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Relationship between Food Preparation and Food Processing Behavior and Food Waste Behavior in Households in Tanah Sareal District

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ABSTRACT
This study aims to analyze the relationship between food preparation and processing behaviors with FWB in households in Tanah Sareal District, Bogor City. This research employs a quantitative approach with a cross-sectional design. The sample consists of 110 households selected based on specific criteria. Data were collected through interviews using a questionnaire covering respondent characteristics, food preparation behavior, food processing behavior, and FWB. Data analysis was conducted using correlation tests. The results indicate that the majority of respondents exhibit poor food preparation behavior (68%) and food processing behavior (63.6%). Additionally, 63.6% of respondents also demonstrated poor FWB. Correlation tests revealed a significant positive relationship between food preparation behavior and FWB ($p = 0.0001$, $r = 0.348$) as well as between food processing behavior and FWB ($p = 0.008$, $r = 0.252$). This study concludes that better food preparation and processing behaviors are associated with lower levels of food waste in households. Therefore, education and interventions on household food management should be enhanced to reduce food waste and its negative environmental, economic, and social impacts.

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INTRODUCTION

A 2021 study by Bappenas revealed that Indonesia discarded between 23 and 48 million tons of food waste annually from 2000 to 2019, translating to 115-184 kg per person each year. Even based on data from the Ministry of Environment and Forestry in 2018, FW in Indonesia has reached 300 kg/capita/year, making it the third largest FW producer in the world. If not controlled, it is estimated that Indonesia's FW generation in 2045 could reach 344 kg/capita/year. Furthermore, looking again at the data from the Ministry of Environment and Forestry (KLHK) in 2022, the percentage of food waste continues to increase from 2019-2022, which was previously only 20% then increased to 40%. Among all types of waste that are processed, food waste is the most abundant waste component, reaching 40.9% of the total waste and it was also found that the most common waste source was from the household sector, reaching 39.3%.

The importance of reducing food waste to reduce negative environmental, economic and social consequences, with the majority of food waste originating from households. Reducing FWB can be started from the household level by implementing household food management which includes planning, shopping, storing, processing and handling leftover food. From all over the world, most FW occurs at the consumer level, especially in households. In this case, food that is not properly considered such as not shopping according to meal planning, food ingredients stored too long in the refrigerator, not paying attention to existing food ingredients and stored too long so that they are past their expiration date (expired), cooking in large quantities so that it can cause food left on the plate and not reprocessing leftover food. Based on the background description, FWB causes several impacts on the alleviation of hunger and poverty, decreased nutritional status, and environmental losses. The largest source of FW contributors comes from households. Therefore, researchers are interested in analyzing the relationship between food planning behavior classified into food prep behavior (menu planning, shopping routines, storage) and processing behavior (processing, handling leftover food) in households in Tanah Sareal District, Bogor City.

LITERATURE REVIEW

The conceptual framework adapted from studies by Vanka J, 2022; Chaerul M and Zatadini, 2020; and Adventus, et al (2019). Psychological approaches, including behavior, socio-demographic factors, and routines and practices related to food planning, were identified as factors influencing the increase in food waste generation. Subsequently, prevention and reduction strategies for food waste can be determined based on these identified factors.

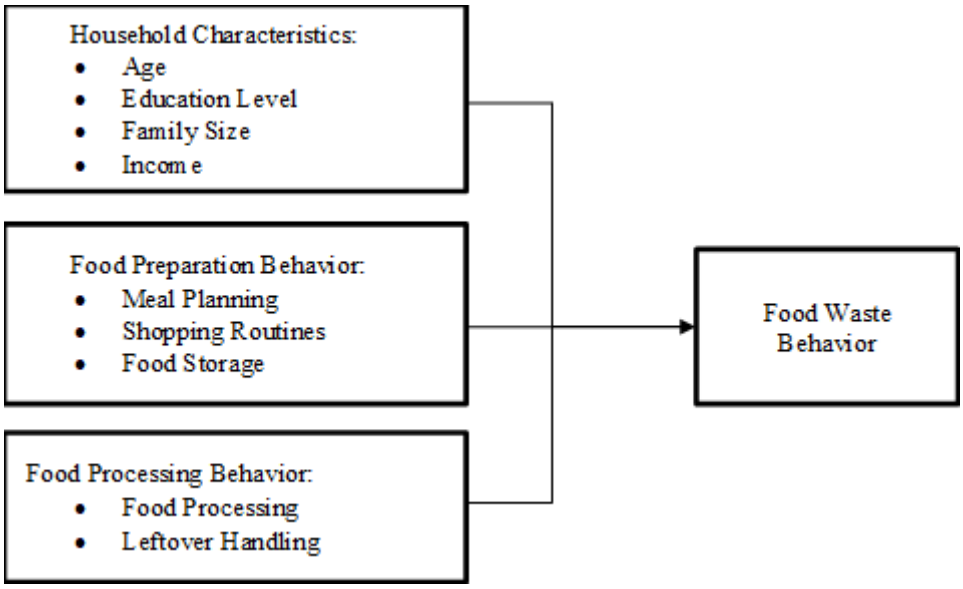

Figure 1. Conceptual Framework

Factors contributing to Food Waste Behavior (FWB) within household food planning include menu planning, shopping routines, storage, food processing, and leftover management. Household food planning behavior is categorized into two variables: food preparation (planning, shopping routines, storage) and food processing (processing and leftover management). Households are significant contributors to food waste, and their characteristics, such as respondent age, education level, family size, and household income, influence FWB.

Research Hypothesis

Hypothesis 1:

a. (Ho): There is no relationship between food preparation behavior and food waste behavior in Tanah Sareal District, Bogor.
b. (Ha): There is a relationship between food preparation behavior and food waste behavior in Tanah Sareal District, Bogor.

Hypothesis 2:

a. (Ho): There is no relationship between food processing behavior and food waste behavior in Tanah Sareal District, Bogor.
b. (Ha): There is a relationship between food processing behavior and food waste behavior in Tanah Sareal District, Bogor.

METHODOLOGY

The study was conducted in Tanah Sareal District, Bogor City, West Java, starting in May 2023 for preparation, while the implementation began in December 2023. This type of research includes correlation analytical research with a quantitative approach and cross-sectional design (Cross Sectional Study).

The population in this study were all households in the Tanah Sareal District area, Bogor City, consisting of 64,192 families (Tanah Sareal in Figures, 2021). The sample in this study was 110 households in Tanah Sareal District, Bogor City which were the same as the population and were taken in a certain

way so that they could represent the population. It has the following inclusion criteria, namely households that manage their food independently, households that have a refrigerator (refrigerator), households that have lived for ± 6 months in Tanah Sareal District, housewives who can communicate well, housewives who are willing to participate in the study until completion, housewives aged 30-55 years. Data collection in this study through questionnaire interviews in the form of respondent characteristics, food prep behavior, food processing behavior data and respondent FWB data to see the relationship between independent variable behavior and dependent variables. Data analysis techniques using correlation tests.

RESEARCH RESULT

Based on the analysis of the data obtained, the characteristics of the respondents included age, length of education, number of family members and household income. The percentage of female respondents in this study was 100%. This is because the willingness to be interviewed and knowledge about household food management behavior are widely known by women. In the age variable from a total of 110 respondents, it can be seen that the average age of respondents is 37 years and the standard error is 0.62 years with the lowest age of 30 years and the highest age of 55 years. In the variable of length of education from a total of 110 respondents, it can be seen that the average length of education of respondents is 12 years and the standard deviation is 3.1 years with the lowest length of education of 0 years and the highest length of education of 16 years. In the variable of the number of family members from a total of 110 respondents, it can be seen that the average number of family members is 4 people and the standard error is 0.11 people with the lowest number of family members being 2 people and the highest number of family members being 9 people. In the household income variable, from a total of 110 respondents, it can be seen that the average household income is IDR 4,000,000 per month and a standard error of IDR 115,471 per month with the lowest household income of IDR 400,000 per month and the highest household income of IDR 4,813,988 per month.

Furthermore, the existing food prep behavior score is made into a percentage by dividing the score obtained by the respondent by the maximum score from the existing questions, then multiplied by 100%. The following is a table of the frequency distribution of food prep behavior from 110 respondents.

Table 1 Frequency Distribution of Food Preparation Behavior in Tanah Sareal District

Variabel	**n**	**%**
Food Preparation Behavior		
Poor (< 76%)	75	68%
Good (≥ 76%)	35	32%
Total	110	100%

Based on the table above, it can be seen that respondents with poor food prep behavior numbered 75 people (68%) and respondents with good food prep behavior numbered 35 people (32%). The average food prep behavior is at a score of 113.25 (72.6%). The results of this study are below the percentage of good behavior levels according to Arikunto 2013, which means that food preparation behavior in Tanah Sareal District is still not good.

Furthermore, the existing food processing behavior score is made into a percentage by dividing the score obtained by the respondents by the maximum score from the existing questions, then multiplied by 100%. The following is a table of frequency distribution of food processing behavior from 110 respondents.

Table 2 Frequency Distribution of Food Processing Behavior in Tanah Sareal District

Variable	**N**	**%**
Food Processing Behavior		
Poor (< 76%)	70	63,6%
Good (≥ 76%)	40	36,4%
Total	110	100%

Based on the table above, it can be seen that respondents with poor food processing behavior numbered 70 people (63.6%) and respondents with good food processing behavior numbered 40 people (36.4%). The average food processing behavior is at a score of 34.87 (72.7%). The results of this study tend to be below the percentage of good behavior levels according to Arikunto 2013, which means that food processing behavior in Tanah Sareal District is still not good.

Furthermore, the existing FWB score is converted into a percentage by dividing the score obtained by the respondent by the maximum score from the existing questions, then multiplied by 100%. The following is a table of FWB frequency distribution from 110 respondents.

Table 3 FWB Frequency Distribution in Tanah Sareal District

Variabel	**n**	**%**
Food Waste Behavior		
Poor (< 76%)	70	63,6%
Good (≥ 76%)	40	36,4%
Total	110	100%

Based on the table above, it can be seen that respondents with poor FWB numbered 70 people (63.6%) and respondents with good FWB numbered 40 people (36.4%). The average FWB is at a score of 132.77 (75%). The results of this

study tend to be below the percentage of good behavior according to Arikunto 2013, which means that FWB in Tanah Sareal District is still not good.

Bivariate analysis was conducted to see the relationship between food prep behavior and FWB in Households in Tanah Sareal District, Bogor City. The following are the results of the relationship analysis presented in the table below.

Table 4 Analysis of the Relationship between Food Preparation Behavior and Food Waste Behavior in Households in Tanah Sareal District

Variables		Food Waste Behavior (score)				Total		p-value	r
		Not enough		Good					
		n	%	n	%	n	%		
Food Preparation Behavior	< 76 (Less)	52	47.3%	23	20.9%	75	68.2%	0.0001*	0.348
	≥ 76 (Good)	18	16.4%	17	15.5%	35	31.8%		
	Total	70	63.6%	40	36.4%	110	100%		

Based on the results of the correlation test above, it can be concluded that there is a relationship between food prep behavior and FWB with a p-Value of 0.0001 ($p < 0.05$) and the strength value is 0.348, which means it has a sufficient and positive relationship. This states that respondents with low food prep behavior scores tend to have low FWB scores, just as respondents with high food prep behavior scores tend to have high FWB scores as well.

Furthermore, bivariate analysis was conducted to see the relationship between food processing behavior and FWB in Households in Tanah Sareal District, Bogor City. The following data from the results of the relationship analysis are presented in the Table below.

Table 5 Analysis of the Relationship between Food Processing Behavior and Food Waste Behavior in Households in Tanah Sareal District

Variables		Food Waste Behavior (score)				Total		p-value	r
		Not enough		Good					
		n	%	n	%	n	%		
Food Preparation Behavior	< 76 (Less)	52	47.3%	23	20.9%	75	68.2%	0.0001*	0.348
	≥ 76 (Good)	18	16.4%	17	15.5%	35	31.8%		
	Total	70	63.6%	40	36.4%	110	100%		

Based on the results of the correlation test above, it can be concluded that there is a relationship between food preparation behavior and FWB with a p-Value of 0.008 ($p < 0.05$) and its strength value is 0.252, which means that it has a sufficient and positive relationship. This states that respondents with low food preparation behavior scores tend to have low FWB scores, just as respondents with high food preparation behavior scores tend to have high FWB scores as well.

DISCUSSION

Based on the results of the analysis of the relationship between food prep behavior and FWB, it was obtained ($p < 0.05$) which means that there is a relationship between food prep behavior and FWB in households in Tanah Sareal District. The results of the analysis also produced a sufficient and positive relationship strength. So, it can be concluded that good food prep behavior will increase the individual's plan to reduce FW.

It can be seen that respondents with poor food prep behavior scores produce poor FWB. While respondents with good food prep behavior scores produce good FWB.

The results of the study are in line with research conducted by Lintang Larasati (2023) which states that good food preparation behavior, such as meal planning, making shopping lists, and proper food storage, can help reduce FW in households. Another study conducted by Kristin J. Kirkpatrick, et al. (2019) stated that effective meal planning and food preparation practices can help individuals and households to significantly reduce FW. This is also in line with research conducted by Lybaws et al (2024) which states that an effective strategy to reduce FW in urban areas is shopping planning, while in rural areas it is managing leftover food. Based on the results of the analysis of the relationship between food processing behavior and FWB ($p < 0.05$) which means that there is a relationship between food processing behavior and FWB in households in Tanah Sareal District. The results of the analysis also produced a sufficient and positive relationship strength. So, it can be concluded that the better the respondent's food processing behavior, the higher the individual's plan to reduce FW. The results of the study are in line with Hidayat et al (2020) for the results of the study showed that consumer eating behavior resulted in FW including eating habits, number of portions, food appearance, menu selection, and the influence of eating together affecting consumer FW. Other studies also state that inappropriate food production can produce piles of food waste which results in the waste of food that should still be consumed (Hermanu, 2022). The results of previous studies also stated that considering the portion of food for each family member has an effect on the emergence of food waste in the household (Liu et al., 2022)

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the research that has been conducted, the following conclusions can be drawn:

1. The characteristics of respondents were obtained with an average age of 37 years with an average length of education of 11 years or equivalent to high school/equivalent, an average number of family members of 4

people/household, an average household income of IDR 4,000,000/month.
2. The average score of food prep behavior of respondents in households in Tanah Sareal District is still not good.
3. The average score of food processing behavior of respondents in households in Tanah Sareal District is still not good.
4. The average score of food processing behavior of respondents in households in Tanah Sareal District is still not good.
5. The results of the correlation test state that there is a relationship between food prep behavior and FWB in households in Tanah Sareal District with a p-Value <0.05 and has a fairly positive relationship.
6. The results of the correlation test state that there is a relationship between food processing behavior and FWB in households in Tanah Sareal District with a p-Value <0.05 and the value has a sufficient relationship with a positive direction.

ADVANCED RESEARCH

The scope of this research was limited by a few factors that might influence the extent to which the results can be applied broadly. For one, the sample consisted of mothers with young children, resulting in occasional interruptions during the questionnaire. Secondly, the questionnaire was quite long, and the vocabulary had to be adjusted to suit the participants

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