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FOOD SUPPLY CHAIN: SOCIO-DEMOGRAPHIC RELATIONSHIP WITH FOOD WASTE BEHAVIOR IN HOUSEHOLDS

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Abstract
This paper examines the relationship between sociodemographic characteristics and household food wastage in FSCs (food supply chains). Researchers identified 300 respondents as a sample for this purpose. The research team found that household food wastes removal behavior can be affected by sociodemographic factors. In Padang City, household food waste disposal behavior was strongly predicted by gender, occupation, and family income. These results verify the current concept that sociodemographic characteristics are basic indicators of FWB. Because behavioral interventions can be implemented with sociodemographic approaches and strategies must be designed to reduce the waste of food in housing related to these sociodemographic factors, this research helps urban areas minimize food wastage. The outcomes of our study can be used to guide regulatory decision-making and encourage the growth of successful initiatives to minimize the consumption of wasted food.
Keywords: food waste behavior, socio-demographic, food supply chains

INTRODUCTION

Food wastage and loss are witnessed at every milestone of the FSCs, starting with agriculture to domestic consumers (Kayikci, 2022). Indonesia is currently ranked among the top two food waste producers in the world (EIU, 2016). As per the findings of a 2021 Bappenas report, Indonesia's food loss and waste (FLW) produces anywhere between 23 and 48 mln tons of wastage per year, or 115 to 184 kg/capita. An estimated 61-125 million Indonesians, or 29-47% of the population, consume food waste. Food waste causes an annual economic loss of 213-551 trillion rupiah, or 4-5% of Indonesia's GDP. Food waste is related to the final consumption stage, which includes household, retail and consumption. The major part of food waste occurs after food is prepared, cooked or served. It also occurs when food is overused, which can be caused by bulk purchasing and poor planning, and not eaten before expiration. (Ishangulyyev, 2019)

West Sumatra Province is one of the provinces where waste issues are present in addition to those at the national scale. West Sumatra Province generated 873,156.56 tons of trash per month, of which 45.6% was food waste (SIPSN, 2023). Thus, waste issues are also present in Padang City. Food waste contributes to 63% of Padang City's daily waste generation of 643.76 tons (SIPSN, 2023). This figure will keep rising in tandem with Padang City's growing population.

The population of Padang continues to grow every year, which causes waste production - especially food waste - to increase. Food wastage volume generated by households is much higher (Hebrok, 2019). As a top producer of food waste, households are not in line with efforts to reduce food waste. Thus, the need to manage the large amounts of food waste that occur in households is driven by a number of complex issues (Karakaş, 2022).

A family is made up of a father, mother, and children, which is a key driver of food wastage (Sultana et al., 2023). Everyone has the potential to produce food wastage (Knorr et al., 2022). Our food wastage is usually associated with the following stages: planning, shopping, storage, preparation and consumption of food. Making a shopping list, estimating the amount of food before buying, checking food supplies before shopping, and organizing meals ahead of time belong to behaviors that usually get taken seriously during the planning stage (Annunziata et al., 2020; González-Santana et al., 2022; Katt, 2020).

Food wastage at the household scale can be related to five main causes, which are frequently mentioned in the literature: (1) poor planning when making purchases, which can result in impulse purchases of food or advance purchases of food that is not needed on the spot; (2) Confused " better by" and "use by" black-out periods when disposing of food; (3) inadequate stock storage or management at home; (4) overstocking of cooked and uneaten food; and (5) insufficient food preparation techniques, which can result in less food being eaten or food quality being lost during preparation or lack of knowledge regarding ways to use food wastage rather than throwing it away (J.-Q. Jiang et al., 2015; Janssens, 2019).

Planning before can help people buy less food than they require, which lowers the chance of it going bad (Närvänen et al., 2019). The findings of research on meal waste and planning behavior, however, are not entirely consistent. Some research has established a link between lower levels of food waste and more frequent

engagement in planning behaviors, whereas other research has not. (Aloysius et al., 2023; L Principato, 2019; Simões, 2022).

During our food shopping process, individuals often buy more food than we actually need (Van Geffen et al., 2016). Doing so results in a lot of food being wasted. Buying excessive amounts of food can lead to food going stale, expiring, tasting or smelling bad, and being forgotten in cupboards or refrigerators (Teng et al., 2021). Excessive shopping is linked to impulse purchases and is seen as a significant barrier to reducing food wastage (Ludovica Principato et al., 2021). Studies show that increased levels of overspending are linked to increased food waste (Nicastro & Carillo, 2021). Nonetheless, (Attiq, 2021) It has been noted that urgent buying is not always related to food wastage behavior. Many unsafe methods are linked to food waste during the storage phase. Food can be stored under conditions that are not ideal, which prevents it from reaching its maximum storage capacity (Aramyan et al., 2021). Food is going to degrade faster in improper storage conditions (Karanth et al., 2023).

The innate food hygiene of the community diet; social and economic factors; behavior of people that is difficult to change; priorities set by public and personal sector actors; diversification factors such as inadequate storage and regulations; inability to obtain knowledge or information; and failure to utilize available technology are four factors that are considered to be the major causes of food wastes in the home. These factors mainly include material factors such as food properties and packages; for social factors such as technology, retail supply, regulatory, and Cultural factors; personal factors such as the demographic, education, skills, attitudes, and personal lifestyle; and household food management such as cooking, storing, and preparing food (Canali, 2017; Spang et al., 2019).

Food supply designs are thus significantly impacted by sociodemographic variables like gender and work status, which might ultimately result in food waste. Studies indicate that these variables influence attitudes and actions related to food management. Research indicates that some demographic variables, such as gender and size of household, may be linked to increased food waste, but older age or employment are often related to lower food waste behavior (Grasso et al., 2019). It is important to understand these sociodemographic factors when creating focused interventions to reduce home consumption of food wastages.

Our aim is to answer the following key questions to build a comprehensive understanding of value chain food wastage: What is the link between household Food Wastage and sociodemographic characteristics? These findings can contribute to existing studies on the importance of sociodemographic factors in predicting food wastage behavior.

Background and Theoretical Framework

Food supply chain wastage and food loss

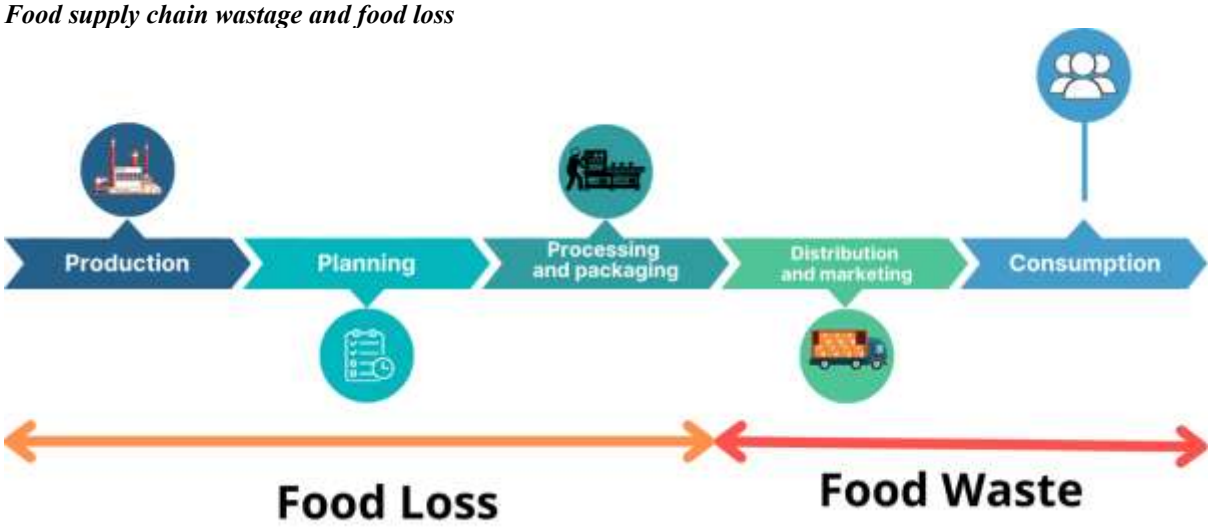

Figure 1 Food Supply Chain Wastege and Food Loss (Source: FLW Study Report in Indonesia by BAPPENAS, 2021(Diana et al., 2022))

Figure 1 outlines the stages of the production, post-harvest, storage, processing and packaging supply chain, which is the upstream agribusiness subsystem of the agricultural agribusiness subsystem. In the meantime, the distribution, marketing, and consuming supply chain phases of the lower agribusiness subsystem are where the food waste phenomenon takes place. Issues of food waste at the consumption supply chain level, particularly household consumption, are the main topic of this study.

Socio-Demographics

Type of age ('Z': 10-24 years old), ' Millennials' (25-39 years old), "Gen X" (40-54 years old), and "(55-74) years old); " Sex (female; male); " Education (" primary school, junior high school, senior high school, bachelor's degree, master's degree, and doctoral degree); " Profession (housewife, contract worker, private employee, retired, civil servant, and self-employed); " Net household income per month divided into three categories: below Rp500. 000, between Indonesian rupiah 500,000 and Indonesian rupiah 1,500,000, and above Indonesian rupiah 2,500,000.

Food wastage caused by households

Our largest amount of food waste comes from activities that occur downstream of the food value chain, particularly in the context of consumer interactions with retail, food service and households. "Sources of food and beverages that have been consumed within the home include retail and contributions from home-grown and takeaway food," according to the domestic food waste definition. The Food and Agriculture Organization of the United Nations (FAO) reports that more than 30% of waste is the result of consumer behavior, while less than 10% happens at the point of distribution in Europe.

Table 1 See below for a list of possible causes of food waste in homes (Zhao et al., 2019):

Item	A probable cause for generating food wastege
Planning	1. No planning and food shopping 2. Weak communication between household members
Shopping	1. Flavor wise, it's quite different 2. Shortage of time 3. Packaging that is too large
Storing	Appropriate and non-systematic stocking exercises
Cooking	1. Appetite for ready-to-eat food 2. Overly rigorous food preparation
Eating	1. Eating patterns that are unpredictable 2. Dine in a restaurant 3. Big plate size
Managing leftovers	1. The urge for variety in food 2. Knowledge of food waste is lacking
Assessing edibility	1. Confusion about date tags 2. Belief in food expiries and how to prolong them
Disposal/ Redistribution	Less asocial acceptance to share our meal

Source: (Zhao et al., 2019)

Food Waste Prevention Strategies

Table 2 below lists potential food waste prevention strategies connected to altering consumers' food waste behaviors (Zhao et al., 2019):

Table 2 potential food waste prevention strategies connected

Item	**Possible prevention measures**
Planning	1. Use of shopping list 2. Household member communication...
Shopping	1. Improve the frequency of shopping
Storing	1. Systematic storage and categorization 2. Thawing food
Cooking	1. Higher cooking frequency 2. Precise and precise portion size estimate...
Eating	1. Other family items with dietary restrictions
Managing leftovers	1. Re-using the leftovers
Assessing edibility	1. Assessment of food palatability
Disposal/ Redistribution	1. Giving leftovers to pets 2. The recycles and composts waste
Information and knowledge sharing	1. household food waste eco-value campaign 2. Booklet on food waste...

Source: (Zhao et al., 2019)

Research Hypotheses

The research aimed to investigate potential causes of food waste in their homes. After that, he looked at ways to prevent food waste that might be connected to adjustments in the food waste habits of consumers. The ultimate goal is to assess the sociodemographic relationship between potential causes of food wastage at home and food wastage reduction efforts related to changes within consumers' waste disposal behavior. Figure 2 depicts the conceptual model created for this investigation. The following hypothesis was evaluated with the model using the structural equation modeling (SEM) technique. Thus:

- **Hypothesis (H1).** *The demographic characteristics and factors impacting the frequency of food waste are positively and significantly correlated.*
- **Hypothesis (H2).** *The way that households handle food waste and their demographics are positively and significantly correlated.*

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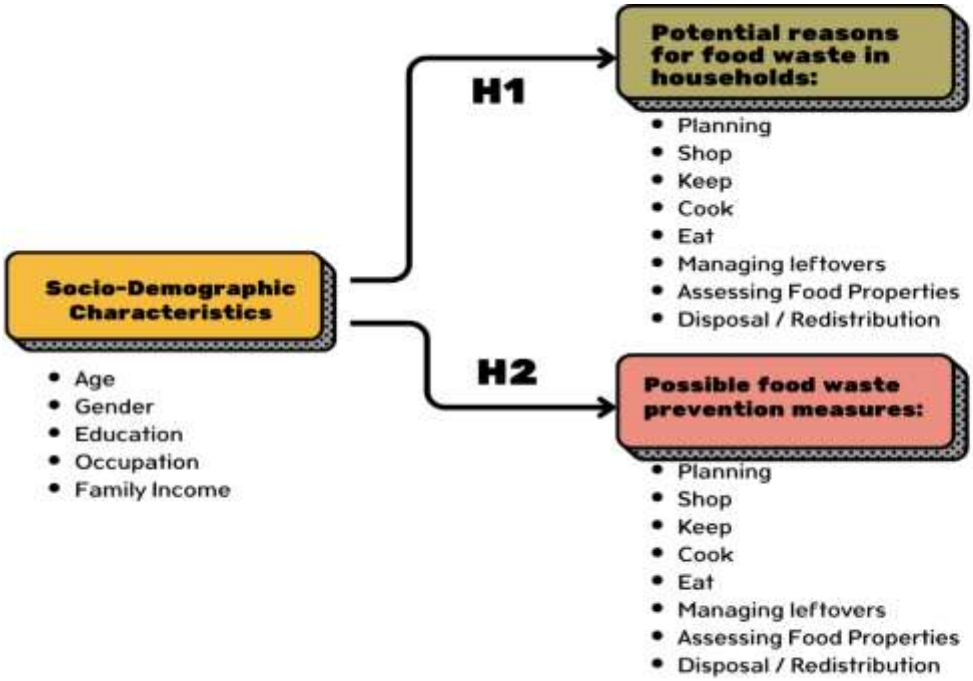

Figure 2. Conceptual model of the links between socio-demographic characteristics and food waste in the household food value chain

METHOD

Results from a larger study on waste prevention, which was divided into two parts- one on household activities to prevent food waste and another on food wasting behavior- were analyzed and reported in this paper.

Sample and Data Collection

The structured questionnaire was utilized to gather the study's dataset. Family members of Padang city inhabitants between the ages of 18 and 75 who play roles such as father, mother, and child in their separate households were the target audience for the study. After being made aware of the goal of the research and the confidentiality of the information, the participants were invited to complete a questionnaire. The survey was carried out in 2023, between February and December.

A practical sample of three hundred respondents. The recruitment approach is predicated on the involvement of individuals who are readily available, highly accessible, and prepared to take part in surveys voluntarily without receiving anything. Convenience sampling is not, however, seen as a disadvantage in this kind of research, as long as the responses exhibit enough variation across the variables under investigation (Kritikou et al., 2021). Finding connections between model variables, rather than estimating population parameters, is the aim.

The Questionnaire

The 35-question section of a longer and more structured questionnaire on potential causes of food waste generation and potential preventive measures based on the model shown in Figure 2 served as the main instrument of the survey section provided here. Appendix A contains the questions (observed variables) and the model variables (latent variables) they measure. Unless otherwise specified, all observed variables are measured using a 5-point Likert scale. The Likert scale has categories that run from “strongly disagree (1)” to “strongly agree (5)” and from “never (1)” to “always (5),” depending on the topic.

Statistical Analysis—Structural Equation Model (SEM)

SMART PLS 4 analysis software is utilized to perform Structure Equation Modeling (SEM) analysis on the collected data. SEM, or path analysis, was chosen as a suitable instrument for the evaluation of this research model (Figure 2). SEM is a multivariate statistical method widely used by behavioral scientists. By using latent variables as dependent variables or explanatory variables in this study, SEM allows simultaneous modeling of multiple relationships. The latent variables (such as attitudes, social pressure, emotions, etc.) are inferred from other variables that are observable and cannot be measured directly. A relational hypothesis can be tested with SEM, which cannot be done with conventional data analysis techniques. The measurement model and the structural model form the SEM model. Both the measurement model and the structural model form the SEM model. A set of latent (unobserved) variables is represented by a set of observed variables in the first instance. This is done by explaining the correlation between observed and unobserved variables in the measurement model. However, according to (Kritikou et al., 2021), the second is a scheme that explains the relationship between latent variables.

RESULT

Sociodemographic Characteristics of the Respondent Population of the Survey
There were 300 respondents in the sample (Table 3). The purpose of this survey is to investigate the issue of wasted food in Padang City households.
Table 3. Sample sociodemographic characteristics

Indicator	**Persentase (%)**
Age	
Gen Z: age 10 to 24 year	8,67
Millennials: ages 25 to 39	45,00
Gen X: ages 40 to 54	34,00
Baby Boomer: ages 55 to 74	12,33
Total	100,00
Sex	
Man	44,00
Woman	56,00
Total	100,00
Education	
Elementary school	10,00
middle school	9,00
high school	55,33
3-year diploma	3,67
bachelor's degree	14,33
master's degree	7,67
Total	100,00
Work	
Housewife	42,33
Contract worker	30,00
Private employees	3,33
Rerired	1,00
public servant	9,00
entrepreneur	14,33
Total	100,00
Revenue / Income per month	
≤ 500.000 IDR	8,33
> 500.000 to 1.500.000 IDR	59,67
> 1.500.000 to 2.500.000 IDR	14,33
2.500.000 IDR and Above	17,67

Source: analyzed by the author from the data collected
Table 3 shows that women are the majority of respondents—56 percent of the total. Most respondents (45% of whom are millennials) are between the ages of 25 and 39. Most people have a high school education (55.33%), 42.33% work as housewives, and 59.67% make between IDR 500,000 and IDR 1,500,000.

Relationship Between socio-demographic characteristics and food waste in the food value chain in households
The two analyses used in SEM-PLS analysis are the measurement model analysis (outer models) and the structure model analysis (inner model).

Results of Evaluation of the Measurement Model (Outer Model)

The SEM-PLS Smart 4.0 tool is used in this study to process data. A CSV (Comma-Separated Values) data tabulation assigns a value of 1 to the respondent's data. This data must be analyzed to determine the model's structure, loading factor, and relevance for each latent variable. Rerunning the data makes sure that, when utilizing SEM-PLS for data processing, the validity and reliability criteria are met. The three metrics used to assess the validity of the outer model are converging. The measures of validity are discriminatory validity and composite validity.

(Chin & Newsted, 1998) An indicator loading factor is considered valid and reliable if the correlation value is higher than 0.7. The indicator should be removed from the model, and the data processing (running data) should be repeated if the result is not greater than 0.7, in which case the indicator is considered invalid.

The first stage of SEM-PLS data processing:

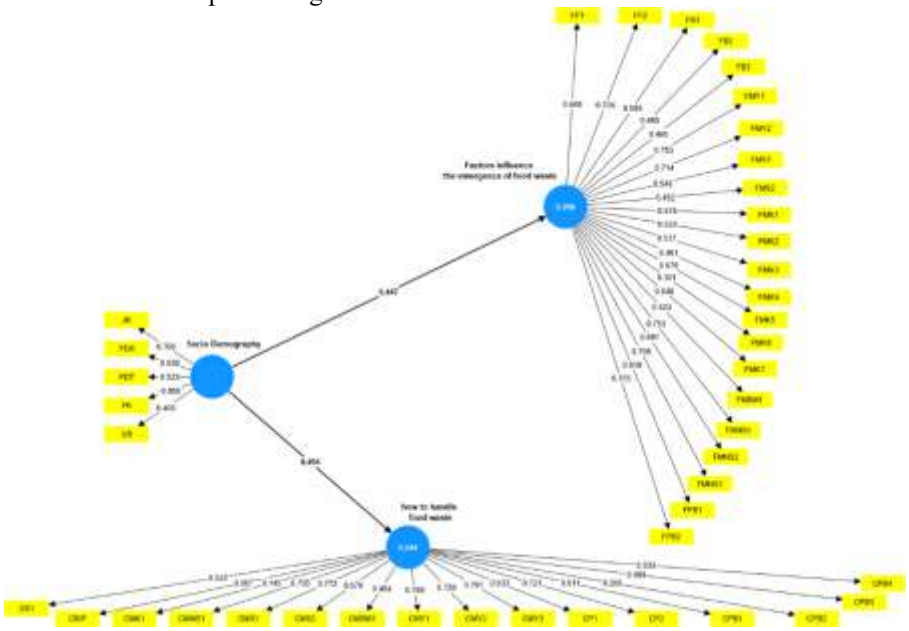

Figure 3. Results of Stage 1 SEM-PLS

Table 4. Outer Loading value on SEM-PLS Phase 1 data processing

	Control and food waste	A Factor's Influence Available on Food Waste	Socio Demography
US			0.406
PK			-0.050
PDT			0.523
PDK			0.639
JK			0.766
FPB2		0.355	
FPB1		0.619	
FP2		0.704	
FP1		0.600	
FMY2		0.714	
FMY1		0.753	
FMSM1		0.523	
FMS2		0.452	
FMS1		0.548	
FMNS3		0.705	
FMNS2		0.697	
FMNS1		0.753	
FMK7		0.648	

FMK6		0.301	
FMK5		0.670	
FMK4		0.461	
FMK3		0.537	
FMK2		0.529	
FMK1		0.578	
FB3		0.465	
FB2		0.489	
FB1		0.586	
CPB4	0.033		
CPB3	0.089		
CPB2	0.268		
CPB1	0.611		
CP2	0.721		
CP1	0.633		
CMY3	0.761		
CMY2	0.720		
CMY1	0.760		
CMSM1	0.454		
CMS2	0.579		
CMS1	0.772		
CMNS1	0.755		
CMK1	0.145		
CBIP	0.067		
CB1	0.522		

Source: Processed SEM-PLS Phase 1 data

The result of the SEM-PLS Stage 1 data processing, shown in Figure 3 and Table 4 above found several invalid indicators. Indicators with low loading factor values also show low contribution, so they need to be removed and data processing is done again. As a result of the data analysis conducted in step 2, the model and data are listed below:

SEM-PLS Phase 2 data processing

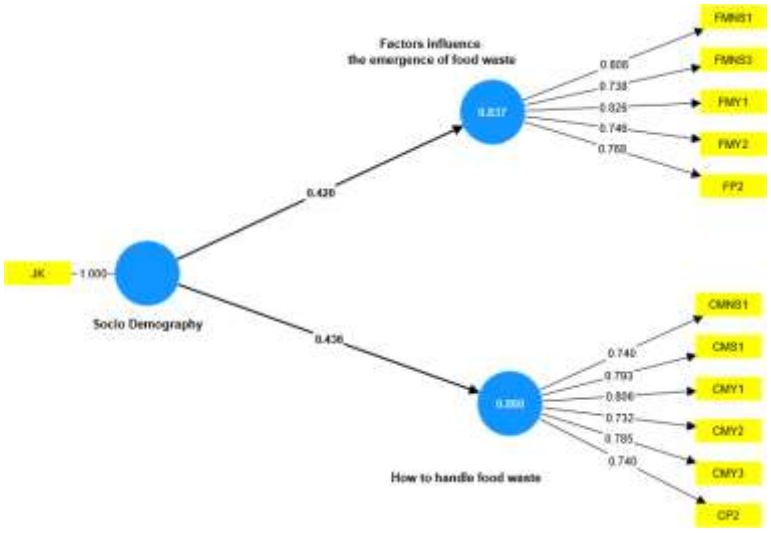

Figure 4. Results of Stage 2 SEM-PLS

Table 5. SEM PLS Phase 2 Outer Loading Value Data

	Control and food waste	A Factor's Influence Available on Food Waste	Socio Demography
CMNS 1	0.740		
CMS1	0.793		
CMY1	0.806		
CMY2	0.732		
CMY3	0.785		
CP2	0.740		
FMNS1		0.808	
FMNS3		0.738	
FMY1		0.826	
FMY2		0.746	
FP2		0.768	
JK			1.000

Source: Processed data for SEM-PLS Phase 2.

For the result of using data for SEM-PLS Phase 2, it is shown in Figure 4 and Table 5 above. Each indication is considered valid or qualified if the loading factor value is above 0.5. The average variance value extracted, or AVE, can be used to evaluate how well the latent variable scores reproduce the original information scores and also the factor loading values. Mean variance extracted, or AVE, values can be used to evaluate how well the latent variable scores reproduce the original information scores as well as the factor loading values.The capacity of the AVE value to convey the value of the indicator used to score the latent variable increases as it increases. The minimum AVE value is also 0.50, indicating a high level of convergent validity with an AVE cut-off value of 0.50. This indicates that the likelihood of indicators converging and entering a construct with a block value is greater than 50% because the likelihood of indicators in one build entering another variable is smaller (less than 0.50). After processing the SEM-PLS phase 2 data, the outcome is as follows:

Table 6. AVE value in SEM-PLS Stage 2 data processing

	Average variance extracted (AVE)
Control and food waste	0.587
A Factor's Influence Available on Food Waste	0.605

Table 6 shows that the AVE value for each variable provided by the SEM-PLS process in stage 2 testing is considered very good as it is above the required minimum of 0.5. This indicates that more than 50% of the volatility in the indicators can be attributed to hidden causes. This indicates that each indicator and construct in the model has met the requirements of the convergent validity test, according to the Table.

The following is the loading and cross-loading value of SEM-PLS stage 2 data processing:

Table 7. Loading Factor dan Cross Loading

	Control and food waste	A Factor's Influence Available on Food Waste	SOCIO DEMOGRAPHY
CMNS 1	0.740	0.622	0.318
CMS1	0.793	0.610	0.369
CMY1	0.806	0.826	0.345
CMY2	0.732	0.746	0.259
CMY3	0.785	0.629	0.343
CP2	0.740	0.768	0.353
FMNS 1	0.720	0.808	0.350
FMNS 3	0.535	0.738	0.309
FMY1	0.806	0.826	0.345
FMY2	0.732	0.746	0.259

FP2	0.740	0.768	0.353
JK	0.436	0.420	1.000

It is also considered authentic if its factor loadings exceed its cross-loading values. Table 7 shows that the construct correlations of all load values are greater than the cross-load values. next, assess discriminant validity. The model is considered to have adequate discriminant validity if the root of the AVE for each construct is greater than the correlation between that construct and the other constructs, as shown in Table 8.

Table 8. Discriminant Validity Value

	Control and food waste	**A Factor's Influence Available on Food Waste**	**Socio Demography**
Control and food waste	0.766		
A Factor's Influence Available on Food Waste	0.910	0.778	
Socio Demography	0.436	0.420	1.000

Source: Processed SEM-PLS Phase 2 data

It is also worth noting that the root AVE values for each cluster are all significantly higher than the Pearson correlations between the different clients, as seen in Table 8 above. Therefore, Tables 7 and 8 show that each construct in the estimated model meets the criteria of the discriminant validity test. The final stage in analyzing the outer model is to complete the composite reliability test. In general, Cronbach's alpha is a lower bound estimate when assessing reliability. Composite reliability is read in the same way as Cronbach's alpha, with cutoff values of 0.7 and higher considered acceptable (Hair et al., 2014). Stage 2 SEM-PLS data processing results for composite reliability with Cronbach's alpha are listed below:

Table 9. Composite Reliability and Cronbach Alpha values

	Cronbach's alpha	**Composite reliability (rho_a)**
Control and food waste	0.860	0.864
A Factor's Influence Available on Food Waste	0.837	0.843

Source: Processed data from SEM-PLS Phase 2.

Table 9 shows that the research model is considered reliable due to the fact that all variable values for composite reliability and Cronbach's alpha are greater than 0.7. It could be stated that the four variables have reliable reliability as they passed the composite reliability test.

Results of Evaluation of the Structural Model (Inner Model)

The inner model is a systematic model for predicting causal relationships between latent variables. Through the bootstrapping process, a benchmark T-statistic is obtained to guess the existence of a causal relationship. This function is akin to that of R2 in linear regression. "The criteria for limiting the value of R2 are in three categories, namely 0.67 as substantial, 0.33 as moderate, and 0.19 as weak." (Chin & Newsted, 1998). Changes in the value of R2 are used to determine if testing external latent factors on internal latent variables has a substantial effect. The stage 2 SEM-PLS analysis results were used to generate the R2 value, which is as follows:

Table 10. R Square Value

	R Square
A Factor's Influence Available on Food Waste	0.176
Control and food waste	0.190

Source: Processed data from SEM-PLS Phase 2.

Table 10 shows that the contributing construct element is 0.176, or 17.6%, and that the remaining 82.4% of the explanation is due to other variables not included in the research model. The figure also shows that the concept of coping mechanisms can be described by 0.190, or 19.0%, with components outside the scope of the study model accounting for the remaining 81.0% of its explanation.

Hypothesis Testing

The next analysis carried out on the inner model is hypothesis testing. In this t-statistic test, the t-statistic value must be> 1.96 in order to qualify the hypothesis as accepted.

Table 11. Hypothesis Testing Results

	Original sample (O)	**T statistik (|O/STDEV|)**	**Conclusion**

SOCIO DEMOGRAPHY -> A Factor's Influence Available on Food Waste	0.420	8.869	The results are substantial and show a positive effect, so the hypothesis is accepted.
SOCIO DEMOGRAPHY -> Control and food waste	0.436	9.344	The results are substantial and show a positive effect, so the hypothesis is accepted.

DISCUSSIONS

Sex, employment status, and family income are identified as simple behavioral predictors of food wastage. In this study, the likely cause of food wastage in households was strongly influenced by inadequate communication between household members (planning), inappropriate and unsystematic storage practices (storing), insufficient knowledge of food shelf-life and how to extend it (assessing eatability), and lack of social acceptance for sharing food (disposal or redistribution). In this case study, possible food waste prevention measures are to change consumers' food waste behavior through communication with household members... (planning), inappropriate and unsystematic storage and grouping, freezing of food (storage), more frequent cooking, and better assessment of edibility.

The authors' previous research results, which underline the importance of home practices related to meal preparation and planning in the creation of food waste, are corroborated by the findings of this study, which are related to the lack of interaction among household members. The study by (Aloysius et al., 2023) emphasizes how poor coordination and planning can often lead to food loss during meal planning, which should be avoided. (Vittuari et al., 2023) highlighted that families who budget and communicate well also typically save money and experience less stress related to eating. Families with good communication about preferences and meal plans tend to have more varied and enjoyable eating patterns, which keeps mealtimes interesting and engaging for all members (Zamri et al., 2020). This fosters collaboration and a sense of responsibility among family members. Research conducted by (Aloysius et al., 2023; Vittuari et al., 2023; Zamri et al., 2020) all emphasize how important communication is to build a peaceful and healthy household environment through well-thought-out meals. Additionally, lack of communication can lead to increased food waste

The findings of this study relate to that inappropriate and unsystematic storage practices do play an important role in contributing to food waste. Research from various studies supports this claim by highlighting the impact of storage parameters on food spoilage and staling processes, leading to increased waste (El Bilali & Ben Hassen, 2020). Therefore, addressing and improving storage practices at the household level can contribute significantly to reducing overall food waste. (Bajželj et al., 2020)

The findings from this study are related to the general knowledge of food shelf life and how to extend it. In line with research conducted by Wageningen University in the Netherlands, better knowledge of food storage methods can extend shelf life by up to two times for some food products (Filimonau et al., 2020). The European Commission on Food Safety reports that consumers in the European Union are often confused by the various date labels on food products, which contributes to food waste (Eriksson et al., 2020). Another study also found that confusion regarding date labels on food is a major cause of food waste in households. Confusion about shelf life also occurs in Australians; there is about 20% of food wasted due to confusion about shelf life (Brennan et al., 2021).

The findings from this study are related to the knowledge of food shelf life and how to extend it. In line with research conducted by Wageningen University in the Netherlands, better knowledge of food storage methods can extend shelf life by up to two times for some food products (Filimonau et al., 2020). Confusion about shelf life also occurs in Australians; about 20% of food is wasted due to confusion about shelf life. (Brennan et al., 2021). Other studies have also found that confusion regarding date labels on food is a major cause of food waste in food households (Eriksson et al., 2020).

The research findings regarding the lack of social acceptance of food sharing are in line with other researchers' findings that many people are reluctant to share food due to concerns about food safety and quality. Factors such as mistrust of food donors and concerns about potential contamination are often key barriers. (Zanetta et al., 2022) reported that cultural and social norms strongly influence the acceptability of food sharing. In many societies, sharing food is seen as a sign of weakness or incompetence, which can bring shame to the recipient. Donors fear possible legal liability in the event of health problems resulting from the distributed food. In some cultures, accepting food from strangers can be considered rude or embarrassing (Meijer et al., 2021).

CONCLUSION

Of the three externally generated latent variables, the sociodemographic factor (X1) has the most influence on the causal factors of food wastage (Y1) and the strategies to avoid food wastage in households (Y2), in accordance with the results of the research on how these factors influence food wastage behavior in households in Padang

City. In Padang City, household food waste behavior was largely predicted by gender, occupational position and family income. These results confirm the current understanding that sociodemographic characteristics are direct indicators of FWB. Since the sociodemographic approach can be used for behavioral interventions and strategies need to be designed to minimize food waste behavior at home connected to these sociodemographic parameters, this study contributes to strategies to reduce food waste at the city level.

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Appendix A
Table A1. Observed and latent variables of the questionnaire

Latent Variables	**Observed Variables**
Socio- Demography	
- Age	US: (Gen Z: 10–24 years), Millennials (25–39 years), Gen X (40–54 years), and Baby Boomers (55–74 years).
- Gender	JK: Male or Female
- Education	PDK: Schooling (elementary school, middle school, high school, bachelor's degree, master's degree, and doctoral degree);
- Occupation	PK: (housewife, contract worker, private employee, retiree, public servant, and business owner);
- Income	PDT: below IDR 500.000, between IDR 500.000 and IDR 1.500.000, and beyond IDR 2.500.000.
Potential reasons for food waste generation	
Planning	FP1: No planning and food shopping FP2: Weak communication between household members
Shopping	FB1: Flavor wise, it's quite different FB2: Shortage of time FB3: Packaging that is too large
Storing	FMY1: Appropriate stocking exercises FMY2: non-systematic stocking exercises
Cooking	FMS1: Appetite for ready-to-eat food FMS2: Overly rigorous food preparation
Eating	FMK1: Eating patterns that are unpredictable FMK2: Dine in a restaurant FMK3: Big plate size
Managing leftovers	FMSM1: The urge for variety in food FMSM2: Knowledge of food waste is lacking
Assessing edibility	FMNS1: Perplexity about date labels FMNS2: Confusion about date tags FMNS3: Belief in food expiries and how to prolong them
Disposal/ Redistribution	FPB1: Give food that is still worth eating to neighbors FPB2: Asocial acceptance of sharing food is lacking
Possible prevention measures	
Planning	CP1: Use of shopping list CP2: Household member communication...
Shopping	CB1: Improve the frequency of shopping
Storing	CMY1: Systematic storage CMY2: Categorization storage CMY3: Thawing food
Cooking	CMS1: Higher cooking frequency CMS2: Proper estimation of portion size...
Eating	CMK1: Family member with special diet
Managing leftovers	CMSM1: Re-using leftovers
Assessing edibility	CMNS1: Greater nuanced assessment of food appropriateness
Disposal/ Redistribution	CPB1: Giving leftovers to pets CPB2: Waste recycling CPB3: Composting CPB4: Delivering food waste to the maggot's house

Information and knowledge sharing	CBIP: Booklet on food waste...

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