

Research Article

# The Relationship Between Moral Values and Food Wasting Behavior Among Consumers at All-You-Can-Eat Restaurants

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## Abstract

The aim of this study is to investigate the relationship between moral values and the behavior of wasting food that is still fit for consumption. Two hypotheses were proposed. Hypothesis I suggests a negative relationship between moral values and the frequency of discarding edible food. Hypothesis II suggests a negative relationship between moral values and the amount of food waste produced. The research instrument used to measure food waste behavior was the Food Waste Behavior Scale (FWBS), which consists of 5 statements. The validity of the scale was tested using three professional judgments, resulting in a Content Validity Ratio (CVR) between 0.6 and 1.0. The reliability of the FWBS is 0.84. The instrument used to measure the amount of food waste produced involved creating a list of food waste categories along with their weights. These categories included carbohydrates, meat, dairy products, fruits, vegetables, and snacks. The responses were categorized into five ranges, from 1 to 4 tablespoons. The instrument used to measure moral judgment was the Moral Judgments of Food Wasting Behavior Scale, consisting of 6 items. The validity of this scale was tested with 38 students enrolled in an Environmental Psychology course. The validity coefficient ranged from 0.316 to 0.618, with a reliability coefficient of 0.738. The study involved 100 all-you-can-eat restaurant customers. Hypothesis testing results showed that for Hypothesis I,  $\rho = -0.281$ ,  $p = 0.002$ , and for Hypothesis II,  $\rho = -0.333$ ,  $p = 0.000$ . The discussion highlights several limitations of the study.

## Keywords

Food Waste Behavior, Moral Values, Restaurant

## 1. Introduction

In 2010, Indonesia ranked second globally, after China, in marine plastic waste production [13]. Despite various regulations and efforts to address this issue, waste continues to increase as the population grows. In 2016, Indonesia again ranked second, after Saudi Arabia, in food waste production. Among the food waste, there are also consumable leftovers.

The Food and Agriculture Organization (FAO) reports that one-third of the food produced globally (1.3 billion tons) is wasted every year. The majority of this food waste consists of fruits, vegetables, and tubers [18]. The United Nations Environment Program (UNEP) states that 17% of food is wasted annually, which amounts to 1.03 billion tons.

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Households account for 61% of food waste, while supermarkets and restaurants contribute 39% [12].

Why does food waste occur? Discarding consumable food is condemned by many cultures and religions because food is a basic human need. Therefore, wasting food, especially when it is still fit for consumption, is considered immoral. In China, discarding food is even proposed to be criminalized [14]. In France, food waste, particularly by supermarkets, is regulated by law, with fines of up to \$83,000 [9], approximately IDR 1.29 billion (as of September 2024 exchange rates). A study conducted in Taiwan and the United States with 571 and 483 participants, respectively, showed that religious beliefs prevent food waste because wasting food is seen as a sign of weak religious conviction [25].

In Indonesia, food waste is significant, with 10 million pieces of bread thrown away each week, equivalent to 292,000 tons of CO<sub>2</sub> emissions. This food waste is partly due to the lack of knowledge about proper food waste management. Many people dispose of food waste by giving it to livestock or sending it to landfills, and very few recycle food waste [23]. Indonesia ranks as the second-largest producer of food waste after Saudi Arabia, despite its position at 73rd out of 116 countries on the Global Hunger Index (GHI) in 2021. Furthermore, 40% of Indonesians suffer from malnutrition, while 10% are obese [3, 20].

## 2. Literature Review

One of the main contributors to food waste is consumer behavior, particularly in restaurants, where patrons often leave food on their plates even when it is still edible [27]. Food waste in Indonesian eateries amounts to 29,413 kg/day or 6,383 tons/year, with rice accounting for around 70% of the total food waste [26].

Ideally, consumers should not leave food uneaten at restaurants, as Indonesian children are taught from an early age to finish their meals. According to a traditional belief, leaving food on the plate leads to the death of chickens, which are highly valued in rural Indonesia. In the past, parents could not explain the difficulty of obtaining food, so they taught children that wasting food equaled wasting valuable resources, symbolized by the death of a chicken [8]. Despite this, many people continue to leave food uneaten, which ends up as waste. This issue is particularly prevalent in buffet-style restaurants.

Several reasons contribute to this behavior. Consumers may feel that taking leftover food home is impolite or violates restaurant policies. Some may feel embarrassed to take food home, fearing it implies they lack food at home. Others may leave food uneaten simply because they see others doing the same, particularly in a collectivist culture like Indonesia [6, 10]. Even when allowed, some consumers, especially men and younger individuals, may be reluctant to take food home due to a lack of skills to reuse leftovers. Additionally, some consumers may take more food than they can finish, leading

to food waste.

To mitigate this issue, restaurants could offer discounts and implement post-meal payment systems [6]. Another recommendation is to encourage customers to take smaller portions and add more if needed, rather than overloading their plates from the start.

Moral values, environmental concerns, and poor shopping habits also play a role in food waste behavior. Both at home and in restaurants, food waste is influenced by weak moral values and unplanned purchases [4, 15]. Research in the U.S. involving 276 restaurant customers found that careful meal planning is positively related to the tendency to take leftover food home [24]. Therefore, meal planning and moral values significantly influence food waste behavior.

Moral values are a set of principles and daily behaviors that become societal norms, often based on psychological factors shaped by evolution. In terms of food waste, individuals with strong moral values tend not to waste food. Those with weak moral values may justify wasting food, while individuals with high moral standards feel guilty about discarding edible food and recognize its impact on future food security [24, 15].

Given the importance of moral values in food waste behavior, this study examines the relationship between moral judgment and the tendency to waste consumable food at all-you-can-eat restaurants. The study aims to empirically test the correlation between moral values, the frequency of food waste, and the amount of food waste produced.

### *Hypotheses*

- 1) H1: There is a negative relationship between moral values and the frequency of discarding food still fit for consumption. The lower the moral values, the more frequently a person wastes food.
- 2) H2: There is a negative relationship between moral values and the amount of food waste produced. The lower the moral values, the more food is wasted.

## 3. Methodology

This quantitative study involves both dependent and independent variables. The dependent variable in this study is the behavior of discarding or leaving uneaten food that is still fit for consumption, while the independent variable is moral values.

The population in this study is undefined or uncertain in number. It consists of consumers at Restaurant X in Yogyakarta Indonesia, a buffet-style restaurant. This restaurant was selected for the study for three reasons:

- 1) Its proximity to several universities in Yogyakarta, making students and workers the primary consumer group, who tend to be more open to research participation.
- 2) It has a high rating based on Google Reviews, indicating good quality.
- 3) Consumer behavior at a buffet tends to reflect daily

behavior at home, especially when faced with food served buffet-style. At buffets, consumers often take more food than at non-buffet restaurants [10].

This study employs nonprobability sampling with purposive sampling. The sample consists of consumers who dine in at the restaurant. Consumers who order food online or for takeaway are excluded. Since the population size is unknown, the sample size is calculated using Cochran's formula [22], resulting in a sample size of 96.4, rounded up to 100 to ensure a representative sample.

The instruments used to measure respondents' behavior in discarding or leaving food consist of two scales [15]. The first is the FWBS, which measures one aspect—frequency of food waste behavior. The second scale involves self-reports on the amount of food waste generated. These two factors (frequency and amount of food waste) cannot be combined, as they are not always directly related. For instance, someone who rarely discards food might still waste a lot of food in a single instance, such as when cleaning out a fridge, while someone who often discards food may do so in smaller quantities. Nevertheless, both aspects can be explained by the individual's moral values regarding food waste.

The validity test for the FWBS involved three independent evaluators (professional judgment), yielding a CVR between 0.6 and 1.0 for all items, indicating validity [17, 19]. The scale's reliability for frequency was  $\alpha = 0.84$ , measured by two professional psychologists to ensure consistency of the items [15].

The instrument for measuring the amount of food waste produced involves a list of food waste categories along with their weight, including carbohydrates, meat, dairy products, fruits, vegetables, and baked goods. Response categories range from one to four tablespoons. Measurement is done in tablespoons, as respondents are not accustomed to gram measurements. Based on trials, the weight per tablespoon for each food waste type is as follows: 15 grams for carbohydrates, 10 grams for meat, 45 grams for dairy products, 15 grams for fruits, 5 grams for vegetables, and 15 grams for baked goods.

The scale used to measure moral values is a modified version of the Moral Judgments of Food Wasting Behavior Scale, which includes two moral aspects: internal orientation and external orientation [15]. The validity and reliability tests of this scale involved 38 respondents. Validity was assessed using the Corrected Item-Total Correlation, with correlation coefficients ranging from 0.316 to 0.618 for all items. The reliability coefficient was  $\alpha = 0.738$ .

## 4. Research Results

This study involves three demographic variables: gender, status (student or employee), and age (see Table 1).

**Table 1.** Respondent Demographic Variables.

Demographic Variable	Quantity
Gender	Female = 67; Male = 33
Age	18 – 31 years old
Status	Student = 67; Employee = 33

Source: Primary data from research

**Table 2.** Research Results.

Hypothesis	Result
Hipotesis 1	Rho = -0.281 with a significance level of 0.002 ( $p < 0.01$ )
Hipotesis 2	Rho = -0.333 with a significance level of 0.000 ( $p < 0.01$ ),
Additional Finding 1	$t = -0.923$ with $p = 0.358$ or $p > 0.05$ ,
Additional Finding 2	$t = 0.438$ with $p = 0.663$ or $p > 0.05$
Additional Finding 3	$t = -1.026$ with $p = 0.308$ or $p > 0.05$
Additional Finding 4	$t = 0.668$ with $p = 0.506$ or $p > 0.05$

Hypothesis testing was conducted using the non-parametric Spearman's rho test, as the data did not follow a normal distribution. The first hypothesis test showed a rho value of -0.281 with a significance level of 0.002 ( $p < 0.01$ ), indicating a significant negative relationship between moral judgment regarding food waste behavior and the frequency of discarding still-consumable food. The lower an individual's moral values, the more frequently they discard food. The second hypothesis test showed a rho value of -0.333 with a significance level of 0.000 ( $p < 0.01$ ), indicating a very significant negative relationship between moral judgment on food waste behavior and the amount of food waste produced. This suggests that individuals with lower moral values tend to discard more food (see Table 2).

The study also found no significant differences in food waste behavior between female and male consumers ( $t = -0.923$ ,  $p = 0.358$  or  $p > 0.05$ ), nor between students and employees ( $t = 0.438$ ,  $p = 0.663$  or  $p > 0.05$ ). Similarly, there were no differences in the amount of food waste produced between genders ( $t = -1.026$ ,  $p = 0.308$  or  $p > 0.05$ ), or between students and employees ( $t = 0.668$ ,  $p = 0.506$  or  $p > 0.05$ ). This suggests that gender and respondent status (student or employee) do not significantly affect food waste behavior or the amount of food waste produced.

## 5. Discussion

Both hypotheses in this study were accepted, indicating that

moral values have a strong influence on food waste behavior and the amount of food discarded. Individuals with strong moral values experience guilt and anxiety when discarding food still fit for consumption. They also consider the negative impact of such behavior on the availability of food for future generations [4]. These individuals tend to reduce food waste production. Avoiding the disposal of still-consumable food and minimizing food waste reflect a strong external moral influence. Respondents in this study, mostly students and employees, tend to buy food rather than cook it themselves, due to limited kitchen facilities in their rented accommodations. They also feel little need to cook as they are unmarried, consistent with findings from a study in Brazil involving 525 students, which showed that students tend to be less skilled at cooking and prefer ordering fast food through online services [5]. Therefore, they tend to leave less food uneaten.

The lack of significant differences in food waste behavior between female and male consumers is noteworthy. Women are often considered more sensitive to environmental issues and more likely to be environmental heroes [21]. However, this study found no significant differences between genders in food waste behavior or the amount of food discarded. This could be explained by the fact that many respondents were unmarried, similar to findings in a study in Malaysia involving 111 students [7].

## 6. Conclusion

This study concludes that the moral values of students and employees have a strong influence on their behavior regarding food waste, particularly in leaving food that is still edible. The research was conducted at an all-you-can-eat restaurant. This study has three limitations. First, it focuses solely on buffet-style restaurants, where consumers are generally responsible for consuming the food, they take. This may differ from restaurants that serve food based on orders. Second, the study examines only popular foods in Yogyakarta, without considering foods from other cultures. Third, the study focuses only on organic food waste and does not account for packaging waste. Future research should consider including restaurants with à la carte menus, a broader range of food types, and packaging waste, which is also a significant environmental issue.

## Abbreviations

CVR	Content Validity Ratio
CO <sub>2</sub>	Carbon Dioxide
FAO	Food and Agriculture Organization
FWBS	Food Waste Behavior Scale
GHI	Global Hunger Index
IDR	Indonesian Rupiah (Indonesian Currency)
UNEP	United Nations Environment Program

## Conflicts of Interest

The authors declare no conflicts of interest.

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