



Economic And Nutritional Losses Result From Household Food Waste Behavior In The Special Region Of Yogyakarta

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Abstract. Food waste behavior on a household scale is food waste that occurs when food is wasted. This research aims to determine economic and nutritional losses due to food waste in the Special Region of Yogyakarta. The economic calculation is calculated by multiplying the amount of rice wasted by the average price of rice in the Special Region of Yogyakarta, namely Rp. 3,000. Meanwhile, energy and carbohydrate losses are calculated using *nutrisurvey2007*. The research results show that economic and nutritional losses due to wasted food per month at the household level in the Special Region of Yogyakarta are an average of IDR. 17,586 per month, energy loss of 970 kcal and carbohydrate loss of 211 grams. The implication is that there needs to be efforts to increase awareness at the household scale regarding wise food management, menu planning, correct food storage, utilization of leftover food, and understanding expiration dates.

Keywords: economic loss, food waste, loss of nutrition, rice

1 Introduction

Food waste behavior is a series of behaviors that result in the disposal of edible food that should be consumed or reused. One-third of all food produced globally is predicted to go to waste or be spilled, losing quality and value along the food supply chain [1]. Food waste is expected to increase by 33% by 2030, reaching 2.1 billion tons, or \$1.5 trillion [2]. This can happen due to several factors, including poor planning, poor stock management, a lack of understanding of expiration dates and signs of food spoilage, or bad habits.

Food waste behavior on a household scale is the waste of food that occurs when food is wasted. According to [3] households generate around 3 kg of unnecessary food waste per week. Food waste behavior in the household can have negative impacts ranging from economic implications to adverse health impacts. The most superficial negative effect of food waste behavior is economic waste, where money spent on buying, preparing, and cooking food is wasted. This condition can lead to increased household expenses, especially food waste behavior, which is carried out routinely. In addition, food waste behavior can also affect the demand for certain food products that exceed supply. It will cause price increases, ultimately impacting consumers by forcing them to pay more for their daily food needs.

The high volume of household food waste will align with the significant waste processing costs that families and the government must bear. On the other hand, when food is thrown away, all the potential nutritional value contained in it will also be lost, so that each individual in the household unknowingly loses the nutritional potential of the resulting food waste. Therefore, it is essential to analyze the magnitude of the negative impact of food waste behavior in more detail, especially regarding economic and nutritional losses.

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B. Sobirov et al. (eds.), *Proceedings of the 2nd International Conference on Advanced Research in Social and Economic Science (ICARSE 2023)*, Advances in Social Science, Education and Humanities Research 842,
https://doi.org/10.2991/978-2-38476-247-7_78

This study examines the extent of the negative impact of food waste behavior on economic and nutritional losses on a household scale. As an implication, there is a need for efforts to increase awareness at the household scale regarding wise food management, menu planning, proper food storage, utilization of leftovers, and understanding of expiration dates. The goal is that every household member can reduce food waste, save money, and improve family nutrition. As a result, reducing food waste can be essential to increasing food security and the sustainability of the global food system.

2 Research Method

This research was conducted in the Special Region of Yogyakarta. Data collection was carried out for 3 months in May – July 2023. The type of data used was primary data obtained using the Google Forms platform which was distributed snowball via social media both individually and in groups (WhatsApp and Instagram) as well as offline surveys. carried out using random sampling technique. Offline surveys were conducted to avoid bias that occurs in online surveys which usually cannot reach target populations who do not have internet access. The offline survey was conducted through structured interviews with several respondents in the DIY area. Apart from that, secondary data was also used which was obtained based on the results of literature studies in various archives and statistical data from related agencies. In this research, a sample of 203 households was obtained in the Special Region of Yogyakarta. To meet survey requirements, respondents must be at least 17 years old and responsible for managing food in the household.

The value of economic losses and nutritional losses is calculated from data obtained from data collection using online and offline questionnaires. Food waste will translate into wasted economic and nutritional value due to food waste behavior. The economic value will be analyzed manually using the estimated price of rice multiplied by the amount of rice wasted, while the nutritional value will be analyzed using Nutrisurvey 2007.

3 Result and Discussion

Several households in the Special Region of Yogyakarta produce food waste from food consumption, especially rice. As many as 73% of households produce food waste, the remaining 27% of households do not produce rice food waste (Figure 1). In line with research [4] which states that organic waste dominates the total waste in housing in the Yogyakarta area and 45.6% comes from food waste. Most DIY households produce food waste. Meanwhile [5] reported that village households in Yogyakarta wasted 26-50% of the portion of rice served at home.

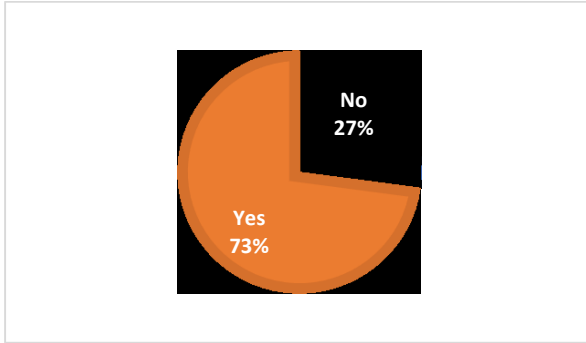


Fig 1. Percentage of Households Generating Food Waste (Rice)

Households that do not produce food waste usually have livestock in their homes such as poultry (chickens, ducks) and fish. Apart from that, some household food managers can also manage leftover food from today to be consumed again the next day or processed into other foods, for example leftover rice is re-processed into fried rice. Meanwhile, the reason households produce food waste is because it is given by other people when there is enough food at home and family members buy food outside so that food cooked at home is not eaten. According to Talia et al., (2019) income and consumer choices regarding food expenditure are one of the factors that influence the amount of food waste. [7] states that someone who has a sufficient level of income tends to buy excess food and has the opportunity to produce food waste. Most of the monthly family income at the household level in the Yogyakarta Special Region (Table 1) is above the UMP in 2022, amounting to IDR 1,840,915.53.

Table 1. Monthly Family Income at the Household Level in the Special Region of Yogyakarta

Income (IDR)	Percentage (%)
<1.500.000	18,23
1.500.001-3.000.000	25,62
3.000.001-4.500.000	14,29
4.500.000-6.000.000	16,75
>6.000.000	25,12
Total	100,00

Source: Primary Data Analysis (2023)

The number of household members also influences the reduction of food waste per capita, where the fewer household members cause the amount of food waste produced to be smaller [8]. [9] reported that food waste was found to be higher when there were more members in one household. As many as 78.82% of households in the Special Region of Yogyakarta have family members of 1 to 4 people. The number of family members with more than 7 people is 1%. Usually the number of household members is very large because there are 3 generations in one house and this usually happens in rural areas.

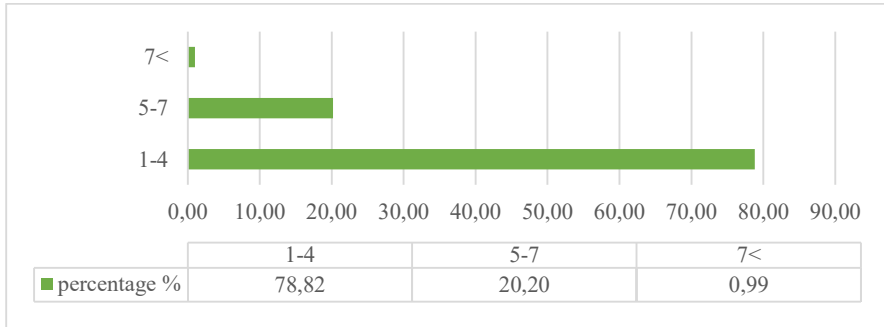


Fig 2. Number of Household Family Members in the Special Region of Yogyakarta

Status as a housewife who does not work also influences the reduction of household food waste [10]. In this study, 35% were housewives who did not work and 29% of families who did not produce food waste were housewives who did not work. This shows that housewives have more time to manage food at home compared to working housewives so they can reduce food waste. [11] stated that moral attitudes and eating habits are important determinants of food waste behavior. Age, income, consumption style, shopping planning have a significant effect on wasteful behavior [12]. Meanwhile, gender differences influence food waste behavior, which in the research of [13] it is known that women produce more food waste than men, namely 60%.

This research focuses on rice food waste because it is easier to calculate the amount wasted compared to vegetables, fruit and other foods. Apart from that, rice is the staple food of Indonesian people. Wasted rice can be calculated economically, energy and carbohydrates. The economic calculation is calculated by multiplying the amount of rice wasted by the average price of rice in the Special Region of Yogyakarta, namely IDR 3,000. Meanwhile, energy and carbohydrate losses are calculated using nutrisurvey2007. In table 2, you can see the economic and nutritional losses due to food waste per month at the household level in the Special Region of Yogyakarta. The average household economic loss per month is IDR 17,586, energy loss is 970 kcal and carbohydrate loss is 211 grams.

Tabel 2. Economic and Nutritional Losses from Food Waste per Month at the Household Level in the Special Region of Yogyakarta

Type of Loss	Max	Min	Average
Economy (IDR)	168,000	-	17,586
Energiy(kcal)	9,054	-	970
Carbohydrate (gram)	2,013	-	211

Source: Primary Data Analysis (2023)

If an estimate is made of the average household economic loss for one year, the loss is IDR 211,032. The number of households in the Special Region of Yogyakarta increases every year with an average growth of 1.4 percent per year. In 2021 the number of households in DIY will be 1,260,218. If the economic loss for all families in DIY is estimated using this year's research data, the economic loss will reach 265 billion per year. Based on the food waste study report from Bappenas, the estimated food waste in Indonesia reaches 80% which is generated at the consumption stage by households and is closely related to consumer behavior [14].

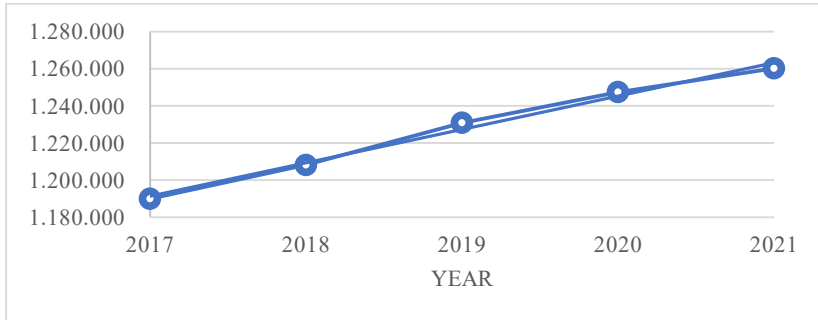


Fig 3. Number of household heads in the Special Region of Yogyakarta
Source: DIY Regional Secretariat Governance Bureau (2023)

Researches [15] in Kebon Jeruk, West Jakarta also shows that food waste behavior is known to cause households to experience economic loss and nutrition loss. The research results show that the types of food that are most often wasted are rice, vegetables, fruit, vegetable products and meat. Even though losses due to food waste in one household do not have an impact on family resilience, this has a large impact when viewed from a macro perspective (both regional and global). Therefore, alternative policies are needed from the government to reduce household food waste. One effort that can be made is to carry out behavioral interventions in managing food waste. The government can provide special education classes for processing food waste in the form of food recipes, video tutorials and structured hands-on demonstrations in one village. The campaign to build household awareness of the waste problem is important to be involved.

4 Conclusion

Economic and nutritional losses due to wasted food per month at the household level in the Special Region of Yogyakarta are an average of IDR. 17,586 per month, energy loss of 970 kcal and carbohydrate loss of 211 grams. The implication is that there needs to be efforts to increase awareness at the household scale regarding wise food management, menu planning, correct food storage, utilization of leftover food, and understanding expiration dates. Apart from that, alternative policies are needed from the government to reduce household food waste by providing special education classes on food waste processing.

Acknowledgements

We would like to thank the Universitas Pembangunan Nasional Veteran Yogyakarta for funding this research in the 2023 Fiscal Year with contract number 111/UN62.21/LT/V/2023. We would also like to thank the Institute for Research and Community Service (LPPM), lecturers, research assistants and respondents who have supported this research so that it can run well.

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