret wasting what we once had. This belief encourages us to either donate or repurpose uneaten bread, reflecting respect for food and a sense of responsibility towards others.

Interestingly, adherence to religious and cultural practices concerning food waste reduction was not uniform across all household types. Couples and families, especially those with children, exhibited a stronger commitment to these practices. Their consumption patterns were more likely to reflect shared values of generosity and care for others, both of which are rooted in religious and cultural teachings. In contrast, single-person households demonstrated a lower adherence to such practices, with food consumption being more individualistic. This often led to a lower awareness of, or a lesser concern for, the religious principles guiding food waste reduction.

Thus, while cultural and religious values generally contributed to a strong commitment to reducing food waste, the level of adherence was influenced by household composition with families more likely to follow these guidelines in their everyday food-related practices.

### *3.5 Environmental awareness and materialism*

Environmental awareness was evident but generally low across all groups. Couples with children were more likely to express guilt over waste but lacked actionable knowledge to address it. For instance, one participant noted, "To be honest, there is an inner conflict that revolves around finishing all food provided on our plates to reduce food waste, and avoiding eating too much to maintain a healthy, slim body" (P2). Another shared, "I feel bad when I

throw food away, especially when I think of others in need, but I don't know how to store or reuse leftovers properly" (P12). Materialistic consumption patterns were more pronounced among single-person households in West Amman, as one participant remarked, "... Unconsciously, I purchased some good-looking nonseasonal mangoes that happened without much contemplation and end in the bin" (P5). Single-parent households were more price-conscious but frequently succumbed to promotions. One participant shared, "I usually go for 'buy one get one free' deals, even when I don't really need the second item—it feels like a waste to skip the discount" (P17). While these households demonstrated stronger financial awareness, their purchasing decisions were often influenced by short-term savings rather than long-term consumption efficiency or environmental impact.

## 4. Discussion

### *4.1 Household dynamics and food waste behaviours*

(1) Couples with children

Couples with children face unique challenges related to unpredictable eating patterns and preferences, often resulting in over-preparation and leftovers. These findings align with Headey *et al*. (2024), who observed that variability in family eating habits increases the risk of food waste. Furthermore, the cultural emphasis on generosity during social gatherings, noted by Capone and Youssfi (2015), exacerbates these behaviours.

In addition to over-preparation, this group also reported poor food storage practices, such as mixing old and new food items and neglecting expiry dates. These habits often led to premature spoilage, particularly in perishable items. For example, one participant admitted forgetting to check expiry dates on dairy products, resulting in waste (P3). These findings echo Koivupuro *et al.* (2012), who link inadequate storage routines to increased household food waste. Comparable findings were reported by Farr-Wharton *et al.* (2014), who highlighted that poor organisation within family households' fridges and pantries often contributes to accidental food spoilage. Similarly, Stancu *et al.* (2016) found that families with children tend to have less structured food planning routines due to time constraints, resulting in higher waste levels. These international observations reinforce the need for targeted educational interventions. Specifically, storage organisation strategies (e.g. FIFO – first in, first out), labelling systems, and family-involved meal planning could be effective for this demographic.

(2) Couples without children

Couples without children exhibited similar food waste patterns, primarily due to their participation in social gatherings where cultural norms dictated abundant food preparation. This behaviour supports Baig *et al.* (2019a, b) findings, which linked Arab hospitality to over-preparation. Moreover, they also showed tendencies to neglect proper storage practices, particularly when restocking groceries. One participant noted pushing older items to the back of the fridge when unpacking new groceries, leading to forgotten items and eventual spoilage (P6). These behaviours suggest that improving awareness of simple organisational strategies could complement efforts aimed at reducing over-preparation.

These behaviours mirror those observed by Aschemann-Witzel *et al.* (2015), who identified that in smaller households with higher disposable incomes and fewer dependents, waste often stems from convenience-driven habits and limited storage discipline. Furthermore, Stefan *et al.* (2013) found that adult-only households were less likely to plan their shopping and more prone to impulse buying, contributing to unmonitored food accumulation and spoilage. Together, these findings highlight the importance of integrating practical storage and shopping behaviour components into intervention campaigns targeting this demographic.

(3) Single-parent households

Time constraints emerged as a significant factor for single-parent households, leading to rushed shopping and minimal meal planning. This aligns with Tsalis *et al*. (2024), who highlighted the link between time pressures and unsustainable shopping practices. Their limited time also influenced how food was stored and cooked. As one participant explained, after work and parenting duties, items were placed wherever space allowed, resulting in spoilage due to duplication or lack of visibility (P8). Additionally, cooking practices leaned toward overproduction as a way to reduce daily meal prep, which often created more leftovers than the household could consume.

Secondi *et al.* (2015) found that single-parent families tend to fall into high-waste categories due to less predictable schedules, supporting the need for context-specific interventions. Time-saving tools, pre-prepared meal kits, and storage-friendly packaging might reduce waste without adding to the household's time burden.

(4) Single-person households

Single-person households faced distinct challenges, including oversized packaging and reliance on external dining options, which often led to waste. These findings echo Deliberador *et al*. (2023), who identified packaging size as a disproportionate barrier for smaller households. Policy changes encouraging the availability of portion-sized products could address these issues. Storage and food handling knowledge also posed challenges. For example, one participant was unaware that storing onions and potatoes together could cause faster spoilage (P14), while another tried to portion herbs to control moisture without being sure of best practices (P11). These cases highlight knowledge gaps that could be addressed through targeted educational content—such as visual guides or mobile-based tips—tailored for individuals living alone.

Moreover, many single-person households, particularly in West Amman, reported heavy reliance on ready-made meals and restaurant dining. One participant mentioned, "I don't like cooking for one person … I get tired of eating the same leftovers" (P9). This reflects a disconnection between convenience-driven lifestyles and sustainable food use. Campaigns promoting batch cooking with proper freezing techniques or meal-sharing platforms could reduce waste while maintaining convenience.

### *4.2 Generosity and religious beliefs*

Generosity, while culturally significant, consistently contributed to food waste across household types, particularly during social events. The findings from this study align closely with previous research, such as Abdelradi (2018) study on household food waste behaviour in Egypt, which found that religious beliefs significantly bolster environmental ethics towards preventing food waste. Similarly, Aschemann-Witzel *et al.* (2015) identified religion as a critical motivator in encouraging food waste prevention. These findings resonate within the Jordanian context, where the predominant religions are Islam and Christianity discourage food waste through cultural and religious teachings.

In Jordan, where Islam and Christianity represent the majority of the population (over 92 and 6%, respectively) (Ebniya, 2020), both faiths provide clear guidance on moderation in consumption. Islamic teachings, for instance, advocate for restraint, as highlighted in Quranic verses (Chapter 7:31) and the teachings of the Prophet Muhammad (PBUH), such as the Hadith:

> Nothing is worse than a person who fills his stomach. It should be enough for the son of Adam to have a few bites to satisfy his hunger. If he wishes more, it should be: One-third for his food, one-third for his liquids, and one-third for his breath. (Sunan Ibn Majah, Book 29, Hadith 3349).

Similarly, Christian teachings, such as those found in Holy Bible [1], (Proverbs 23:20–21), discourage wastefulness and gluttony, stating:

> Do not join those who drink too much wine or gorge themselves on meat, for drunkards and gluttons become poor, and drowsiness clothes them in rags.

These religious principles influence individual food consumption behaviours and shape broader societal attitudes toward waste. They emphasise moderation and ethical consumption, both of which align with sustainability goals. The study findings reveal that such religious teachings played a significant role in reducing food waste across Ammani households, especially in practices surrounding bread. Bread, as noted in the data, is often seen as sacred, and families adhere to cultural practices that prioritise its reuse or donation rather than discarding it. This behaviour echoes Abdelradi's (2018) observations, where bread was not wasted but repurposed or donated to those in need, or used as livestock feed.

The cultural tradition of generosity, particularly in the form of abundant food offerings to guests during social events, is a key driver of food waste in Jordanian households. However, this generosity is tempered by religious principles that encourage moderation and the ethical treatment of food. While cultural norms push individuals to prepare more food than necessary, religious teachings help mitigate this tendency by encouraging food redistribution, particularly when food, like bread, cannot be consumed. This finding reflects the work of Mateus *et al.* (2024), who highlighted the tension between cultural hospitality and sustainable practices. The cultural emphasis on honouring guests with abundant meals can sometimes lead to food surplus and waste, but religious teachings provide a framework that encourages responsible consumption and redistribution.

This interplay between generosity and religious beliefs suggests that integrating these values into sustainability campaigns could be a potent strategy for encouraging more sustainable food consumption. By aligning environmental goals with deeply held cultural and religious ethics, such campaigns could bridge traditional hospitality practices with modern environmental concerns. For instance, promoting the Islamic and Christian values of moderation and ethical consumption could help inspire sustainable behaviours while respecting cultural traditions.

However, the study also reveals that single-person households face unique challenges in adhering to both cultural and religious principles regarding food waste. These households often exhibit more individualistic consumption patterns, which may lead to less awareness or adherence to religious guidelines on waste reduction.

Finally, this study highlights the dual role of generosity and religious beliefs in shaping food waste behaviours. While cultural hospitality practices may contribute to food waste in certain contexts, religious teachings provide a counterbalance by promoting responsible consumption and the ethical treatment of food. Together, these values offer a powerful pathway to promoting sustainable food consumption, providing a deeper understanding of how cultural and religious frameworks can support modern environmental goals.

### *4.3 Environmental awareness and socio-economic influences*

This study confirms that materialistic consumption and impulsive buying, especially among single-person households in West Amman, are key drivers of food waste. Participants described purchasing items based on appearance or promotions without considering actual need, reflecting the aesthetic-driven and promotional purchasing behaviours identified by Farr-Wharton *et al.* (2014) and Graham-Rowe *et al.* (2015).

The conflict between sustainability intentions and actions echoes Stancu *et al.* (2016), who highlighted cognitive dissonance in consumers trying to balance waste reduction with habitual behaviours. This was evident in participant reflections like buying "good-looking mangoes" or falling for "buy one get one free" deals.

Compared to East Amman, West Amman's higher-income households displayed greater value-action gaps, a trend also noted by Aschemann-Witzel *et al.* (2015). In contrast, lower-income households may waste less due to financial pressure but still face challenges related to time, planning, and storage—findings supported by Secondi *et al.* (2015).

## 5. Theoretical and practical implications

This study makes several contributions to the theoretical understanding and practical management of food waste behaviours in contexts characterised by distinct cultural and socio-economic dynamics in Jordan.

From a theoretical perspective, the introduction of generosity as a factor in household food waste expands the literature on behavioural drivers. Unlike conventional factors such as economic constraints or environmental awareness, generosity is deeply embedded in Jordanian cultural and social norms. The study demonstrates how acts of hospitality, while strengthening social bonds, inadvertently encourage over-purchasing and excessive preparation of food. This new lens provides a framework for analysing food waste within other cultures where hospitality plays a central role and offers opportunities for comparative research. Furthermore, the integration of religious beliefs into behavioural analyses highlights the interplay between spiritual values and sustainable practices, enriching existing models like Ajzen's (1991) Theory of Planned Behaviour (TPB). Furthermore, the inclusion of visual methodologies like photovoice demonstrates the potential of participatory approaches in capturing nuanced household practices. This methodological innovation can be replicated in similar studies to enhance community engagement and ensure that solutions resonate with local experiences.

On a practical level, the findings offer actionable insights for policymakers, community leaders, and organisations striving to reduce food waste in Jordan. Given the interplay between cultural norms, socio-economic conditions, and food waste behaviours, interventions must be tailored to address specific household challenges while respecting local traditions. First, educational initiatives should target storage and preservation challenges, which were commonly observed across household types. Awareness campaigns could teach families proper storage techniques, such as using airtight containers, first-in, first-out (FIFO) strategies, and refrigeration best practices to extend food shelf life. This would be particularly beneficial for single-person households and single-parent families, who often struggle with food management due to limited time or knowledge.

Second, interventions should recognise the regional differences between West and East Amman. In West Amman, where impulsive buying and materialistic consumption contribute to food waste, targeted campaigns should focus on promoting mindful purchasing, portion control, and responsible food consumption. Conversely, in East Amman, where financial constraints shape food waste behaviours, initiatives should emphasise cost-effective storage methods, meal planning, and community-driven food redistribution programs to reduce waste while enhancing food security.

Third, given the study's findings on generosity as a key driver of food waste, interventions should integrate religious and cultural values into awareness campaigns. Since religious teachings already play a role in shaping food consumption behaviours, campaigns could reinforce messages on moderation, ethical consumption, and the redistribution of surplus food in alignment with Islamic and Christian teachings. For instance, encouraging structured donation programmes and food-sharing initiatives could help mitigate waste while preserving the cultural value of hospitality. Furthermore, policy-level changes could support waste reduction by encouraging businesses to offer smaller portion sizes and flexible packaging to accommodate single-person households, who often struggle with oversized food packages leading to waste. Finally, community-led initiatives, such as neighbourhood food-sharing platforms, could further facilitate the redistribution of surplus food in less affluent areas.

## 6. Limitations and future research

Qualitative research cannot be generalised due to the small sample use; therefore, the study's findings should be viewed as exploratory rather than confirmatory. One notable limitation is the sample size and geographic scope. Thus, with 20 households selected from West and East

Amman, the findings may not fully represent the broader Jordanian population, particularly rural areas or other urban regions with distinct socio-economic and cultural dynamics. Future research could expand the sample to include a more diverse range of participants, capturing variations across different governorates and demographic groups.

Another limitation lies in the reliance on self-reported data, such as photovoice diaries and interviews, which may be subject to social desirability bias. Participants might have underreported wasteful behaviours or overemphasised adherence to cultural and religious norms. Combining self-reported methods with objective measurements, such as waste audits or direct observation of food waste quantities, could provide a more comprehensive understanding of household practices.

Moreover, the study focuses predominantly on cultural and socio-economic factors influencing food waste, with less emphasis on environmental or policy-driven determinants. Future research could explore the role of governmental regulations, economic incentives, and public infrastructure (e.g. waste management systems) in shaping household behaviours. Examining how these external factors interact with individual and cultural drivers could yield more holistic insights.

While the study identifies generosity as a novel determinant of food waste, the findings are context-specific to Jordan and similar cultures. Future studies could test the applicability of this concept in other cultural settings, potentially broadening its relevance and theoretical significance. Furthermore, longitudinal studies tracking changes in behaviour over time in response to interventions would be valuable in assessing the long-term efficacy of strategies aimed at reducing food waste.

## 7. Conclusion

This study has provided an exploration of household food waste behaviours in Jordan, uncovering the socio-cultural and economic factors that shape these practices. Through a combination of ethnographic methods, including surveys, observations, photovoice, and semi-structured interviews, the research offers novel insights into how cultural norms, such as generosity and religious values, influence food consumption and waste. These findings contribute to the existing literature by identifying generosity as a unique determinant highlighting the tension between cultural practices and sustainability goals.

The results also demonstrate the role of socio-economic disparities in shaping waste behaviours, with notable differences between households in West and East Amman. Factors such as purchasing habits, storage practices, and environmental awareness were found to vary significantly, reflecting the broader social and economic divides within Jordan. The study thus emphasises the importance of context-specific interventions that address these disparities while respecting cultural values.

From a practical perspective, the research provides actionable recommendations for reducing household food waste, such as promoting sustainable hospitality practices, improving public awareness, and developing interventions in regional socio-economic contexts. These strategies, if effectively implemented, have the potential to mitigate food waste while preserving the cultural significance of generosity and hospitality.

While the study has made meaningful contributions, it also acknowledges its limitations, including the sample size and geographic focus, as well as the reliance on self-reported data. Future research is encouraged to address these gaps by expanding the scope to include more diverse populations, incorporating objective measurements, and exploring the impact of policy and infrastructure on household food waste.

Lastly, this study highlights the urgent need to balance cultural traditions with sustainability imperatives, offering a pathway for reducing food waste in Jordan and similar settings. By raising greater awareness and implementing targeted interventions, it is possible to create a more sustainable food system that aligns with both cultural values and environmental priorities.

**Notes**

1. International version – Proverbs.

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