Post-pandemic analysis of millennial consumers' purchasing behavior and expenditure for online food products

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Abstract. The millennial generation is the primary consumer group in Indonesia today, covering more than a quarter of the population. They are known for their familiarity with purchasing food products online. This research aims to understand purchasing behavior and the factors related to millennial consumers' online food expenditure post-COVID-19 pandemic. Frequency analysis, ordinary least squares (OLS), and log-log regression were employed to explore purchasing behavior and factors pertaining to millennial consumers' online food expenditure. A total of 182 millennial consumers from across Indonesia participated as respondents by filling out a self-administered questionnaire via Google Forms. The results disclosed that most respondents were late millennials with bachelor's degrees who lived in urban areas and were within the middle-income group. Professionals dominated the occupation of the respondents, with monthly food expenditures below IDR 500,000. Their primary reason for purchasing food online was to save time, and they frequently did it 2-3 times per month, with fresh foods being the most commonly purchased item. Smartphones were the preferred device, and marketplaces were the most utilized platform. Regression analysis unveiled that higher purchase frequency and post-pandemic changes significantly raised online food expenditures among millennials.

1 Introduction

Indonesia is one of the countries experiencing rapid development in digital business. With a population of 278.7 million people in 2023 [1], approximately 64.8% of the population, or 185.3 million people, are Internet users [2]. The value of spending through e-commerce platforms in Indonesia is expected to grow from USD 52.93 billion in 2023 to USD 86.81 billion by 2028 [3], positioning Indonesia as the country with the most prominent digital economy in Southeast Asia [4].

Millennials, also known as Generation Y, cover over a quarter of Indonesia's total population based on the 2020 Population Census [5]. They are the generation born between 1981 and 1996 [6,7], the most familiar generation with information technology

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applications, such as e-commerce, compared to previous generations [8]. A survey conducted by Snapcart in 2018 unveiled that millennial consumers dominated e-commerce shopping in Indonesia, contributing to 50% of e-commerce shoppers [9].

As a generation born in the Internet era, Millennials' behavior is strongly influenced by developments in information technology. More specifically, their behavior is primarily shaped by advancements in Internet technology [10]. When the COVID-19 pandemic struck, the use of information technology in this generation cohort encountered a significant rise. The behavior of this generation, which is different from the previous generation and its dominant population, has been an interesting issue to investigate, even before the pandemic. Although purchasing behavior after the pandemic does not return to what it was before the pandemic [11].

Various studies examined the behavior of millennial consumers in Indonesia in purchasing food products ranging from organic [12] and halal foods [13], to imported [14] and traditional foods [15]. Several factors influence millennial consumers' purchasing decisions. Education level is one significant factor in determining purchasing decisions for millennial consumers [16]. Additionally, reviews on social media also significantly influence purchase intentions for food products [17].

In addition, several specific studies investigated millennial consumer behavior in Indonesia, particularly in purchasing food products during and post-COVID-19 pandemic. Previous research included the behavior of millennial consumers in using online food delivery (OFD) services [18], the primary factors contributing to their satisfaction during the pandemic [19], and their lifestyle regarding healthy food consumption [20]. However, there is still limited research on how the purchasing behavior of food products has changed during and after the pandemic for millennial consumers.

Based on the brief background, it is necessary to study further how millennial consumers purchase food products through online platforms, especially post-COVID-19 pandemic. Therefore, this research explores purchasing behavior and the factors related to millennial consumers' online food expenditure post-COVID-19 pandemic. This research is expected to contribute insights into the shopping behavior of the millennial generation, particularly in purchasing food products through online platforms in the future.

2 Research method

This study utilized a descriptive-analytical survey research design. Structured interviews were conducted with respondents selected via questionnaires to collect facts, opinions, and behaviors. The descriptive method aims to systematically and accurately elaborate the current status of groups, objects, conditions, or events [21]. This study focused on food consumers with at least one experience purchasing products through an online marketplace. Additionally, the study included only respondents aged 16 and older, as individuals at this age begin to develop purchasing behaviors and preferences for a variety of goods and services [22].

A structured online questionnaire was created using Google Forms and distributed to respondents. The sample was drawn from social networking platforms like WhatsApp, Facebook, and Instagram and randomly distributed to individuals willing to participate. Out of 186 participants, 182 samples were validated for further analysis. This study adopted the view that millennials are the generation born between 1981 and 1996, with their ages ranging from 27 to 42 in 2023, the time when the data for this study were collected [6,23,24].

Frequency analysis was conducted to investigate the sustainable purchasing behavior of millennial consumers [25]. This method is commonly employed to assess consumer perceptions and is applied in various disciplines, such as linguistics and statistics, to analyze the distribution of elements within a dataset [26]. Moreover, to examine factors related to millennial consumers' online food expenditure, this study deployed ordinary least square (OLS) and log-log regression [27].

3 Results and discussion

3.1 Demographic of millennial consumers

The respondents of this study were millennial consumers who have experienced at least once to purchase food products using online platforms. Seven variables describe the respondent demographic profile, including gender, age, education, residential area, income, food expenditure and occupation. The details of the respondents are presented in Table 1.

Table 1. Respondent demographic profile (N=182)

Variable	Range	Respondent	
		Number	%
Gender	Male	86	47.3%
	Female	96	52.7%
Age	Early millennials	41	22.5%
	Late millennials	141	77.5%
Education	Junior High School	1	0.5%
	Senior High School	19	10.4%
	Diploma	11	6.0%
	Undergraduate	122	67.0%
	Graduate	29	15.9%
Residensial area	Urban	123	67.6%
	Suburban	52	28.6%
	Rural	7	3.8%
Income (IDR/month)	Low (under IDR 2.5 million)	30	16.5%
	Lower-middle (IDR 2.5-5 million)	58	31.9%
	Middle (IDR 5-10 million)	68	37.4%
	Upper-middle (IDR 10-20 million)	22	12.1%
	High (IDR 20 million above)	4	2.2%
Food expenditure (IDR/month)	Low (≤ IDR 500,000)	83	45.6%
	Medium (IDR 500,001 - 1.5 million)	41	22.5%
	High (≥ IDR 1.5 million)	58	31.9%
Ocupation	Student	2	1.1%
	Professional	104	57.1%
	Entrepreneur	46	25.3%
	Government official	24	13.2%
	Others	6	3.3%

Table 1 indicates that females dominated the respondents, totaling 96 (52.7%) from 182. Previous studies have depicted that female consumers were likely to make more purchases on online platforms compared to male consumers [28]. Additionally, women are more likely to participate in online shopping because they are typically more network-oriented, whereas men are generally more focused on completing tasks [29]. Furthermore, most respondents were late millennials, aged between 27 and 34. Age is one of the primary factors influencing variations in the attitudes and behaviors of consumers [30]. There are different definitions of the millennial generation based on age. Several scholars defined millennials as those who were born between 1980 and 2000 [31], while others specified the range as 1981 to 1997 [32]. Additionally, some sources identified millennials as individuals born between 1981 and 1996 [6,23,24]. This research adopted the latter definition.

Regarding educational background, this study discovered that most respondents possessed a bachelor's degree, followed by those with a senior high school education. Additionally, a notable number of respondents had completed graduate studies. Moreover, most resided in urban areas, with fewer living in suburban and rural regions. The most common income bracket among respondents was the middle-income category (IDR 5-10 million), followed by the lower-middle income category (IDR 2.5-5 million). Only a small proportion of respondents fell into the high-income category. In addition, most millennials allocate less than 500,000 rupiah per month for food expenses. Previous studies have highlighted that high-income consumers tended to purchase more food online [33].

In conclusion, the demographic profile of the respondents was diverse, with a slightly higher number of female participants. Most were late millennials with a bachelor's degree. The majority lived in urban areas, with the income distribution showing a concentration in the middle-income range, and the largest occupational group was professionals, with a monthly food expenditure below IDR 500,000. This demographic profile provides a broad view of the millennial food consumer, which is essential for understanding their behavior in purchasing food online.

3.2 Millennials' consumer behavior in purchasing food online

This study discussed several aspects of understanding millennial consumers' online purchasing behavior of food products. The analysis focused on the frequency of purchasing food products, the reasons for purchasing, the types of products bought, the devices used for transactions, and the online platforms utilized.

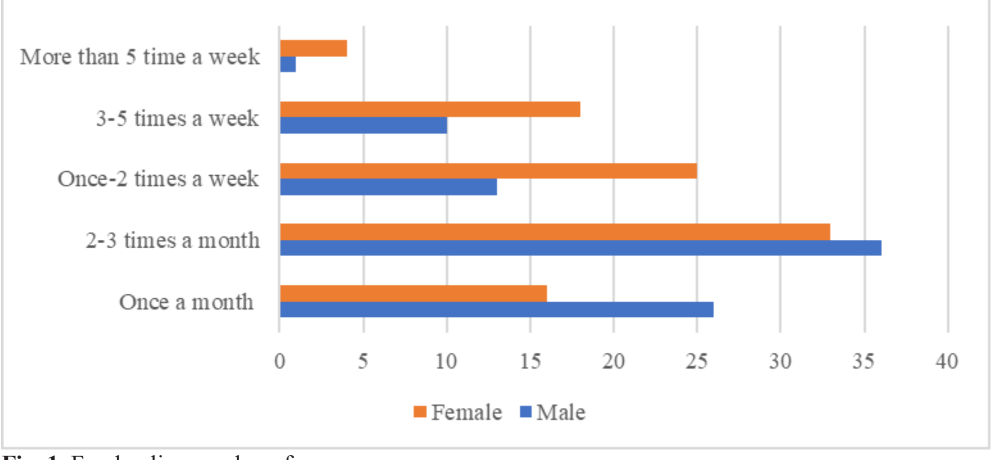

Fig. 1. Food online purchase frequency

Fig.1 displays that most millennial consumers in this study purchased food online 2-3 times a month, making up about 37.9% of the respondents. Male millennial consumers predominantly purchased food online once a month and 2-3 times a month, while females demonstrated higher frequency in the "3-5 times a week" and "once to twice a week" categories. The highest purchase frequency for both genders was 2-3 times a month. However, more female millennials purchased food online 3-5 times a week and more than five times a week, suggesting a higher frequency of online food purchasing among female respondents. The higher frequency of shopping among female consumers compared to male consumers may be attributed to the wide range of options offered in online food shopping.

Previous studies indicate that women's enjoyment of online shopping is fueled by the extensive variety of products available [34]. Previous research states that several factors influenced the frequency of purchasing food products among millennial consumers, including accessibility, price fairness, and environmental concerns [35].

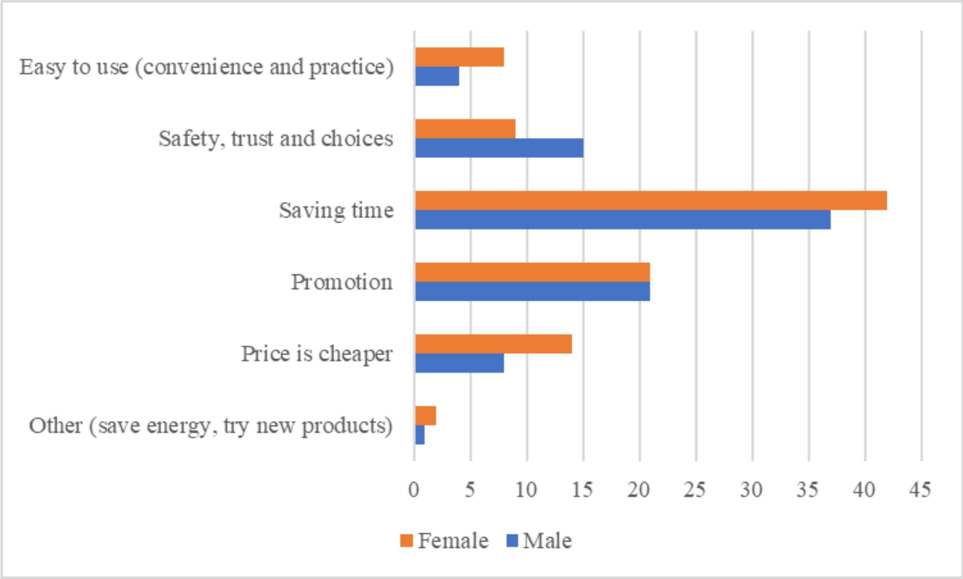

Fig. 2. Reasons to purchase online food

Moreover, Fig. 2 illustrates that both male and female respondents primarily purchased food online to save time, with nearly equal numbers prioritizing this reason. Promotions were also a significant motivation for both genders. Female respondents emphasized convenience and lower prices slightly, while male respondents were more concerned with safety, trust, and choices. The last category was the least selected by both genders, indicating that reasons such as saving energy and trying new products were less influential. Overall, time-saving and promotional offers were the top motivators for online food purchases among both male and female respondents. The reason for saving time is a form of convenience motivation, as it allows consumers to avoid purchasing directly from the food store. Convenience motivation is one of the primary reasons people purchase online [36].

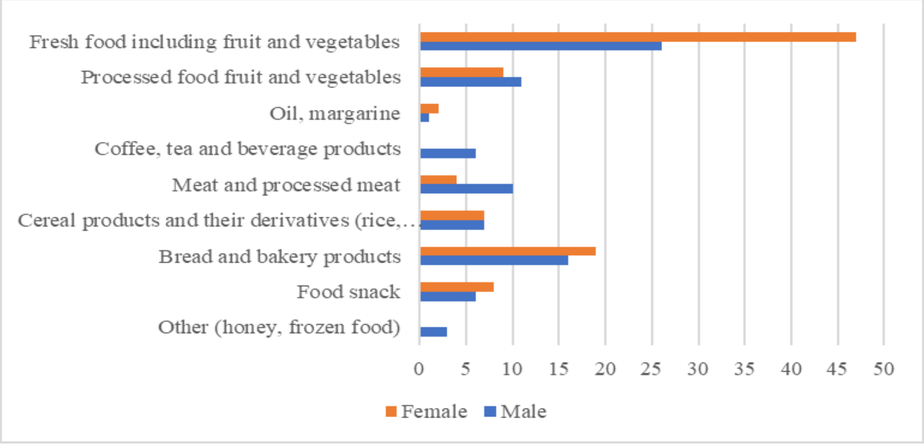

Fig. 3. Food online purchased product category

https://doi.org/10.1051/e3sconf/202459501012

Fig. 3 exhibits the types of food products purchased by millennial consumers. The data revealed that fresh food, including fruits and vegetables, was the top choice of online purchases for both male and female millennial consumers (70.2%), with females purchasing slightly more than males. Bread and bakery products, processed fruits and vegetables, and snacks were also commonly purchased. Males purchased more coffee, tea, beverage products, meat, and processed meat than females. Conversely, females purchased oil, margarine, and other miscellaneous products. Overall, the preferences for online food purchases indicate variations between genders, with a strong inclination toward fresh produce and bakery items for both. These data highlight the preferences of millennial consumers in online food shopping, with an apparent domination of fresh and processed fruits and vegetables.

Moreover, Fig. 4 demonstrates the devices used by millennial consumers to purchase food. The data disclosed that smartphones were millennials' predominant device for purchasing food online (74.7%), with female usage slightly higher (39.6%). Tablets and personal computers were the second most used devices, with a moderate number of respondents using them. Laptops were less commonly used, and either gender rarely used other devices. It suggests a strong preference for mobile convenience, particularly smartphones, among male and female respondents regarding online food shopping. Previous studies have revealed that smartphones were the most popular device chosen by young consumers for online purchases due to their convenience [37].

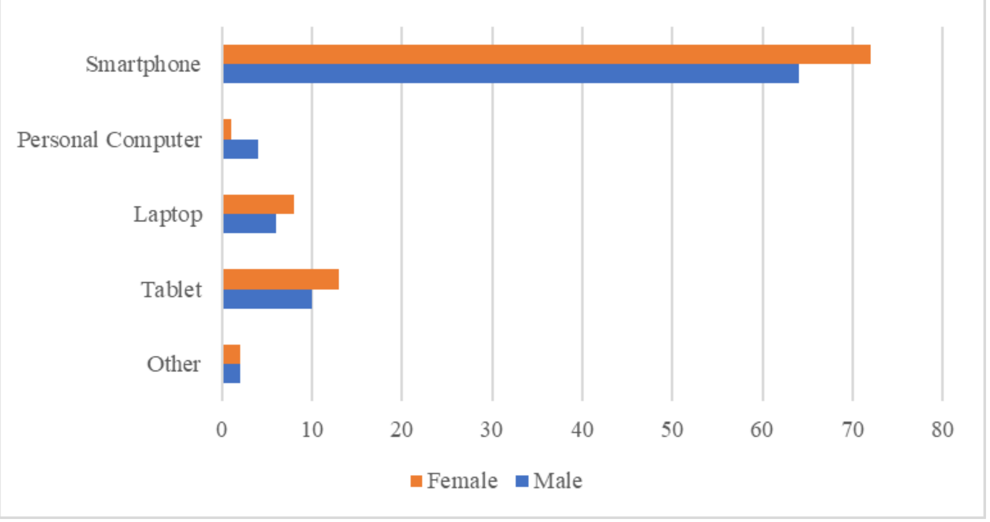

Fig. 4. Device used by millennial consumers to purchase food

In addition, Fig.5 portrays the platforms used by millennials to purchase food. In this case, marketplaces such as Shopee, Tokopedia, and Lazada emerged as the most preferred online platforms for purchasing food among male and female millennial consumers (74.7%), with a slightly higher preference among females (42.3%). Food delivery applications and social media platforms were the second most popular options, with a higher usage among males—only a few utilized specific websites and other platforms. Hence, established marketplaces, with varying platform preferences, were the dominant choice for online food shopping for both genders. Shopee, Tokopedia, and Lazada are Indonesia's most visited online marketplaces [38]. Data from 2023 disclosed that the Shopee site received 2.33 billion visits, Tokopedia attained 1.25 billion visits, and Lazada obtained 762.4 million visits [39].

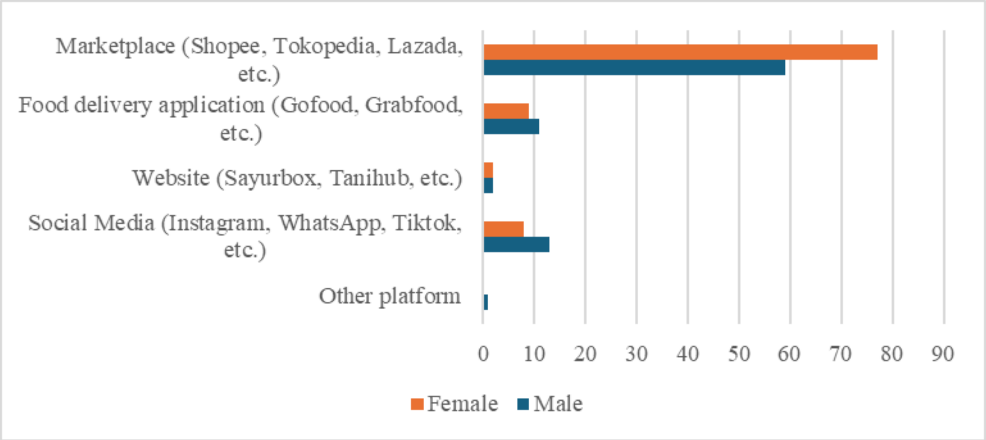

Fig. 5. Online platforms to purchase food

In conclusion, these data provided valuable insights into respondents' online food purchasing behavior. Millennial shoppers purchased food online at a frequency of 2-3 times a month. The primary motivation for these purchases was to save time. Fresh foods, including fruits and vegetables, were the most popular online products purchased. Smartphones were the preferred device deployed for these transactions. Among online platforms, respondents commonly utilized marketplaces like Shopee, Tokopedia, and Lazada.

3.3 Online food expenditure of millennial consumer

This study aims to analyze the extent of millennial consumers' expenditure on food products purchased through online platforms to gain a comprehensive picture of their shopping behavior. The primary variable of interest is how changes in purchasing frequency before and after the pandemic influence online food product spending. Meanwhile, gender, income, education, online experience, and purchase frequency act as control variables. OLS and log-log regression were performed to explore millennial consumers' expenditure on online food purchases.

Table 2 displays the regression results, providing insights into online food expenditure determinants using OLS and log-log models. The coefficient for gender (female) was negative in both models, indicating that being female is associated with a decrease in online food expenditure. However, this effect was not statistically significant. Previous studies suggest that while women shop more frequently than men, they tend to purchase lower-cost items, leading to lower total spending compared to male consumers [10]. The other control variable, such as income, had a positive but insignificant effect. Education and age also depicted no significant impact on online food expenditure. Similarly, in the online experience variable, none of the levels (2 to 5) demonstrated significant differences compared to the reference level (level 1) in both models, showcasing that having an online experience insignificantly influenced the millennial generation's expenditure on purchasing food products. In the context of online shopping, prior shopping experience often has minimal impact as long as there is institutional trust in the seller, with trust being the key factor for both seasoned and new online shoppers [40].

Table 2. Regression results

Variable	Expenditure (OLS)	Log(Expenditure) (Log-Log)
Gender (Female)	-415587 (281733.1)	-0.176 (0.195)
Income	0.00229 (0.00874)	0.038 (0.098)
Education	-52553.2 (60386.4)	-0.063 (0.710)
Age	4396.71 (32549.33)	-0.989 (0.821)
Online Experience (Ref: 1)		
- Level 2	249812.9 (328959.1)	0.007 (0.248)
- Level 3	199623.6 (421263.8)	-0.099 (0.301)
- Level 4	359245.4 (395334.2)	-0.046 (0.272)
- Level 5	415289.3 (383816.8)	0.296 (0.314)
Purchase Frequency (Ref: 1)		
- Level 2	311437.6 (334694.4)	0.454* (0.255)
- Level 3	605309 (457449.1)	0.477 (0.342)
- Level 4	927732.3** (456533.1)	0.945*** (0.349)
- Level 5	3402726* (1791830)	1.657*** (0.567)
Frequency Change (Ref: 1)		
- Level 2 (same as pandemic)	387197.4 (297340.7)	0.531** (0.253)
- Level 3 (higher than pandemic)	836890.9** (417571.6)	0.764*** (0.286)
R-squared	0.1803	0.2012
F(14, 167)	2.3000	3.7500
Prob > F	0.0067	0.0000
Number of obs	182	182

*Note:***, **, and * denote significance at the 1%, 5%, and 10%. Robust standard error are in parenthesis*

In addition, levels 2, 4 and 5 exhibited a significant positive effect regarding purchase frequency, suggesting that higher purchase frequency has been associated with a substantial increase in online food expenditure. Purchase frequency is one of the critical factors in understanding the behavior of millennial consumers [41]. Furthermore, frequency change levels 2 and 3 also significantly positively affected online food expenditure. The tendency of millennial consumers to rise in purchasing frequency may be due to their satisfaction with the e-service quality and food quality of the products they consume [8].

Overall, the regression models revealed that higher purchase frequency and changes in frequency after the pandemic were significant drivers of increased online food expenditure among millennial consumers. The findings highlight the importance of purchase behavior in understanding online food expenditure patterns.

4 Conclusions and recommendation

This research provides valuable insight into how millennial consumers purchase food online, especially during the COVID-19 pandemic. In conclusion, the demographic analysis unveiled that most respondents were late millennials with at least a bachelor's degree, predominantly living in urban areas and falling within the middle-income bracket. The largest group by occupation was professionals, with monthly food expenditures typically below IDR 500,000. The study highlights critical aspects of millennial online food purchasing behavior, noting that they most frequently purchased food online 2-3 times a month, mainly to save time. Fresh foods, such as fruits and vegetables, were the most commonly purchased items. Smartphones were preferred for these transactions, and marketplaces were the most utilized online platforms. Regression analysis revealed that increased purchase frequency and post-pandemic changes in purchasing habits triggered higher online food expenditures among millennial consumers.

The study has several limitations. First, the sample size and demographic scope were limited, predominantly focusing on late millennials with at least a bachelor's degree residing in urban areas. This may only partially represent the diverse experiences of millennials in different geographic and socioeconomic contexts. Additionally, the study primarily relied on self-reported data, which could be subject to biases and inaccuracies. The scope of the research did not extensively explore the impact of varying regional economic conditions or cultural differences on purchasing behaviors. Hence, future research should address these limitations by incorporating a more diverse sample involving a broader range of geographic locations, educational backgrounds, and income levels. Expanding the scope to include different generational cohorts and comparing their online purchasing behaviors could provide deeper insights. Additionally, future studies should consider employing mixed methods, combining quantitative data with qualitative interviews, to capture a more comprehensive understanding of consumer behavior.

Acknowledgment. This study was financially supported by the Institute of Research, Publication and Community Service of Universitas Muhammadiyah Yogyakarta. The authors thank the Department of Agribusiness research team who assisted with the data collection.

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