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Analysis of food waste behavior among managers, employees, and consumers at Warung Tegal in 2025

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ABSTRACT

Background and purpose: In Indonesia, food waste is an urgent problem, especially in the informal food sector, such as Warung Tegal or food stall, which has received insufficient attention in waste-reduction initiatives. Despite its high prevalence, research on food waste behavior in this sector remains limited, creating a gap in understanding of how managers, employees, and consumers influence waste generation. This study aims to explore behavior of managers, employees and consumers of Warung Tegal.

Methods: This study uses a qualitative phenomenological design with thematic analysis, based on in-depth interviews and field observations with 12 informants, including managers, employees, consumers from three Warung Tegal outlets, as well as environmental activists (FoodCycle Indonesia), the South Jakarta Environment Agency, and A Garbage Collector.

Results: The findings suggest that food waste may be influenced by a variety of behavioral factors. It was observed that one in three Warung Tegal had implemented waste sorting, though government support for food waste management was considered inadequate. In addition, awareness programs regarding food waste management have yet to be directed towards Warung Tegal business owners and waste management officers, who play a crucial role in this cycle.

Conclusion: Behavioral analysis of the informants indicates that food waste is influenced by various factors, including community access to waste management facilities and support initiatives tailored to the Warung Tegal sector. These findings highlight that Warung Tegal business operators could benefit significantly from support from the government and environmental organizations to raise awareness about the risks of food waste and mitigate this critical issue.

Keywords: food waste, behavior, waste management, Warung Tegal

INTRODUCTION

Food waste is a global issue that impacts the environment, society, economy, and public health. According to the United Nations Environment Programme (UNEP), an estimated 1.05 billion tons of food waste is generated annually across the retail, food service, and household sectors [1]. Indonesia ranks third in Southeast Asia for food waste production, generating 14,728,364 tons per year [1]. The Special Capital Region of Jakarta, and specifically South Jakarta, represents a critical epicentre of this issue [2]. South Jakarta ranks as the third-largest producer of municipal waste in the province, generating roughly 725,690.82 tons of waste per year [2].

As urban migration accelerates and consumption patterns shift, managing the massive volume of organic waste generated in these administrative districts has become an urgent municipal priority. Global food waste accounts for approximately 8% to 10% of total greenhouse gas emissions, directly accelerating global climate change [3]. When organic waste is discarded into unmanaged or overcrowded landfills, it undergoes anaerobic decomposition, releasing vast quantities of methane gas—a potent greenhouse gas with a global warming potential significantly higher than carbon dioxide [3].

Beyond long-term climatic disruption, the localized environmental degradation caused by decomposing food waste poses immediate hazards to human health. As organic materials break down in municipal landfills and open dumpsites, they produce hazardous chemical compounds, including hydrogen sulphide, ammonia, and various volatile organic compounds (VOCs) [3]. Prolonged atmospheric exposure to these emissions can severely disrupt the human respiratory system, irritate the eyes and skin, and cause damage to the central nervous system [3]. Furthermore, long-term exposure to these toxic decomposition compounds carries potential carcinogenic risks for surrounding communities [3]. Therefore, food waste management is not only an environmental issue but also part of efforts to protect public health and build a resilient food system [4].

Addressing urban food waste effectively requires looking beyond centralized municipal waste collection to the micro-level dynamics of the local culinary industry, particularly its informal segments. In urban Indonesia, *Warung Tegal* (commonly known as *Warteg*) serves as a cornerstone of the informal culinary landscape. These informal and semi-formal food stalls provide affordable, ready-to-eat meals that sustain millions of urban workers daily, making them an essential component of local food accessibility and social security. However, the informal operational nature of *Warung Tegal* creates significant institutional blind spots regarding waste tracking and municipal management. Official government statistics provided by the Badan Pusat Statistik (BPS) record only 1,424 formal food stalls in South Jakarta [5]. This figure is underestimated to reflect the true density of informal food establishments operating throughout grassroots neighbourhoods [5].

The lack of reliable, consistent data hinders effective waste monitoring, strategic program planning, and accurate resource allocation for organic waste management in the informal sector. Because many informal establishments operate outside centralized registries, municipal waste management authorities struggle to design targeted organic collection schemes, estimate daily bio-waste outputs, or deploy adequate waste collection infrastructure in informal commercial areas. Consequently, significant quantities of food waste generated through preparation and unsold meals bypass official collection systems, entering mixed municipal trash streams or informal neighbourhood dumping grounds.

Warung Tegal has developed widely with varying ownership systems, ranging from individual to partnership, which can be distinguished by the business name and building color [6]. These differences in systems have implications for operational management, including in terms of raw material procurement planning, storage techniques, serving processes, and waste management [1]. *Warung Tegal* can generate 6,383 kg of food waste per year, with rice being the largest contributor (60%) [7]. Meanwhile, other research also notes that food waste management in *Warung Tegal* is not yet optimal, with food loss and food waste accounting for 10–12% of total food supplies [8]. This indicates opportunities for behavior-based interventions and more efficient management.

Field observations reveal that while *Warung Tegal* outlets rarely face inventory surpluses during sales periods, they lack standardized regulations during critical operational stages such as meal planning, ingredient preparation, and cooking. Decisions across both franchised and independent outlets rely heavily on short-term sales trends rather than structured waste management, largely due to limited risk awareness and a lack of institutional support. To address these structural gaps in the informal culinary sector, researchers adopt both the Theory of Planned Behavior (TPB) and Social Cognitive Theory (SCT) to evaluate the underlying factors shaping the actions of managers, employees, and consumers.

While TPB and SCT have predominantly been applied to household waste studies, combining them offers a comprehensive dual framework for informal food systems. TPB explains *why* individuals make specific food waste decisions by evaluating attitudes toward the behavior, subjective norms, and perceived behavioral control [9–11]. Concurrently, SCT demonstrates *how* personal, environmental, and behavioral factors interact [12]—emphasizing that enhancing staff competence [13], operational self-efficacy [14], and broader social norms [15] can directly reduce waste accumulation. Together, these theoretical models provide a holistic foundation for designing targeted strategies to foster sustainable food management practices within *Warung Tegal* establishments. This study aimed to explore the waste management among managers, employees and customers of *Warung Tegal* in Jakarta.

METHOD

This study uses a qualitative approach with a phenomenological design to understand the subjective meanings of the experiences of managers, employees, and consumers of *Warung Tegal* regarding food waste behavior. The phenomenological study design is used to explore direct experiences within a social and cultural context and to understand how informants interpret food waste activities in *Warung Tegal* operations.

This study underpinned by the Theory of Planned Behavior (TPB) and Social Cognitive Theory (SCT) to capture and interpret the food waste management behaviors of key stakeholders in *Warung Tegal* operations. Integrating TPB and SCT provides a dual theoretical framework: TPB captures individual decision-making mechanisms (attitudes, subjective norms, and perceived behavioral control), while SCT examines the reciprocal interaction between personal cognitive factors (knowledge and self-efficacy), actual behaviors, and environmental influences (institutional support, facilities, and social environment).

Data collection was conducted through in-depth interviews and field observations in April–May 2025 at *Warung Tegal* X, Y, and Z, in South Jakarta. In-depth-interviews were conducted with 12 research informants

selected through purposive sampling based on predefined inclusion criteria. The participants comprised nine internal stakeholders across three *Warung Tegal* establishments (X, Y, and Z)—specifically three managers, three employees, and three consumers—along with three external stakeholders: an environmental activist from FoodCycle Indonesia, a staff member from the Waste and Hazardous Waste Management Section of the South Jakarta Environment Agency, and a local garbage collector operating near the three target locations. Field observation is conducted during *Warung Tegal* activities, including grocery buying, preparation, inventory, serving, and consumption. The research instrument consisted of an interview guide containing open-ended and probing questions to elicit relevant information. Informed consent was sought from the participants before the interview was conducted.

Data analysis in this study was conducted using thematic analysis. Thematic analysis was conducted to elaborate on the views, opinions, knowledge, and experiences from in-depth interviews and field observations. The six stages of thematic analysis in a qualitative approach are understanding the data, generating initial codes, generating initial themes, reviewing themes, refining and defining theme names, and interpreting the data.

This study has obtained ethical approval from the Ethics Committee of the Faculty of Public Health, University of Indonesia (Number: Ket-70/UN2.F10.D11/ PPM.00.02/2025). The researcher maintains the confidentiality of informants' identities and only shares research results with relevant parties. All data is securely stored on protected personal devices.

RESULT

Twelve informants were interviewed (Table 1) including 6 main informants no 1-6 (managers and employees of *Warung Tegal*), 1 key informant no 7 (Advisory Staff of the Waste and Hazardous Waste Management Section in the South Jakarta Environment Agency), and 5 additional informants no 8-12 (3 *Warung Tegal* Consumers, 1 Garbage Collector, and 1 staff member of FoodCycle Indonesia).

Table 1. Characteristics of the Informants

No.	Age (year)	Gender	Education
1.	43	Male	Senior High School
2.	40	Male	Senior High School
3.	37	Female	Senior High School
4.	39	Male	Junior High School
5.	31	Male	Senior High School
6.	34	Female	Senior High School
7.	45	Male	Bachelor Degree
8.	35	Male	Senior High School
9.	30	Female	Bachelor Degree
10.	45	Male	Senior High School
11.	43	Male	Junior High School
12.	39	Female	Bachelor Degree

The ownership and operational structures of three *Warung Tegal* restaurants in Tebet, South Jakarta, each of which is managed through a partnership/franchise scheme (*Warung Tegal* X and Y) and family-based individual ownership (*Warung Tegal* Z). In the two-partner *Warung Tegal*, the owners act as providers of investment capital, while the managers hold full authority over daily management and shift scheduling (morning–afternoon, afternoon–evening) within a 24-hour operational framework. In contrast, at *Warung Tegal* Z, operational responsibilities are rotated among family members without a formal shift schedule, reflecting flexibility but also potential variability in work processes. Despite differing ownership structures, all three *Warung Tegal* emphasize their commitment to maintaining continuous service throughout the day by leveraging limited labor and informal coordination.

In terms of raw material management, all three *Warung Tegal* adopt a “daily stock” approach, where fresh ingredients are purchased every morning (around 4:00–5:00 AM) at the nearest wholesale market without relying on a standardized shopping list. Purchasing decisions are based on observations of the previous day's remaining stock, consumer demand estimates, and daily revenue realization, thereby minimizing potential material waste. Limited storage capacity typically occurs in only one refrigerator or freezer unit, which primarily holds supporting items like sausages or ice cubes, thereby forcing the cooking and sales process to be completed in a single daily cycle. The preparation process begins with cleaning and arranging vegetables, followed by processing side dishes that require more time (frying, boiling), and labeling the cooking sequence based on maturity levels, without any written operational standards.

A statement from one of the informants who manages a food stall stated that:

“If there are leftover vegetables, they are immediately thrown away. However, if food such as processed fish, chicken, or eggs is reprocessed, they only last for one day.”

In addition, on holidays, three *Warung Tegal* choose to reduce the amount of food they cook to prevent leftovers and reduce income losses.

“On holidays, we don't cook much.”

On the other hand, *Warung Tegal* customers tend to be conscious about choosing the food they want to eat and finish. This result is reinforced by a consumer's statement:

“I order food that I will definitely finish.”

Food is served from an “L”-shaped glass display case that faces the main road, making it easy for customers to choose visually. The daily menu offers 30 to 50 dishes, dominated by main courses, with variations of stir-fried vegetables, soups, and sambal. It's aligned with diverse consumer preferences: office workers at *Warung Tegal* X, residents and students at *Warung Tegal* Y, and field workers (couriers, online ride-hailing drivers) at *Warung Tegal* Z. Field observations show that almost no food is left on plates, indicating high consumption efficiency. However, waste management is still carried out conventionally: preparation waste (vegetable peels,

stems, protein scraps) and consumption waste (bones, leftover rice) are disposed of together in one container, then transported by community volunteers to the temporary waste disposal site every night. With an average waste production of 30 kg per day, this finding opens opportunities for further discussion on mechanisms to reduce food waste and optimize organic waste management.

In addition, the findings of this study reveal efforts to mitigate food waste at *Warung Tegal* X, Y, and Z through structured operational practices that are responsive to the dynamics of consumer demand and preferences. *Warung Tegal* X adapts its operations by asking customers whether they want a full or half portion of rice, while *Warung Tegal* Y and Z rely on customers to determine portion sizes, resulting in different levels of food waste among the three.

“So we ask the customer first, ‘Would you like one serving or half a serving?’”

All *Warung Tegal* practice reusing leftover side dishes by adding spices and herbs to maintain flavor, while vegetable leftovers are discarded after one day of sales, as they are deemed to reduce quality. On weekends (Saturday and Sunday), all three *Warung Tegal* reduce their menu variety from an average of 35-50 items to fewer than 35 items to align inventory with decreased visitor volume. Evaluating consumer consumption patterns, which tend to align portion sizes with initial intentions, helps managers design daily inventory based on preferences and revenue realization, thereby reducing food waste.

“On Saturdays and Sundays, we cook fewer than 35 dishes.”

“On Saturdays and Sundays, we don't cook too much.”

Although one *Warung Tegal* successfully separates wet and dry waste, the other two still mix all waste and hand over its transportation to sanitation workers, making the effectiveness of organic waste management a challenge that will be further examined in the sub-section on environmental factors.

The managers and employees of *Warung Tegal* X, Y, and Z demonstrate a high level of awareness of the consequences of food waste accumulation for the cleanliness and comfort of their operational environment, actively adopting initiatives such as adjusting rice portions and reprocessing leftover side dishes to minimize food waste, although their practices in organic waste sorting remain limited. They view the waste collection system that combines all types of waste as reducing the effectiveness of waste management, but they still accept this mechanism due to space and facility limitations and the obligation to pay fees to sanitation workers.

“Once separated, waste should not be mixed again during transport...”

“We instruct residents to separate their waste, but when it is collected, it is still mixed together.”

From the perspective of subjective norms, consumer support for the rice portion confirmation policy and

their tendency to finish the food they order provide social validation that strengthens the *Warung Tegal*'s efforts to reduce food waste. At the same time, reliance on external transportation services and concerns about odor and unsanitary conditions if waste management is conducted at the *Warung Tegal* location highlight environmental barriers and public perceptions that further limit the operators' ability to implement a more independent food waste management system.

“Limited space and the smell of garbage can reduce customers' interest in visiting our food stall.”

The three *Warung Tegal* X, Y, and Z actively develop behavioral control capacity through daily stock planning based on observations of the previous day's food waste, reprocessing side dishes with added seasoning to avoid waste, adjusting rice portions based on customer consumption patterns, and implementing a maximum of two cooking sessions per day if demand increases. They deliberately avoid long-term storage. All ingredients are purchased fresh every morning and cooked immediately, due to facility limitations and the belief that ingredient freshness affects taste.

“We must calculate our shopping carefully, and the cooking must also suit the consumers' tastes.”

“We strive to ensure that the food cooked today is finished according to our shopping estimates.”

In terms of knowledge, managers and staff understand the basic concepts of food waste and the implications of its accumulation for environmental cleanliness and health, including unpleasant odors and potential health hazards, but they lack information on advanced processing techniques such as organic waste sorting, composting, or food donation. Although government programs and community initiatives such as FoodCycle Indonesia provide digital access to waste management guidelines and maggot composting technology, outreach has not reached the *Warung Tegal* scale, so spatial constraints, double operational costs, and public perceptions about odor hinder the adoption of more advanced pro-environmental practices.

Overall, perceived behavioral control variables and knowledge levels underpin *Warung Tegal*'s daily operational decisions, which are deemed capable of creating effective stock and reprocessing routines. However, the long-term impact on reducing food waste still depends on improved access to information and support from the government and community. The managers and employees of *Warung Tegal* X, Y, and Z demonstrate high efficacy in minimizing food waste by adjusting ingredient purchase volumes and cooking patterns based on operational experience and consumer feedback.

The implementation of practices such as reprocessing leftover dishes by adding spices and adjusting rice portions to customer requests helps reduce potential waste. These adaptations emerged during the pandemic, when fluctuations in consumer eating habits forced managers to quickly adjust ingredient quantities and production schedules to ensure business continuity.

“We also adjust consumer consumption patterns to the stock of food we cook the next day. We see what is sold out (popular) and what is not.”

On the other hand, the effectiveness of these initiatives is limited by the waste transportation system run by sub-district volunteers, where all types of waste are combined without sorting, hindering organic recycling efforts. Limitations in facilities, such as the absence of nearby trash bins, which are deliberately avoided to maintain the cleanliness of *Warung Tegal*, also limit the ability of managers to carry out independent waste management measures.

“Our goal is to have no trash bins around the area because we don't want to give the impression of being dirty.”

Waste processing programs based on maggot composting, organized by the government and communities such as FoodCycle Indonesia, are not yet fully accessible to *Warung Tegal* due to additional costs and space requirements. Therefore, targeted access to information and institutional support are crucial to strengthening *Warung Tegal's* capacity to implement sustainability practices for food waste management.

DISCUSSION

This study confirms that, although the National Waste Management Information System (SIPSN) administrative data does not fully reflect the volume of food waste at the *Warung Tegal level*, and direct quantitative analysis is limited by tools and resources, the three *Warung Tegal* in this study have demonstrated alignment between operational practices and the behavioral mechanisms described in the Theory of Planned Behavior and Social Cognitive Theory.

Positive attitudes toward the environmental and economic consequences of food waste motivate managers to adjust daily stock based on observations of the previous day's leftovers, repurpose unsold dishes by adding seasoning, and adjust rice portions according to customer needs [16,17]. Subjective norms are shaped by consumer support for portion control initiatives and the tendency to finish meals, and are also reinforced by social modeling among customers and employees [18-19]. Perceived behavioral control is manifested in daily morning planning for fresh ingredient purchases, limiting cooking sessions to a maximum of two per day, and strategies to understand customer consumption patterns consistent with accurate demand forecast recommendations and proactive communication [11,20].

Basic knowledge about the environmental impact of food waste and the belief in the importance of ingredient freshness drive decisions not to rely on long-term storage, though there is still a need to deepen knowledge about organic waste sorting, composting, and food donation [8,21]. External environmental barriers include a waste collection system that mixes waste, the absence of nearby waste bins to maintain cleanliness, and limited access to government maggot composting programs. The Food Cycle Indonesia community has

highlighted the need for policy interventions and enhanced practical outreach and education to strengthen the synergy between personal and environmental factors in sustainable efforts to reduce food waste in the *Warung Tegal* sector [22].

As a follow-up, *Warung Tegal* is advised to take care of permits through the OSS system or *Jakpreneur* services in order to access environmental support programs, put up posters of menu design and portion information to increase awareness of all parties, while the DKI Jakarta Provincial Environmental Agency needs to expand the socialization and evaluation of the 3R (Reduce, Reuse, Recycle) program and provide waste sorting training to community service officers.

The limitations of this study indicate that quantitative data on waste generation cannot be accurately described due to the lack of information in official government records. The informal sector, such as street food stalls, allows for recording the number of stalls and the waste generated in this sector. Additionally, social desirability bias may occur because informants may provide answers that are considered socially acceptable and do not accurately reflect actual practices. Further research is recommended to conduct quantitative or mixed-methods studies with broader geographic coverage and a larger sample size to produce objective, representative numerical data on the relationship between food waste behavior and environmental impacts in the informal food stall sector.

CONCLUSION

We found that effective food waste management at *Warung Tegal* X, Y, and Z is driven by strong managerial control, adaptive operational practices, and positive staff awareness of economic and hygiene benefits. However, overall sustainability efforts remain constrained by limited consumer awareness and structural obstacles, including unsegregated municipal waste collection and inadequate local disposal facilities.

To overcome these barriers, stall owners should register for government support programs and post clear portion information, while environmental agencies expand 3R education and waste-sorting training. Finally, future research should utilize broader quantitative methods to generate representative data on food waste behavior across the informal food stall sector.

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AUTHOR CONTRIBUTION

SM developed the study, collected and analysis the data and drafted the 1st draft of manuscript; EM and Z developed the study, supervised data collection and analysis, and edited the manuscript.

CONFLICT OF INTEREST

All authors declare no conflict of interest occurred in the study.

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REFERENCES

1. United Nations Environment Programme. Food Waste Index Report 2024: Think Eat Save: Tracking progress to halve global food waste [Internet]. Nairobi: UNEP; 2024 [cited 2024 Apr 1]. Available from: <https://www.unep.org/resources/publication/food-waste-index-report-2024>
2. Sistem Informasi Pengelolaan Sampah Nasional (SIPSN). Timbulan Sampah [Internet]. Jakarta: Kementerian Lingkungan Hidup dan Kehutanan; 2024 [cited 2025 Apr 14]. Available from: <https://sipsn.menlhk.go.id/sipsn/public/data/timbulan>
3. Rudziak P, Batung E, Luginaah I. The effects of gases from food waste on human health: a systematic review. *PLoS One*. 2024 Mar 1;19(3):e0300801.
4. Environmental Protection Agency (US). A Guide to Conducting and Analyzing a Food Waste Assessment. Washington (DC): EPA; 2014 Mar.
5. Badan Pusat Statistik. Statistik Penyedia Makan Minum 2020 [Internet]. Jakarta: Badan Pusat Statistik; 2022 May [cited 2025 Apr 14]. Available from: <https://www.bps.go.id/id/publication/2022/06/15/73d93fd0f16f665fe3b60f56/statistik-penyedia-makan-minum-2020.html>
6. Tri J, Dida S. Makanan dan Budaya Makan: Usaha Makanan Etnik “Warung Tegal” Pada Masyarakat Multikultur Jakarta. *Jurnal Visi Komunikasi*. 2019 Nov;18(2):1-17.
7. Wulansari D, Ekayani M, Karlinasari L. Kajian Timbulan Sampah Makanan Warung Makan. *Ecotrophic*. 2019;13(2):125-34.
8. Fajri TN, Shauki ER. Potensi Food Loss dan Food Waste pada UMKM: MFCA, Nudging dan Neutralization Theory. *Jurnal Aplikasi Akuntansi*. 2023 Feb 6;7(2):328-45.
9. Ajzen I. The Theory of Planned Behavior. *Organizational Behavior and Human Decision Process*. 1991;50(2):179-211.
10. Watanabe EA, Freitas MG, Demo G. Food Waste in Restaurants: Evidence from Brazil and the United States. *Journal of International Food and Agribusiness Marketing*. 2023;35(3):283-304.
11. Blešić I, Petrović MD, Gajić T, Tretiakova TN, Syromiatnikova JA, Radovanović M, et al. How the Extended Theory of Planned Behavior can be applied in the research of the influencing factors of food waste in restaurants: Learning from Serbian urban centers. *Sustainability*. 2021 Aug 2;13(16):9236.
12. Bandura A. Social foundations of thought and action: a social cognitive theory. Englewood Cliffs (NJ): Prentice-Hall; 1986.
13. Lu MY, Ko WH. Sustainable Preparation Behavior for Kitchen Staff in Order to Limit Food Waste. *Foods*. 2023 Aug 12;12(16):3028.
14. Huang CH, Tseng HY. An exploratory study of consumer food waste attitudes, social norms, behavioral intentions, and restaurant plate waste behaviors in Taiwan. *Sustainability*. 2020 Nov 23;12(22):9784.
15. Young A, Sima H, Luo N, Wu S, Gong Y, Qian X. Ugly produce and food waste management: An analysis based on a social cognitive perspective. *Journal of Retailing Consumer Service*. 2024 Jul;79:103829.
16. Güdek M. Reducing plate waste in all-inclusive resorts: Strategy, precaution and barriers. *Journal of*

- Multidisciplinary Academic Tourism. 2024 Sep 30;9(2):145-56.
17. Coşkun A, Yetkin Özbük RM. What influences consumer food waste behavior in restaurants? An application of the extended theory of planned behavior. *Waste Management*. 2020 Nov 1;117:170-8.
 18. Alsuwaidi M, Eid R, Agag G. Tackling the complexity of guests' food waste reduction behaviour in the hospitality industry. *Tour Manag Perspect*. 2022 Apr;42:100963.
 19. Elkhwesky Z, Castañeda-García JA, El Manzani Y, Ur Rehman S, Hassan H. Hotel employees' intention not to waste food: The role of environmental concern. *Current Psychology*. 2024 Jul;43(26):22593-610.
 20. Wu CME, Teng CC. Reducing Food Waste in Buffet Restaurants: A Corporate Management Approach. *Foods*. 2022 Dec 28;12(1):162.
 21. Chang W, Jiang M, Arshad MH. From posts to action: Leveraging Social Media to Inspire Food Waste Reduction in Hospitality for a Net Zero Future. *Sustainability*. 2024 Dec 23;16(24):11296.
 22. Liang Y, Song Q, Liu G, Li J. Uncovering residents and restaurants' attitude and willingness toward effective food waste management: A case study of Macau. *Waste Management*. 2021 Jul 1;130:107-16.

