

Affirming Food Waste Mitigation Practices During Pandemic: A Case Study of Green-grocers in Purwokerto, Indonesia

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ABSTRACT

During the COVID-19 pandemic, people tend to panic buying and hoard food supplies. This can trigger an increase in food waste during the pandemic, especially vegetable food waste. This also happens at the level of traders, especially green-grocer who sell in traditional markets. The behavior of traditional market traders who fail to adapt to food safety standards, poor handling, resulting in the emergence of food waste, especially during the pandemic. This study aims to determine the factors that cause vegetable food waste at the level of green-grocers. The method used is qualitative and quantitative with data collection techniques using questionnaires. The sampling was conducted using random sampling and the gained respondents are 111 green-grocers. Then, Chi-Square test is conducted to test the statistical correlation between green-grocer demographic and their preferences about food waste mitigation. The results show there is a correlation between the preferences of green-grocers related to food waste with their demographics. Furthermore, some traders' activities still cause food waste and some of them also don't know what food waste is and what food safety standards are. The less food safety standards, the greater the potential for food waste generated.

Keywords: food waste; green-grocer; purwokerto; vegetables

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1. Introduction

The Food and Agricultural of the United Nations (FAO) stated that the COVID-19 pandemic affected the condition of food security and people's incomes (Food And Agriculture Organization, 2020). The COVID-19 pandemic has had a major impact on various fields, especially in the fields of health, economy and the social environment (Dieny et al., 2021). This can change people's consumption behavior after the pandemic. One of the triggers for food insecurity during the pandemic is the increase in food waste during the pandemic, especially vegetable food waste (Martinez et al., 2020). Food waste is some part of food that cannot be consumed (Tostivint et al., 2016).

These foods can no longer be consumed, which can be caused by several factors, including

food that is starting to decay, food that is not guaranteed to be clean and food that is not fresh. Food waste can come from agricultural products that are easily decomposed which is naturally caused by high water content (Charis, 2012). Based on data from the National Waste Management Information System (2021) shows that the market is an indicator of waste contributors who experienced an increase in the percentage of waste contributors during the pandemic. The increase in the percentage of market waste to 28.66% where in 2019 the percentage of waste was 21.75% (SIPSN, 2020). One type of food waste that is included in the food category that causes food waste during the COVID-19 pandemic in the market is vegetables (Amicarelli et al., 2021).

In order to meet their daily food needs, generally people will shop at markets, both traditional markets and modern markets. Traditional markets have many shortcomings, including slum places, unattractive product packaging, no air conditioning, poor quality food

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products, air pollution and noise pollution (Yamato, 2011). These traditional market conditions face considerable challenges to the sustainability of the buying and selling process during the COVID-19 pandemic (Safutra et al., 2019). One of the triggers for the increase in food waste during the pandemic is lifestyle changes and changes in people's consumption habits and consumer behavior (Aldaco et al., 2020). People tend to do panic buying and hoard food supplies and prioritize food hygiene as a form of concern from the pandemic and the government's COVID-19 transmission prevention policy (Azharina et al., 2021). The behavior of each individual consumer during the pandemic will affect consumer decisions in shopping both in choosing places such as traditional markets and purchasing methods so that it has the potential to cause food waste in vegetables. Changes in people's behavior and consumption patterns since the pandemic have greatly impacted the behavior and habits of traditional market traders as a trigger for the emergence of food waste in the market. The behavior of traditional market traders who fail to adapt to food safety standards, poor handling and operational performance of vegetables and food safety knowledge can affect the increasing production of food waste during the pandemic (Amicarelli et al., 2021). Green-grocers in traditional markets do not provide a variety of vegetables that consumers need such as types of organic vegetables (Aker et al., 2018). Green-grocers in traditional markets also lack knowledge about product safety during the COVID-19 pandemic. Therefore, people prefer to shop online to meet their needs. Green-grocers in the market need to adjust the products and packaging that will be sold to food safety standards, especially during the pandemic so that people are interested in buying (Brennan et al., 2020). Another factor that triggers vegetable food waste is the lack of communication skills and knowledge related to marketing, poor management, demographic conditions and the category or type of product being sold is not in accordance with quality standards so that it is not in line with consumer expectations during the pandemic (Yetkin Özbük & Coşkun, 2020).

Green-grocers also lack storage facilities, inadequate transportation systems, inadequate vegetable packaging, poor demand and supply forecasting, lack of information sharing and handling and poor operational performance (Magalhães et al., 2021). The gap between supply

and people's consumption behavior in traditional markets related to vegetables will lead to food waste. Poor management of green-grocers towards perishable products as well as agreements between suppliers and traders in a poor supply chain system can lead to the emergence of food waste in traditional markets (Chauhan et al., 2021).

2. Theoretical Underpinning

2.1. Vegetables Food Waste

Food waste is leftover food that is wasted because it can no longer be consumed or caused by negligence in the production, processing and distribution processes (Siaputra et al., 2019). Food waste in vegetables is caused by the high-water content in vegetables so that vegetables quickly rot. Meanwhile, vegetables are all types of plants or plant parts that can be processed into food. Thus, vegetable food waste is part of the remaining vegetables that are wasted because they cannot be consumed anymore or are caused by negligence in the production, processing and distribution processes (Utama & Mulyanto, 2009).

2.2. Food Waste Mitigation

Food waste prevention strategies that can be done are to recycle food waste and provide price reductions for vegetables that are not sold on that one day. Vegetable waste that is not sold can also be resold as animal feed (Morone et al., 2019). In addition, mitigation efforts that can be done are that the government needs to create a program or provide socialization to consumers and green-grocers regarding food waste, inventory forecasting and handling of vegetables and food waste prevention. Vegetable food waste can also be utilized in the composting process, food redistribution and redesign of vegetable sales stands and supply chains. The government also needs to provide guidance and socialization regarding the marketing strategy of green-grocers in accordance with the development of food retail (Aschemann-witzel et al., 2020).

2.3. Consumer Behavior

Consumer behavior is a consumer process to decide in the process of buying, disposing and using goods and services to be purchased. Consumer behavior can be interpreted as a study of units of purchase and exchange processes that involve the acquisition, consumption and disposal of goods, services, experiences and ideas (Hariyadi, 2016).

Factors that influence consumer buying behavior include the following (Simamora, 2004) :

1. Cultural factors

Cultural factors have a high enough influence on consumer buying behavior. In this case, the seller must know the role of the buyer's culture, subculture and social class.

2. Social factors

Social factors that influence consumer decisions include groups, families, roles and status.

3. Personal factors

Purchasing decisions are influenced by personal factors, namely age and life cycle stage, occupation, economic circumstances, lifestyle and personality and self-concept.

4. Psychological factors

Psychological factors that influence consumer purchases include motivation, perception, knowledge and beliefs and attitudes.

3. Research Methods

This research was conducted in traditional markets around the Purwokerto area Banyumas Regency, Central Java Province, Indonesia. Purwokerto is selected based on data from the Central Statistics Agency of Banyumas, most of the population in Banyumas Regency works in the large trade and retail sectors, which is 22.33%

(BPS Banyumas, 2020) and Banyumas has faced the problem about waste management which reached 600 Tons/day but only 270 Tons/day can reach disposed area because the area limitation in Banyumas (Priatna et al., 2019). Furthermore, The disposed area was considered are not efficient enough even though they have reached 73% of their efficiency (Ikhsan, 2022).

The method used is qualitative and quantitative with data collection techniques in the form of distributing questionnaires. The number of respondents is 111 who are traditional market green-grocers in Purwokerto. The number of samples obtained through the Slovin formula by simple random sampling method.

The data taken are in the form of demographics and food waste mitigation preference data for green-grocers. Demographic data includes gender, age, type of vegetables and income. These attributes can be identified as the behavior of green-grocers. These attributes can be identified as the behavior of green-grocers (Azharina et al., 2021) (Chammas & Yehya, 2020) (Amicarelli et al., 2021) (Masithoh et al., 2017). Meanwhile, mitigation preferences include consumer shopping habits, vegetable marketing, vegetable handling, transportation systems, knowledge, environment and storage (Table 1). So the hypothesis formed is, H1 = there is an influence of retail behavior on the emergence of vegetable food waste during the pandemic.

Table 1. Questionnaire attributes of green-grocers in Purwokerto Market

Criteria	Code	Statement
Consumer shopping habits (Chammas & Yehya, 2020) (Das & Varshneya, 2017)	P1	During the pandemic, consumers continue to shop at the market to meet their daily needs
	P2	During a pandemic, consumers tend to choose products that have good packaging
	P3	During the pandemic, consumers are even more selective in choosing vegetables
Vegetable marketing (Akter et al., 2018) (Hariyadi, 2016)	P4	Traders sell vegetables according to food safety standards
	P5	Traders provide various types of vegetables including organic vegetables
	P6	Traders market vegetables with packaging that meets consumer expectations
	P7	Merchants provide price reductions to consumers
	P8	There is a price increase during the pandemic
Vegetable handling (Amicarelli et al., 2021) (Ali & Christiawan, 2019)	P9	During the pandemic, leafy vegetables are not sold the next day
	P10	During the pandemic, root vegetables are not sold the next day
	P11	During the pandemic, leafy vegetables that don't sell, are sold at a low price
	P12	During the pandemic, root vegetables that don't sell well are sold at a low price

Criteria	Code	Statement
	P13	Vegetables that are damaged as a result of shipping products are sold at low prices
Transport Systems (Magalhães et al., 2021) (Chauhan et al., 2021)	P14	During the delivery of goods from suppliers to traders there are adequate transportation facilities
	P15	The distance of product delivery from suppliers to traders is quite far
Knowledge (Martinez et al., 2020) (Lee, 2018)	P16	Traders have awareness about vegetable food waste during the pandemic
	P17	Traders are aware of food safety standards during the pandemic
Environment (Masithoh et al., 2017) (Safutra et al., 2019)	P18	The hygiene environment around the market affects consumer spending interest during the pandemic
Storage (de Moraes et al., 2020) (Magalhães et al., 2021) (Yetkin Özbük & Coşkun, 2020)	P19	Merchants have sufficient storage space before sales during the pandemic
	P20	Merchants have sufficient storage space after sale during the pandemic

The questionnaire data obtained were measured using a Likert scale. The collected data will then be tested for validity, reliability, and normality. Data processing and testing will be carried out using Minitab 19 software

4. Results and Discussion

4.1. Respondent Demographics

The demographics of the respondents showed that green-grocers were dominated by women, namely 73.9% and men by 26.1%. Green-grocers in the Purwokerto market sell two types of vegetables, namely heterogeneous vegetables by

73% and homogeneous vegetables by 27%. The age of green-grocers in the Purwokerto market is dominated by the age range above 50 years, which is 35.1%. Other green-grocers are in the age range of 41 - 45 years and 46 - 50 years each with 21.6%. While in the age range of 36-40 years by 16.2% and in the age range of 31-35 years by 5.40%. The total turnover per day of green-grocers is dominated by under Rp. 500,000, which is 68.5%. While the daily turnover of other green-grocers is in the range of Rp. 500,000 – Rp. 1,500,000 by 23.4% and in the range of Rp. 1,600,000-Rp. 2,600,000 by 8.1% (Table 2).

Table 2. Demographics of respondents

Characteristics	Quantity (N)	Distribution (%)
Gender	Male	29
	Female	82
Vegetable Types	Heterogeneous	81
	Homogeneous	30
Age	31 to 35 years	6
	36 to 40 years	18
	41 to 45 years	24
	46 to 50 years	24
	> 50 years	39
Turnover/Day	< Rp 500,000	76
	Rp 500,000 – Rp 1,500,000	26
	Rp 1,600,000 – Rp 2,600,000	9

4.2. Validity, Reliability and Normality Test Results

The order of data processing carried out is validity, reliability and normality tests. Validity, reliability and normality tests are calculated based on the number of respondents from the results of

distributing questionnaires, namely 111 respondents using Minitab 19 software. The level of confidence used is 95% and error is 5%. The validity test method is carried out using the Pair-Wise Correlation value to see the correlation between items in the independent variable. The data is said to be valid if the significance value (p

value) < significant level (0.05) (Salutondok & Soegoto, 2015).

The results of the validity test were obtained by looking at the total score of each statement item from the questionnaire. Through the results of the validity test, it is known that P8 can be said to be invalid with a significant value of 0.540 where the significance value > significant level (0.05). Thus, P8 is not taken into account. After the validity test is done, then the next is the reliability test which is carried out using 19 statement items from the questionnaire results. The reliability test technique used in this study is Cronbach Alpha. The Cronbach Alpha validity test technique was used because data collection on respondents was only carried out once and not on a test-retest basis (Malik et al., 2015).

The results of the reliability test were then measured by looking at the Cronbach Alpha value with a significant level. The questionnaire is said to be reliable if the Cronbach Alpha value > 0.60 while the questionnaire is said to be unreliable if

Cronbach Alpha < 0.60 (Widi, 2011). Thus, through the results of the reliable test, the 19 items of the research questionnaire statement can be said to be reliable or trustworthy. After testing the reliability test, the next step is to test for normality. The normality test in this study was carried out using the Skewness and Kurtosis test methods. The reason for using this method is because the Skewness-Kurtosis test can make a decision on a normality test if it is used on data with an average value smaller than the standard deviation (Kuntoro, 2007). Data is said to be normally distributed if the skewness value is between -2 and +2 (George & Mallery, 2010) and the kurtosis value is between -7 and +7 (Hair et al., 2010). Through these criteria, it can be concluded that the 19 items of the questionnaire statement can be said to be normally distributed. The results of the validity, reliability and normality tests are then interpreted into a table which can be seen in Table 4.

Table 4. Validity, Reliability and Normality Test Output

Activity	Code	Validity	Reliability	Normality	
		Pearson correlation	Cronbach alpha	Skewness	Kurtosis
Consumer shopping habits	P1	0.047	0.7291	-0.05	-1.11
	P2	0.005			
	P3	0.000			
	P4	0.000			
	P5	0.000			
Vegetable Marketing	P6	0.000			
	P7	0.000			
	P8	0.540			
	P9	0.000			
	P10	0.000			
Vegetable Handling	P11	0.000			
	P12	0.003			
	P13	0.000			
Transport System	P14	0.000			
	P15	0.000			
Knowledge	P16	0.000			
	P17	0.000			
Environment Storage	P18	0.000			
	P19	0.000			
	P20	0.000			

4.3. Chi Square Test Results

Testing the hypothesis of the relationship between the demographic conditions of green-

grocers (Type of Vegetables, Age, Turnover/day, Gender) in Purwokerto Traditional Market with food waste mitigation variables for green-grocers, using the Chi Square method (Table 5).

Table 5. Chi Square test results

Code	Vegetable Types		Age		Turnover/Day		Gender	
	Pearson	DF	Pearson	DF	Pearson	DF	Pearson	DF
P1	17.673*	4	31.184*	16	10.635	8	7.309	4
P2	1.495	4	12.955	16	25.654*	8	2.673	4
P3	6.643	3	8.035	12	8.628	6	6.418	3
P4	10.206*	3	24.721	12	15.318*	6	12.344*	3
P5	36.367*	4	35.065*	16	39.528*	8	16.776*	4
P6	13.758*	4	17.657	16	19.525*	8	6.902	4
P7	51.55*	4	37.866*	16	31.098*	8	18.492*	4
P9	17.43*	3	19.552	12	8.501	6	3.182	3
P10	28.969*	3	22.377*	12	21.569*	6	9.321*	3
P11	53.352*	4	27.764*	16	27.968*	8	11.326*	4
P12	2.606	4	20.978	16	18.063*	8	0.897	4
P13	47.474*	4	27.874*	16	21.689*	8	8.415	4
P14	35.632*	4	28.762*	16	29.986*	8	9.776*	4
P15	6.553	4	23.255	16	10.521	8	5.15	4
P16	17.403*	4	30.147*	16	17.663*	8	6.38	4
P17	13.85*	3	20.908	12	9.712	6	14.519*	3
P18	12.433*	3	22.334*	12	16.505*	6	4.627	3
P19	17.688*	3	50.463*	12	16.755*	6	1.966	3
P20	19.61*	3	50.683*	12	22.425*	6	1.642	3

* = Has correlation

Based on the results of the Chi Square test, it is known that the types of vegetables sold by green-grocers and the age of the green-grocers affect consumers to keep shopping at the market to meet their daily needs during the pandemic (P1). The turnover per day of green-grocers affects consumer habits where during a pandemic consumers tend to choose products that have good packaging (P2). Meanwhile, consumer habits were even more selective in choosing vegetables during the pandemic (P3) not influenced by the demographic conditions of green-grocers (type of vegetables, age, turnover per day, gender).

Based on the results of interviews with green-grocers at the Purwokerto Traditional Market, it was shown that during the pandemic, there were still vegetable consumers who shopped at the market to meet their vegetable needs. Some vegetable consumers who shop at the Purwokerto Traditional Market are even more selective in buying vegetables, but there are also some who continue to buy vegetables without being more selective like the conditions before the pandemic. The condition of vegetable consumers in the Purwokerto Traditional Market is in line with research conducted by Nugroho & Yuliawati (2021) where some vegetable consumers who shop for vegetables in traditional markets are selective during the pandemic. This is in line with research conducted by Sinaga & Purba (2020)

where during the COVID-19 pandemic, vegetable consumers continued to shop at traditional markets to meet their needs even though the scale of buying and selling transactions in traditional markets decreased drastically.

The activity of green-grocers in selling vegetables in accordance with food safety standards (P4) is influenced by the types of vegetables sold by green-grocers, turnover per day and the sex of green-grocers. In addition, the activities of green-grocers who provide various types of vegetables including organic vegetables (P5) are influenced by the type of vegetables, age, turnover per day and gender of the green-grocers. The types of vegetables sold by green-grocers and the daily turnover of green-grocers affect the activities of green-grocers to market vegetables with packaging that is in accordance with consumer expectations (P6). Meanwhile, the activity of green-grocers providing price reductions to consumers (P7) is influenced by the demographic conditions of green-grocers, namely the type of vegetables, age, turnover per day and gender of green-grocers.

The vegetable marketing criteria are in line with research conducted by Nugroho & Yuliawati (2021) regarding vegetable marketing in traditional markets where the activities of green-grocers such as providing organic vegetables, increasing prices and providing price reductions to

consumers have a correlation with the demographic conditions of green-grocers. In addition, vegetable packaging and food safety standards have a correlation with the demographics of green-grocers in the Purwokerto Traditional Market. In addition, Mareta, (2011) studied the importance of good vegetable packaging and keeping vegetables in accordance with food safety standards. In addition, during the pandemic, leafy vegetables that were not sold the next day (P9) were influenced by the types of vegetables sold by green-grocers.

Other green-grocers' activities are influenced by the type of vegetables, age, turnover per day and gender of the green-grocers, namely during the pandemic, root vegetables are not sold, sold the next day (P10) and during the pandemic, leaf vegetables are not sold at low prices. cheap ones (P11). Meanwhile, the activities of green-grocers who sell root vegetables that do not sell at low prices (P12) are influenced by the daily turnover of green-grocers. Based on the results of interviews and questionnaires with green-grocers, it was shown that at the time of delivery there was damage to the vegetables. This causes green-grocers to sell vegetables damaged by shipping at low prices (P13) where the activity is influenced by the type of vegetables sold, age and turnover per day of green-grocers. This is in line with research conducted by Hidayat et al., (2021) where during the pandemic, green-grocers at the Borneo Traditional Market provided promo prices or price reductions to consumers in order to keep their income. Apart from damage to vegetables during shipping, some green-grocers lack adequate facilities.

The activity of green-grocers who provide adequate transportation facilities (P14) is influenced by the type of vegetables sold, age, turnover per day and gender of green-grocers. Some green-grocers only use the transportation available at the market. This is influenced by the expensive shipping costs compared to the sales of vegetables that will be obtained. In addition, the distance of delivery of goods from suppliers to traders who fall into the far category (P15) is not influenced by the demographic conditions of green-grocers.

Based on the results of interviews and questionnaires, several green-grocers in the Purwokerto Traditional Market buy vegetable supplies from suppliers who are far from the market or the domicile of the green-grocers. The results of interviews with green-grocers show that

most of the green-grocers who maintain selling at a considerable distance from their homes are caused by continuing the business of their parents and are comfortable selling in the market. Some other green-grocers buy vegetables from suppliers who are close to the market and domicile of the green-grocers. In addition, green-grocers with a lower level of vegetable sales buy supplies of vegetables to be sold from large green-grocers in the same market. This is in line with research conducted by Magalhães et al., (2021) where this study shows that the demographic conditions of green-grocers affect the activities of green-grocers related to the vegetable transportation system which can cause food waste and food loss.

The knowledge possessed by green-grocers affects the activities of green-grocers in the market. During the pandemic, the activities of green-grocers who have awareness about vegetable food waste (P16) are influenced by the demographic conditions of green-grocers, namely the type of vegetables, age and turnover per day. Based on the results of interviews in the field, it shows that green-grocers aged 41-45 years have more awareness of food waste during the pandemic. During the pandemic, the vegetable seller changed the types of vegetables that were originally homogeneous to heterogeneous. In addition, the vegetable seller changed the types of vegetables to be sold into vegetables that have a longer shelf life than maintaining vegetables that are easily wilted during the pandemic.

Based on the results of interviews in the field, it shows that the turnover per day of green-grocers affects awareness about food waste. Most of the green-grocers in the Purwokerto Traditional Market do not yet have awareness about food waste. Most of the green-grocers sell vegetables at lower prices not because of awareness about food waste but so that the green-grocers still have a minimum income according to the expenses for selling these vegetables. This is due to market conditions where there are no buyers during the pandemic. Therefore, the daily turnover of green-grocers has drastically decreased compared to before the pandemic. In addition, during the pandemic, green-grocers are required to have better food safety standards than before in order to attract buyers.

Green-grocers who sell vegetables with food safety standards (P17) are influenced by the type of vegetables and the sex of the green-grocers. Green-grocers at the Purwokerto Traditional Market who are female are more aware

of food safety standards during the pandemic than male green-grocers. The female green-grocers pay more attention to the condition of the vegetables to be sold in order to attract buyers, such as separating the damaged vegetables from those that are still good. In addition, most of the female green-grocers prefer to maintain the cleanliness of vegetables by providing packaging for vegetables that are safe to be packaged and grouping one type of vegetable with other vegetables so that they are not easily contaminated. Green-grocers who have heterogeneous types of vegetables pay more attention to the location and arrangement of vegetables that one can be placed side by side with other vegetables so that the vegetables do not get damaged and wither. In addition to food safety standards, the cleanliness of the market environment also attracts consumers to shop. This is in line with research conducted by Özbük & Coşkun, (2020), which in this study shows that the knowledge of green-grocers has a correlation with the activities of green-grocers, causing food waste.

Based on the results of interviews and questionnaires with green-grocers, it shows that the cleanliness of the market environment affects consumer spending interest during the pandemic. The cleanliness environment around the market (P18) is influenced by the type of vegetables, age and turnover per day of green-grocers. Green-grocers who are in the 41- 45 years old pay more attention to the conditions around their sales outlets so that they are cleaner and neater and the arrangement of vegetables sold is based on the type of vegetables. Some green-grocers are of the opinion that paying attention to the condition of the sales outlets and maintaining the quality of the vegetables sold will greatly attract consumers' interest so that the vegetables sold run out faster and still get an optimal turnover per day during the pandemic.

In addition to environmental cleanliness, vegetable storage also supports the activities of green-grocers. Based on the results of interviews with green-grocers in the Purwokerto Traditional Market, it shows that the green-grocers in the Purwokerto Traditional Market do not have adequate storage. Adequate storage before sales owned by green-grocers during the pandemic (P19) and Adequate storage after sales owned by green-grocers during the pandemic (P20) were influenced by the type of vegetables, age and turnover per day of green-grocers.

Green-grocers in the Purwokerto Traditional Market generally sell vegetables

directly right after the vegetables are picked up from the supplier. Some vegetable vendors who sell vegetables that can be slowed down, such as broccoli, cauliflower, beans and mustard greens that are not sold out in one day, take the vegetables home and store them in the refrigerator. Some other green-grocers only take advantage of the storage facilities provided in the market. In addition, green-grocers in the 41-45 years old pay more attention to vegetable storage. In addition, green-grocers who have a daily turnover in the range of Rp. 500,000 – Rp. 1,500,000 generally sell vegetables on a large scale to provide more adequate vegetable storage. This is in line with research conducted by Ali & Christiawan, (2019) where this study shows that the factors that influence the level of participation of traders in waste management consist of internal factors which include education, income, concern for waste and knowledge about waste.

4.4. Vegetable Food Waste Mitigation Advice

Food waste mitigation suggestions given by green-grocers at the Purwokerto Traditional Market can be seen in Table 6.

Table 6. Vegetable Food Waste Mitigation Suggestions

Description	Amount (N)	Distribution (%)
Donate	5	4.55
Advice for Government	11	10.00
Adequate Storage	9	8.18
Alternative Sales	3	2.73
Waste Treatment	10	9.09
Self - consumed	10	9.09
Active Role of Students	1	0.91
None	54	48.65
Animal Feed	6	5.45
Cheap Sale	2	1.82

Based on the results of interviews with green-grocers, it was obtained that the most advice given by green-grocers was 48.65% of green-grocers in Purwokerto Traditional Market who did not give advice. Through interviews with green-grocers who did not provide advice, it showed that

the green-grocers were dominated by not knowing and not implementing the practice of mitigating vegetable food waste in the Purwokerto Traditional Market. Regarding this, the researchers provide recommendations to provide socialization to green-grocers.

This is in line with the research conducted by Nainggolan & Supraptini, (2012) and Zamzammi (2015) where based on the research that has been done, it is necessary to disseminate information to green-grocers in traditional markets and green-grocers also prefer that coaching is done in a tangible form. Based on this, recommendations for mitigating vegetable food waste are given to green-grocers at the Purwokerto Traditional Market, namely in the form of socialization and coaching that is carried out in real form. Another recommendation for the government is the need to provide new regulations related to food waste prevention where supervision and monitoring are carried out for a certain period of time at least once a month and apply a fine system. In addition, the government also needs to provide a place for waste management and a vegetable chopping machine. Cooperation between village businesses such as Village Owned Enterprises (BUMDES) and Micro, Small and Medium Enterprises (UMKM) can be carried out to accommodate vegetables that are still suitable for animal feed and food waste processing such as to make fertilizer and biogas.

Provision of adequate storage is also highly recommended in the form of a refrigerated storage warehouse specifically for vegetables at the Purwokerto Traditional Market. Provision of refrigerated storage will increase the shelf life of vegetables that are perishable (perishable) (Sari et al., 2019). Based on the results of interviews with green-grocers at the Purwokerto Traditional Market, the green-grocers wanted the provision of refrigerated storage and rearrangement of the layout of the Purwokerto Traditional Market. Improvement and development of traditional market facilities will maintain the interest of visitors to shop at traditional markets (Angraini et al., 2017)

5. Conclusion

This study aims to determine the practice of mitigating the emergence of food waste during the pandemic at green-grocers in Purwokerto. The findings of this study indicate that there is a correlation between the preferences of green-grocers regarding food waste and the

demographics of traders. Furthermore, some traders' activities still cause food waste and some traders also don't know what food waste is and what food safety standards are. The less food safety standards, the greater the potential for food waste generated.

Recommendations that can be given to the government are that it is necessary to provide new regulations related to the prevention of food waste accompanied by supervision and monitoring for a certain period of time at least once a month and implement a fine system. The provision of waste processing and vegetable shredding machines is also recommended. In addition, cooperation between village businesses such as Village-Owned Enterprises (BUMDES) and Micro, Small and Medium Enterprises (MSMEs) can be carried out to accommodate vegetables that are still suitable for livestock food and food waste processing such as to make fertilizers and biogas. Another mitigation recommendation is the provision of refrigerated warehouses at the Purwokerto Traditional Market to increase the shelf life of vegetables so that food waste mitigation can run well.

Future research can focus on the correlation of food waste generation activities in green-grocers with consumer behavior. In addition, the comparison of the activities of the emergence of food waste during the pandemic and after the pandemic is to look for more preventive and mitigative actions.

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