Research Article

Examining Food Waste Behaviour and Its Influencing Factors Among UiTM Terengganu Students

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Abstract
Food waste remains a major global challenge to environmental sustainability, with young consumers often contributing due to poor meal planning and limited awareness of waste-reduction practices. Among students, it is further driven by convenience and tight budgets. This study explored food waste behaviour among UiTM Terengganu students, examining the influence of attitudes, subjective norms, perceived behavioural control, and personal norms. Using a quantitative, cross-sectional, correlational design, data were collected through a structured questionnaire from students living in dormitories or rented houses via simple random sampling. Descriptive statistics and Pearson correlations revealed that food waste behaviour was moderately and negatively related to subjective norms ($r = -0.273$, $p < 0.01$) and perceived behavioural control ($r = -0.239$, $p < 0.01$), and weakly and negatively related to personal norms ($r = -0.120$, $p < 0.05$). Attitude was moderately correlated with subjective norms ($r = 0.429$, $p < 0.01$), strongly with perceived behavioural control ($r = 0.510$, $p < 0.01$), and most strongly with personal norms ($r = 0.572$, $p < 0.01$). Subjective norms were strongly associated with perceived behavioural control ($r = 0.686$, $p < 0.01$)

and moderately with personal norms ($r = 0.509$, $p < 0.01$), while perceived behavioural control showed a strong link with personal norms ($r = 0.672$, $p < 0.01$).

Keywords:
Food waste, behavioural intention, subjective norms, perceived behavioural control, personal norms

1 Introduction

Food is essential for human survival, yet food waste is a growing worldwide problem. While some communities face shortages, others generate excessive waste (Chuah et al., 2020). Food loss and waste threaten global sustainability. Food loss occurs during production, post-harvest handling, and processing, especially in low-income countries, while food waste happens when consumers discard food after purchase (FAO, 2024). As the world population rises, awareness of resource limits and the environmental impact of waste increases. Food waste contributes to soil degradation, greenhouse gas emissions, and the misuse of labour, energy, and water (Martin, 2023).

Young consumers are often major contributors to food waste, largely due to poor meal planning and limited awareness of waste reduction practices (Ozanne et al., 2022). Various factors, known as food choice motives, shape their eating habits and consumption patterns. Since habits strongly influence food waste behaviour, understanding these motives is key to addressing the issue (Russell et al., 2020). Psychosocial and demographic factors, including attitudes (Pandey et al., 2023), knowledge (Gabriel et al., 2021), habits (Morata et al., 2020), social influences, and perceived behavioural control (Mganga et al., 2021), play an important role in forming food consumption habits.

Social and cultural norms strongly influence student attitudes and behaviours towards waste (Akhter et al., 2024). Their habits depend on awareness of sustainability initiatives and their ability to integrate them into daily life. Local culinary traditions also shape the types of food consumed and portion sizes. Students from different cultures may misjudge how much they need, creating leftovers. In communities where large serving reflects hospitality, student may waste food when they cannot finish their meals (Alattar et al., 2020). Cultural values affect how food is viewed, prepared, consumed, and discarded. In some societies, waste is seen as morally wrong, while others prioritise abundance, unintentionally increasing waste (Purwanto et al., 2023).

Food waste is particularly common among students, driven by convenience and budget constraints (Ozanne et al., 2022). Limited awareness of the environmental and economic impact further aggravates the problem, highlighting the need for education and sustainable consumption practices. Theories such as the Theory of Planned Behaviour (TPB) and the Theory of Reasoned Action (TRA) explain how attitudes, subjective norms, perceived behavioural control, and personal values influence wasteful behaviour (Hubinger, 2022). Guided by this model, this study investigates food waste behaviour among UiTM Terengganu students, focusing on the roles of attitudes, subjective norms, perceived behavioural control, and personal norms.

2 Literature Review

2.1 Food Waste Behaviour

The Theory of Planned Behaviour, a widely used framework in social psychology that was proposed by Ajzen in 1991, provides extensive insight into the determinants of food waste behaviour and helps develop effective interventions intended to minimise waste (Lin & Guan, 2021). The three main elements, which are attitudes, subjective norms, and perceived behavioural control, are also closely linked to socioeconomic status, cultural norms, and demographic factors that affect food waste behaviour (Akhter et al., 2024). They comprise beliefs about the likely outcomes of actions, the current societal norms, and factors that can facilitate or hinder the execution of actions (Etim et al., 2024). Coskun and Ozbuk (2020) stated that the fundamental components of the Theory of Planned Behaviour, which include attitudes, subjective norms, and perceived behavioural control, not only affect human actions but also inform intentions and subsequent behaviours (Lin & Guan, 2021). In Malaysia, attitudes, perceived behavioural control, and personal norms are key predictors of the intention to reduce food waste, with awareness of consequences and responsibilities further strengthening personal norms (Chun et al., 2021). According to Rahman & Wong (2023), in Sarawak households, attitudes, control, and the intention to avoid waste are linked to lower food waste, while subjective norms play a weaker role.

The Theory of Planned Behaviour asserts that individuals participate in rational decision-making processes by evaluating the potential outcomes of their choices before making decisions. Subjective norms encapsulate the impact of societal expectations and the perspectives of others, whereas attitudes pertain to the favourable or unfavourable assessments of a specific behaviour (Lin & Guan, 2021). Perceived behavioural control refers to an individual's belief in their ability to exert control over a behaviour, as well as their confidence in carrying it out effectively.

2.2 Attitude

Attitudes refer to individuals' positive or negative evaluations of a particular behaviour. Students' attitudes towards food waste may be shaped by their beliefs about its environmental impacts, ethical considerations, and personal values related to sustainability. According to Ajzen (2020), a person's attitude towards food waste reduction influences whether they choose to engage in or avoid such behaviour. Previous studies have found that attitudes positively affect the intention to minimise food waste and play a pivotal role in shaping behavioural intentions (Coskun & Ozbuk, 2020).

These findings suggest that framing food waste as an environmental problem can effectively encourage waste-reduction practices. For example, negative attitudes towards composting may stem from perceptions that it is time-consuming or inconvenient. Similarly, limited awareness of the environmental consequences of food waste and the benefits of composting can foster unfavourable views towards green disposal practices (Castro et al., 2023). Social norms and cultural traditions surrounding

food disposal may also contribute to resistance towards sustainable disposal strategies (Etim et al., 2024)

H1: There is a significant relationship between attitude and food waste behaviour

2.3 Subjective Norms

Subjective norms refer to the social pressures or expectations that individuals perceive regarding how they should behave in each situation. Among students, these pressures may arise from peer influence, cultural attitudes towards food waste, or institutional policies that promote sustainability. They represent the expectations of significant referents and societal pressures to adopt waste-reduction behaviours (Jamaludin et al., 2020). Individuals may feel obliged to address or disregard food waste due to family, peer, or broader social influences (Rastegari et al., 2023). Recognising the environmental harm caused by food waste and taking personal responsibility are essential to mitigating the problem.

Practical actions include reusing leftovers, purchasing only necessary quantities, and improving meal-planning skills (Batool et al., 2023). Participation in community-based initiatives such as food banks and composting schemes can also contribute to waste minimisation (GOV.UK, 2021). Ultimately, perceptions of others' expectations and approval play a substantial role in shaping decision-making regarding food waste.

H2: There is a significant relationship between subjective norms and food waste behaviour

2.4 Perceived Behavioural Control

Perceived behavioural control describes people's views of their ability to carry out a target behaviour. Self-efficacy (e.g., believing one can minimise food waste), knowledge about food storage and consumption, and access to resources (e.g., composting facilities or food-sharing apps) are significant factors that influence perceived control over food waste management (Shi et al., 2021). In the Theory of Planned Behaviour, perceived behavioural control refers to an individual's perception of how easy or difficult it would be for them to adopt a specific behaviour, based on the perceived presence or absence of facilitating or inhibiting factors (Gultom et al., 2020). Perceived behavioural control is thought to impact both behavioural intentions and actual behaviour directly. Individuals who feel they have limited control over their circumstances are less likely to develop strong intentions to engage in an activity, even if they have a positive attitude and perceive supportive social norms. Cultural attitudes can influence the notion of control. For example, in some cultures, leaving food on the plate is seen as a sign of respect for the host, whereas in others, this practice is viewed as wasteful (Etim et al., 2024). Similarly, domestic norms and societal expectations surrounding food consumption can shape individuals' views of their control over reducing waste (Oria et al., 2020). Changing ingrained habits, such as families consistently not finishing meals, can pose significant challenges. Therefore, the development of effective strategies to reduce food waste must consider contextual factors, social norms, and cultural attitudes.

H3: There is a significant relationship between perceived behavioural control and food waste behaviour

2.5 Personal Norms

Personal norms denote an individual's moral responsibility to engage in behaviours that reduce food waste. They are triggered when individuals become aware that their behaviour has a negative impact on others and society, and when they also feel personally accountable for the impacts (Wang et al., 2022). Strong moral responsibility is a significant driver to take specific measures to limit waste. Empirical evidence suggests that individuals with a heightened sense of personal responsibility are more likely to take active measures to reduce food waste. Personal norms exert a significant influence on behavioural intentions and are a distinguishing factor in determining motivation to act. Furthermore, they are recognised as a major predictor with a positive effect on an individual's intention to participate in waste-reduction activities (Wang et al., 2022).

H4: There is a significant relationship between personal norms and food waste behaviour

3 Methodology

3.1 Research Design

This study employed a structured questionnaire to examine the relationship between attitudes and behaviour about food waste. A quantitative methodological approach was adopted, utilising a survey method to investigate the influence of attitudes, subjective norms, personal norms, and perceived behavioural control on UiTM Terengganu students' intentions to reduce food waste. The questionnaire was administered to students residing in rented accommodation or college dormitories using a cross-sectional design. Participants could complete the survey at a time and location of their choice, ensuring convenience and accessibility. The individual respondent served as the unit of analysis, with responses based on personal experiences of food waste.

3.2 Data Collection and Instrument Development

Survey data were collected online via Google Forms. The completed responses were subsequently analysed and evaluated to draw conclusions and formulate recommendations. The questionnaire link was distributed through email and WhatsApp to maximise reach. To ensure clarity and ease of participation, the survey instrument was developed in both English and Malay. This bilingual approach helped to minimise language barriers and improve the reliability of the responses. A five-point Likert scale (1 = strongly disagree to 5 = strongly agree) was employed to capture nuanced responses, allowing for a deeper understanding of students' attitudes towards and behaviours regarding food waste.

The questionnaire comprised two main sections: demographic and food waste management and behaviour. The demographic section gathered respondents' demographic details, including age, gender, living arrangement (college dormitory or rented accommodation), level of education, and monthly food expenditure (Chuah & Singh, 2020). The food waste management and behaviour section assessed food waste behaviour using items adapted from Chuah and Singh (2020), covering four domains: food waste behaviour, which examines general tendencies regarding food waste. Food recycling practices, which examine methods used to reuse or recycle food. Food waste disposal methods examine how respondents manage and dispose of food waste, while meal planning habits assess the strategies adopted to minimise food waste.

4 Findings

4.1 Demographic Profile

Table 1 presents the demographic characteristics of the 365 respondents from UiTM Terengganu, covering branch, gender, age, residence, and weekly budget.

Table 1: Frequency result of respondent profile

Demographic variables	Categories	Frequencies	Percentage (%)
Branch	Dungun	190	52.1
	Chendering	77	21.1
	Bukit Besi	98	26.8
Gender	Male	99	27.1
	Female	266	72.9
Age (years old)	18-19	109	29.9
	20-21	62	17.0
	22-23	138	37.8
	24-25	44	12.1
	26-27	12	3.3
Stay	On-campus	272	74.5
	Off-campus	93	25.5
Budget per week	Below RM50	100	27.4
	Above RM50	149	40.8
	Above RM100	116	31.8

Note: n = 365

Most respondents were from UiTM Dungun, representing 52.1% (n = 190), followed by Bukit Besi (26.8%, n = 98) and Chendering (21.1%, n = 77). The gender distribution is notably imbalanced, with female respondents comprising 72.9% (n = 266) compared to 27.1% (n = 99) male respondents. In terms of age, the most significant proportion falls within the 22–23 age group (37.8%, n = 138), followed by those aged 18–19 (29.9%, n = 109). Respondents aged 20–21 account for 17.0% (n = 62), while those aged 24–25 represent 12.1% (n = 44). The smallest proportion is the 26–27 age group, at only 3.3% (n = 12). A substantial majority (74.5%, n = 272) reside on campus, while the remaining

25.5% (n = 93) live off campus. Regarding weekly budget, 40.8% (n = 149) spend above RM50, 31.8% (n = 116) spend above RM100, and 27.4% (n = 100) spend less than RM50.

The demographic profile indicates that more than half of the respondents were from UiTM Dungun (52.1%), because it is the largest of the three campuses, offering a broader range of programmes and enrolling more students than Bukit Besi and Chendering. Its central location and the greater accessibility of data collection points may also have encouraged higher participation. The sample was predominantly female (72.9%), reflecting the wider trend across many Malaysian higher education institutions, where female enrolment often exceeds that of males, particularly in the social sciences and service-oriented disciplines. Regarding age, the largest proportion of respondents was 22–23 years old, which is consistent with the typical age of students approaching the end of their undergraduate studies, while the smaller numbers of younger and older students suggest some diversity within the cohort. A substantial majority (74.5%) resided on campus, unsurprisingly, given the convenience and relative affordability of university accommodation, while the remainder lived off campus. Weekly spending patterns were varied: most respondents reported budgets exceeding RM50, with almost one-third spending more than RM100, indicating differences in students' financial circumstances and lifestyle preferences.

4.2 Reliability Test

Table 2 presents Cronbach's alpha values for the dependent variable, food waste behaviour, and the independent variables: attitude, subjective norms, perceived behavioural control, and personal norms.

Table 2: Reliability test

Variables	Number of items	Cronbach's Alpha
Food Waste Behaviour	4	0.715
Attitude	5	0.856
Subjective Norms	5	0.887
Perceived Behavioural Control	5	0.867
Personal Norms	6	0.925

The reliability test was conducted to assess the internal consistency of the measurement items using Cronbach's alpha, which evaluates the extent to which items measure the same underlying construct. The number of items per scale ranged from four to six, an appropriate range for assessing these constructs. The Food Waste Behaviour scale recorded a Cronbach's alpha of 0.715, which falls within the acceptable range, indicating reasonable internal consistency; however, some improvement may still be possible. The scale for attitude achieved an alpha of 0.856, demonstrating good internal consistency, with items showing strong intercorrelation in measuring the construct.

Subjective norms recorded a Cronbach's alpha of 0.887, indicating high reliability, while perceived behavioural control achieved a Cronbach's alpha of 0.867, also reflecting strong internal consistency. The Personal Norms Scale yielded the highest

reliability score (α = 0.925), indicating excellent consistency among its items. Overall, all variables demonstrated acceptable to excellent reliability, with personal norms exhibiting the highest internal consistency, followed by subjective norms and perceived behavioural control. Food waste behaviour showed the lowest alpha value but remained within the acceptable range.

4.3 Descriptive Analysis

The dependent variable in this study is food waste behaviour, as presented in Table 3. This variable was measured using a five-point Likert scale, ranging from "strongly disagree" (1) to "strongly agree" (5). The questionnaire included several statements related to food waste behaviour, and the mean scores obtained from the descriptive analysis were used to evaluate the attitudes of UiTM Terengganu students towards food waste.

Table 3: Means and standard deviation for food waste behaviour

Construct	Item	Mean	SD
Food waste behaviour	Have you ever wasted your food?	3.55	1.112
	How much food do you waste in a day?	3.31	1.160
	How much food waste do you recycle?	4.12	1.029
	How do you manage your leftover food?	3.95	1.043

Standard Deviations = SD

The findings, summarised in Table 3, show that mean scores for the dependent variable ranged from 3.31 to 4.12, suggesting that most respondents agreed or strongly agreed with the statements. The highest mean score was recorded for the item *"How much food waste do you recycle?"* (M = 4.12, SD = 1.029), indicating a strong commitment to recycling food waste. The second-highest mean score was for *"How do you manage your leftover food?"* (M = 3.95, SD = 1.043), reflecting the importance respondents place on managing leftovers. The statement *"Have you ever wasted your food?"* yielded a mean score of 3.55 (SD = 1.112), showing general agreement. The lowest mean score, *"How much food do you waste in a day?"* (M = 3.31, SD = 1.160), still fell within the agreement range, suggesting that while food waste is acknowledged, its daily volume may be perceived as moderate.

Table 4: Mean and standard deviation for attitude

Construct	Items	Mean	SD
Attitude	I believe that reducing food waste is very important.	4.46	0.648
	I feel very happy when I reduce food waste.	4.39	0.702
	I believe reducing food waste is a sensible approach.	4.48	0.627
	I believe reducing food waste is a good idea.	4.54	0.599
	I believe reducing food waste is very beneficial.	4.49	0.618

Standard Deviations = SD

The attitude towards food waste construct recorded the highest individual item score in the study: *"I believe reducing food waste is a good idea."* (M = 4.54, SD = 0.599).

Other items within this construct also received similarly high ratings, such as *"I believe that reducing food waste is very important."* (M = 4.46, SD = 0.648) and *"I feel very happy when I reduce food waste."* (M = 4.39, SD = 0.702), indicating strong and consistent agreement that reducing food waste is both valuable and desirable.

Table 5: Mean and standard deviation for subjective norms

Construct	Items	Mean	SD
Subjective norms	Most people important to me believe that I should reduce food wastage.	4.29	0.793
	People often encourage me to reduce food wastage.	4.11	0.982
	It is expected of me to reduce food wastage.	4.21	0.862
	I feel social pressure to reduce food wastage.	3.79	1.232
	People like me tend to reduce food waste.	4.13	0.881

Standard Deviations = SD

For subjective norms, the highest score was for *"Most people important to me believe that I should reduce food wastage."* (M = 4.29, SD = 0.793). While this suggests that social expectations play a role, the comparatively lower score for *"I feel social pressure to reduce food wastage"* (M = 3.79, SD = 1.232) indicates that such pressure is not uniformly experienced.

Table 6: Mean and standard deviation for perceived behavioural control

Construct	Items	Means	SD
Perceived behavioural control	I find it easy to prepare new meals from leftovers.	3.93	1.008
	I find it easy to ensure that only a small amount of food is thrown away each day.	4.16	0.887
	I find it easy to plan my food shopping so that all the food I purchase is eaten.	4.24	0.811
	I feel capable of taking action to reduce the food I throw away.	4.04	0.981
	People around me enable me to reduce the amount of food waste.	4.20	0.859

Standard Deviations = SD

Within perceived behavioural control, the strongest agreement was with *"I find it easy to plan my food shopping so that all the food I purchase is eaten."* (M = 4.24, SD = 0.811), suggesting that respondents generally feel capable of managing food waste through effective planning. Overall, the high mean scores across this construct indicate a strong sense of self-efficacy in controlling food waste.

Table 7: Mean and standard deviation for personal norms

Construct	Items	Means	SD
Personal norms	I feel guilty when throwing away food, knowing that some people do not have enough to eat.	4.51	0.709
	I believe I would be a better person if I avoided wasting food or adopted a zero-waste approach.	4.46	0.705
	I feel concerned about food waste, as producing, processing, packaging, and transporting food requires substantial resources.	4.36	0.764
	I feel obliged to consider food wastage when making food choices.	4.39	0.725
	When I buy food, I feel morally obliged not to waste it.	4.39	0.754
	I feel morally obliged to reduce food wastage regardless of others' opinions.	4.40	0.752

Standard Deviations = SD

4.4 Pearson Correlation

As shown in Table 8, perceived behavioural control, attitudes, and subjective norms all have strong positive associations, indicating that they collectively influence food waste behaviour.

Table 8: Pearson correlation

	Food waste behaviour	Attitude	Subjective norms	Perceived behavioural control	Personal norms
Food waste behaviour	1	.027	–.273**	–.239**	–.120*
Sig. (2-tailed)	–	.602	.000	.000	.022
Attitude towards food waste	.027	1	.429**	.510**	.572**
Sig. (2-tailed)	.602	–	.000	.000	.000
Subjective norms	–.273**	.429**	1	.686**	.509**
Sig. (2-tailed)	.000	.000	–	.000	.000
Perceived behavioural control	–.239**	.510**	.686**	1	.672**
Sig. (2-tailed)	.000	.000	.000	–	.000
Personal norms	–.120*	.572**	.509**	.672**	1
Sig. (2-tailed)	.022	.000	.000	.000	–

Note: n = 365

The correlation between food waste behaviour and attitude towards food waste is weak, indicating that an individual's attitude does not strongly align with their actual behaviour. For subjective norms, there is a moderate negative correlation with food waste behaviour ($r = -0.273$, $p < 0.01$), suggesting that stronger perceived social pressures are associated with a reduced tendency to waste food. Similarly, perceived

behavioural control exhibits a moderate negative correlation with food waste behaviour ($r = -0.239$, $p < 0.01$), suggesting that individuals who perceive themselves as having greater control over their actions are less likely to waste food. A weak negative correlation was found between food waste behaviour and personal norms ($r = -0.120$, $p < 0.05$), further suggesting that stronger personal norms are only slightly associated with a reduction in food waste.

A moderate positive correlation exists between attitude and subjective norms ($r = 0.429$, $p < 0.01$), indicating that individuals with a more favourable attitude towards reducing food waste also perceive stronger social expectations to do so. Attitude is strongly and positively correlated with perceived behavioural control ($r = 0.510$, $p < 0.01$), suggesting that those with positive attitudes are more confident in their ability to manage food waste. The strongest association is observed between attitude and personal norms ($r = 0.572$, $p < 0.01$), indicating that positive attitudes are closely aligned with stronger moral obligations to reduce food waste.

Subjective norms are strongly and positively correlated with perceived behavioural control ($r = 0.686$, $p < 0.01$), meaning that individuals who feel greater social pressure to reduce food waste also perceive themselves as more capable of doing so. A moderate positive correlation exists between subjective and personal norms ($r = 0.509$, $p < 0.01$), suggesting that social expectations often align with personal moral standards in shaping food waste reduction behaviour.

A strong positive correlation between perceived behavioural control and personal norms ($r = 0.672$, $p < 0.01$) indicates that individuals with a greater sense of control over their actions also tend to hold stronger moral commitments to avoid food waste. Overall, the results suggest that personal norms, subjective norms, and perceived behavioural control play significant roles in influencing food waste behaviour, with stronger social pressure, moral obligation, and self-efficacy being associated with reduced waste. In contrast, attitudes towards food waste demonstrate only a weak relationship with actual behaviour, indicating that positive attitudes alone may be insufficient to drive behavioural change without the reinforcement of social expectations and perceived control.

5 Discussion

This study on food waste behaviour among UiTM Terengganu students highlights how attitudes, subjective norms, perceived behavioural control, and personal norms shape wasteful behaviour. The findings offer useful guidance for reducing food waste in student communities and beyond. The research also explored the effect of demographic and psychosocial factors, with each objective discussed below.

5.1 Relationship between attitude and food waste behaviour

The correlation between attitudes towards food waste and reported food waste behaviour was weak and non-significant ($r = 0.027$, $p = 0.602$). This finding raises

questions about the efficacy of attitudes alone in driving behavioural change. Although previous research has emphasised the role of attitudes in shaping waste reduction intentions, studies by Ajzen (2020) indicate that attitudes may not necessarily translate into actual behaviour without the influence of other factors, such as social norms or perceived behavioural control. This supports the Theory of Planned Behaviour, which posits that while attitudes are influential, they cannot, in isolation, reliably predict behaviour.

5.2 Relationship between subjective norms and food waste behaviour

Food waste behaviour was moderately and negatively correlated with subjective norms ($r = –0.273$, $p < 0.01$), indicating that stronger perceived social expectations were associated with lower levels of wasteful practices. This highlights the influence of societal pressures and cultural norms on students' behaviour, consistent with findings by Jamaludin et al. (2020) and Gultom et al. (2020). Peer influence and community expectations appear to discourage wasteful habits, suggesting that interventions such as peer-led initiatives and awareness campaigns could leverage these social pressures to promote sustainable practices among UiTM Terengganu students.

5.3 Relationship between perceived behavioural control and food waste behaviour

A significant negative correlation was found between perceived behavioural control and food waste behaviour ($r = –0.239$, $p < 0.01$). Students who felt more capable of managing their food, for example, by planning meals or reusing leftovers, reported lower levels of waste. This supports the TPB assertion that intention and behaviour are significantly influenced by perceived behavioural control (Adel et al., 2023). Providing students with practical tools, such as meal-planning applications or effective food storage strategies, could enhance their perceived control and consequently reduce food waste.

5.4 Relationship between personal norms and food waste behaviour

A weak but significant negative correlation was found between personal norms and food waste behaviour ($r = –0.120$, $p < 0.05$). Students with stronger moral convictions about avoiding food waste reported lower levels of waste, a finding that aligns with those of Wang et al. (2022). Ethical considerations, including feelings of guilt associated with waste, appear to motivate more sustainable behaviours. These findings align with the Theory of Planned Behaviour and other behavioural models, which conceptualise food waste as shaped by multiple interrelated factors rather than single predictors. Attitudes, subjective norms, perceived behavioural control, and personal norms interact to influence behaviour. For example, students who feel empowered to manage food waste may also internalise a stronger moral imperative to act sustainably.

This is supported by the strong positive correlation between perceived behavioural control and personal norms ($r = 0.672$, $p < 0.01$), suggesting that greater self-efficacy is associated with more substantial ethical commitment to waste reduction. Hubinger (2022) similarly argues that psychosocial factors operate synergistically to encourage

waste-reduction behaviours. Furthermore, cultural perspectives emphasising the influence of community and societal values are consistent with these results. As Setiawan et al. (2021) note, individuals tend to conform more readily to waste minimisation practices in societies where such behaviour is highly valued. This societal pressure could therefore amplify the impact of targeted interventions aimed at reducing food waste.

6 Conclusion

Attitudes, personal norms, and perceived behavioural control emerged as the principal determinants of food waste behaviour among students at UiTM Terengganu. In contrast, subjective norms did not show a direct alignment with actual behaviour, underscoring the need for more targeted interventions. To cultivate a sustainable campus culture, UiTM Terengganu could introduce initiatives that reinforce positive social norms through awareness campaigns, promote food-sharing apps such as OLIO and ReMeal, provide students with practical tools for waste reduction, such as portion planning guides and composting bins, and appeal to their moral and ethical values. Addressing food waste effectively necessitates an integrated approach that unites research, community engagement, and education. With its established commitment to sustainability, UiTM Terengganu is well-placed to serve as an exemplar for other higher educational institutions, demonstrating how universities can lead in fostering sustainable practices among future generations.

However, this study is not without limitations. The cross-sectional design limits the ability to infer causality, and relying on self-reported data may lead to social desirability bias. Furthermore, as the research was conducted within UiTM Terengganu, the findings may not be fully generalisable to other contexts. Future research could employ longitudinal designs, include diverse institutional settings, and incorporate observational or experimental methods to strengthen the validity of results.

Future research should broaden the scope by including students from other UiTM campuses and higher educational institutions to enhance the generalisability of findings. Comparative studies across regions or types of institutions could reveal contextual differences in food waste behaviour. Incorporating qualitative methods, such as interviews or focus groups, would provide richer insights into students' motivations, beliefs, and barriers to reducing waste. Mixed-method designs could also link these deeper perspectives with quantitative measures, offering a more comprehensive understanding of the factors shaping food waste behaviour.

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8 References

Adel, A. M., Dai, X., & Roshdy, R. S. (2023). Investigating the factors influencing food waste behavior in the Egyptian society. *Journal of Humanities and Applied Social Sciences*. https://doi.org/10.1108/jhass-06-2023-0067

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Ajzen, I. (2020). The theory of planned behavior: Frequently asked questions. *Human Behavior and Emerging Technologies, 2*(4), 314–324. https://doi.org/10.1002/hbe2.195

Akhter, S., Rather, M. I., & Zargar, U. R. (2024). Understanding the food waste behaviour in university students: An application of theory of planned behavior. *Journal of Cleaner Production, 437*, 140632. https://doi.org/10.1016/j.jclepro.2023.140632

Alattar, M., DeLaney, J., Morse, J., & Nielsen-Pincus, M. (2020). Food waste knowledge, attitudes, and behavioral intentions among university students. *Journal of Agriculture, Food Systems, and Community Development*, 1–16. https://doi.org/10.5304/jafscd.2020.093.004

Batool, F., Kurniawan, T. A., Mohyuddin, A., Setiadi, A., Kamal, M. A., Tseng, M.-L., Imran, M., & Lee, C.-H. (2023). Environmental impacts of food waste management technologies: A critical review of life cycle assessment (LCA) studies. *Trends in Food Science & Technology, 143*, 104287. https://doi.org/10.1016/j.tifs.2023.104287

Castro, C., Chitikova, E., Magnani, G., De Lucia, C., & Palladino, R. (2023). Less is more: Preventing household food waste through mobile applications. *Sustainability, 15*(13), 10597. https://doi.org/10.3390/su151310597

Chuah, S. C., & Singh, J. K. (2020). Food waste and disposal behaviour among university students. *Advances in Business Research International Journal, 6*(2), 166–176. https://doi.org/10.24191/abrij.v6i2.10413

Chun, T. L., Moorthy, K., Gunasaygaran, N., Sek, L. C., Omapathi, D., Jia, Y. H., Anandan, K., & Sivakumar, K. (2021). Food waste behaviour among Malaysians: A structural equation modelling approach. Journal of the Air & Waste Management Association, 71(7), 890–905. https://doi.org/10.1080/10962247.2021.1900001

Coskun, A., & Ozbuk, R. M. Y. (2020). What influences consumer food waste behavior in restaurants? An application of the extended theory of planned behavior. *Waste Management, 117*, 170–178. https://doi.org/10.1016/j.wasman.2020.07.036

Etim, E., Choedron, K. T., Ajai, O., Duke, O., & Jijingi, H. E. (2024). Systematic review of factors Influencing household food waste behaviour: Applying the theory of planned behaviour. *Waste Management & Research*. https://doi.org/10.1177/0734242X241285423FAO. (2024). *Food loss and food waste*. Food and Agriculture Organization of the United
Nations. https://www.fao.org/policy-support/policy-themes/food-loss-and-food-waste/en
Gabriel, A., Rombach, M., Wieser, H., & Bitsch, V. (2021). Got waste: Knowledge, behavior and self-assessment on food waste of university students in Germany. *International Food and Agribusiness Management Review, 24*(6), 951–970. https://doi.org/10.22434/IFAMR2020.0145
GOV.UK. (2021). *Best practice examples on reducing household food waste*. https://assets.publishing.service.gov.uk/media/60c373938fa8f57ce63f1915/g7-alliance-resource-efficiency-best-practice.pdf
Gultom, S., Dalle, J., Restu, Baharuddin, Hairudinoar, & Gultom, S. (2020). The influence of attitude and subjective norm on citizens' intention to use e-government services. *Journal of Security and Sustainability Issues, 9*, 173–186. https://doi.org/10.9770/jssi.2020.9.M(14)
Hubinger, D. (2022). *Understanding food waste behavior and ways to influence positive change and waste reduction* (Doctoral dissertation). University of San Diego. https://digital.sandiego.edu/dissertations/926
Jamaludin, H., Mohamed, B., & Noorashid, N. A. (2020). Food waste motivational factors: The Theory of Planned Behavior and the Role of Big-Five Personality Traits on Malaysian Generation Z. *Global Business & Management Research, 12*(4), 8. https://www.gbmrjournal.com/pdf/v12n4/V12N4-2.pdf
Lin, B., & Guan, C. (2021). Determinants of household food waste reduction intention in China: The role of perceived government control. *Journal of Environmental Management, 299*, 113577. https://doi.org/10.1016/j.jenvman.2021.113577
Martin. (2023). *Sustainable consumption and production*. United Nations Sustainable Development.https://www.un.org/sustainabledevelopment/sustainable-consumption-production
Mganga, P., Syafrudin, S., & Amirudin, A. (2021). A survey of students' awareness on food waste problems and their behaviour towards food wastage: A case study of Diponegoro University (UNDIP). *E3S Web of Conferences, 317*, 01071. https://doi.org/10.1051/e3sconf/202131701071
Morata, M. P., González-Santana, R. A., Blesa, J., Frígola, A., & Esteve, M. J. (2020). A study of the habits and food waste production of young university students. *Nutrición Hospitalaria, 37*(2), 349–358. https://doi.org/10.20960/nh.02833
Oria, M., & Schneeman, B. O. (Eds.). (2020). *A national strategy to reduce food waste at the consumer level*. National Academies Press. https://www.ncbi.nlm.nih.gov/books/NBK564039/pdf/Bookshelf_NBK564039.pdf
Ozanne, L. K., Ballantine, P. W., & McMaster, A. (2022). Understanding food waste produced by university students: A social practice approach. *Sustainability, 14*(17), 10653. https://doi.org/10.3390/su141710653
Pandey, S., Budhathoki, M., Feng, K., Thomsen, M., & Reinbach, H. C. (2023). Who buys surplus meals? An exploratory survey in Danish canteens. *Foods, 12*(5), 1035. https://doi.org/10.3390/foods12051035
Purwanto, E., Biasini, N., Yulianto, A., Gunawan, T., & Wati, V. O. (2023). Attitude, intention, and behavior to reduce food waste among Generation X. *IOP Conference Series: Earth and Environmental Science, 1168*(1), 012056. https://doi.org/10.1088/1755-1315/1168/1/012056

Rahman, M. M., & Wong, L. T. (2023). Household food waste behaviour in Sarawak, Malaysia: A hierarchical regression analysis. Rawanda Medical Journal, 80(2), 39–47.

Rastegari, H., Petrescu, D. C., & Petrescu-Mag, R. M. (2023). Factors affecting retailers' fruit waste management: Behavior analysis using the theory of planned behavior and norm activation model. *Environmental Development, 47*, 100913. https://doi.org/10.1016/j.envdev.2023.100913

Russell, S., Murnane, S., & Miller, S. (2020). Food waste reduction behaviors: Exploring the application of the Theory of Planned Behavior. *Sustainability, 12*(7), 5424. https://doi.org/10.3390/su12072718

Setiawan, B., Afiff, A. Z., & Heruwasto, I. (2021). Personal norm and pro-environmental consumer behavior: An application of norm activation theory. *Asean Marketing Journal, 13*(1), 28–41. https://doi.org/10.21002/amj.v13i1.13213

Shi, M., Wang, X., & Yu, X. (2021). Does dietary knowledge affect household food waste in the developing economy of China? *Food Policy, 98*, 101896. https://doi.org/10.1016/j.foodpol.2020.101896

Wang, J., Li, M., Li, S., & Chen, K. (2022). Understanding consumers' food waste reduction behavior—A study based on extended norm activation theory. *International Journal of Environmental Research and Public Health, 19*(7), 4187. https://doi.org/10.3390/ijerph19074187