

Rice Demand and Its Predictions as a Basis for Realizing Food Security Programs in Higher Education Institutions

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ABSTRACT

The demand for rice is a form of community needs that must be met because rice is the main food need. For this reason, the number of requests must be known as a reference in fulfilling them. This study aims to determine the variables that affect the demand for rice in higher education institutions, Swadaya Gunung Jati University Cirebon, and predict the amount of demand as the basis for the realization of the food security program. The research was carried out for 5 months, starting from May to September 2022. Quantitative research design with survey method. The research population is rice consumers at the higher education institution of Swadaya Gunung Jati University Cirebon, amounting to 656 people and the number of samples is determined by 87 respondents. The sampling technique was proportionate stratified random sampling. Data analysis using multiple linear regression instruments with the help of the IBM SPSS Statistics version 25 for windows program in the calculation process. The results of the study concluded that the variables of price, taste, income, and number of family dependents simultaneously affect the amount of rice demand at the higher education institution of Swadaya Gunung Jati University Cirebon, while partially only the variable number of family dependents has an effect. Prediction of the amount of rice demand is based on these influential variables so that it can be determined at 6,200 kg/month. The results of this study are theoretically useful for scientific development and technically useful for efforts to realize food security programs in higher education institutions in general throughout Indonesia.

Keywords: cirebon, food security program, higher education institutions, prediction, rice demand

INTRODUCTION

Sustainability of life for a country in this world is very dependent on guaranteed food availability for its citizens. Likewise, Indonesia as a large country with a dense population, its existence also depends on guaranteed food availability, which is generally in the form of rice. Rice is a staple food that the body needs because it has many benefits, including: high carbohydrates, vitamin and mineral content, and various levels of amylose and amylopectin (1). Therefore, rice is a food item that is in very high demand for the people of Indonesia and several countries in other Asian continents.

Alimoeso (2011) explains that 95% of Indonesian people depend on rice for their food supply so that rice has become a

serious concern by the government, especially in terms of ensuring its availability (2). The guarantee of the availability of rice for its citizens can show national dignity and sustainability (3). In addition, rice also has a strategic role in economic security, national political stability, and food security (4).

Rice consumption in Indonesia always increases every year and this demand for rice must be met as well guaranteed procurement, meaning if not met, it can have an impact on the emergence of hunger, poverty and malnutrition in the younger generation and can trigger crime in the food sector (5). These impacts can be eliminated if food security, both at the individual level and at the level of institutions throughout

Indonesia is always guaranteed, both physically and legally (by law).

Referring to Law No. 18 of 2012 concerning Food, the central government and local governments are responsible for food availability. Thus, the government is also responsible for the needs and availability of food for the people in their respective regions to achieve food independence. Not only to the availability or needs of the community, the government is also obliged to guarantee sufficient, safe, quality, and well-nourished food for the people. The guarantee reaches the individual or organizational/institutional level (6).

To realize food security in Indonesia that is equitable for every citizen, it is not only at the central government level, regional government, but can be started from the agency or agency level, namely by ensuring the availability of food for employees or employees. Thus the mandate of Law No. 18 of 2012 concerning Food, can be gradually realized. An agency or institution exists that has implemented a food security program so that its employees are guaranteed daily food availability.

The results of research by Al_Rasyid (2020) and Oktaviani (2012) show that there is an institution or institution that has implemented a resilience program food for its employees, namely in the government agency of Kulon Progo Regency, Special Region of Yogyakarta. Every month, the supply of food (rice) for employees is guaranteed by the Kulon Progo Regency Government. The rice is purchased directly from local farmers, so it can help economic growth based on local wisdom (7,8). Kulon Progo Regency has provided good guidelines in implementing food security programs at the institutional level so that it should be imitated by other institutions throughout

Indonesia, including in higher education institutions.

Swadaya Gunung Jati University Cirebon is one of the institutions or higher education institutions located in Cirebon City, West Java Province. This institution was founded in 1961 and by 2021 has overshadowed the lives of 656 people, consisting of 230 employees and 426 lecturers (9). Regarding employee and lecturer data for 2019-2021 in more detail, it can be seen in Table 1.

Table 1 shows that the number of lecturers and employees at the higher education institution of Swadaya Gunung Jati University Cirebon from 2019-2021 is quite large and it is clear that they need food in the form of rice in their daily lives. However, since the establishment of this institution until now (in 2022), there has been no effort to realize a food security program at the institutional level. Therefore, the mandate of Law Number 18 of 2012 has not been implemented, even though the potential to make it happen exists, among others: the availability of local food resources, human resources, technology and managerial resources.

To realize a food security program at the level of higher education institutions, Gunung Jati Swadaya University, Cirebon as mandated by Law No. 18 of 2012, the amount of rice consumption needs for employees and lecturers must be fulfilled or guaranteed in a proper, safe, quality, balanced and nutritious manner. sustainable. To ensure the supply of rice needs and availability, it is very important to do research on rice demand as the first step to realize a food security program at the Swadaya Gunung

Jati University, Cirebon. The importance of research related to rice demand has also been carried out by many previous researchers, both from within the country and abroad, including: 1) Kusumaningrum et. al (2022), analysis of

factors affecting the demand for C4 rice in Surakarta (10); 2) Bairagi et.al (2021) regarding “What drives consumer demand for packaged rice? Evidence from South and Southeast Asia”(11); 3) Asih (2021) on the factors that influence the demand for rice in Gorontalo City(12); 4) Sartini and Bagio (2021) on the factors that influence the demand for rice in Aceh Singkil(13); 5) Kouekam et.al (2018) on

“Determinants of Demand for Rice with Implications for Peri-Urban Household Food Security in Southwestern Cameroon”(14); 6) Lovita and Fauzi (2018) regarding the demand for rice in Padang City, West Sumatra(15); and 7) Ningsih et al (2018) regarding the demand for glutinous rice at the Lambaro Main Market, Aceh Besar District (16).

Table 1 Data on employees and lecturers at higher education institutions, Swadaya Gunung Jati University Cirebon in 2019-2021

Work unit	Employee and Lecturer Data					
	2019		2020		year 2021	
	Employee	Lecturer	Employee	Lecturer	Employee	Lecturer
Faculty of Law	11	33	11	32	11	32
Faculty of Economics-Business	14	82	14	81	14	74
Fac. Keg. Educational Science	15	103	15	102	14	97
Fac. Social Sciences and Culture	11	37	11	36	10	23
Faculty of Agriculture	10	24	10	24	10	23
Faculty of Engineering	10	37	10	37	10	43
Medical School	33	103	32	104	33	110
Postgraduate	8	31	7	31	6	24
Foundation	15	-	15	-	15	-
University	104	-	105	-	107	-
Amount	231	450	230	447	230	426

Source:Staffing of Swadaya Gunung Jati University Cirebon, 2022(9)

Based on the results of the previous studies above, in this study there is a research gap in the form of a population gap. Population gap is a difference in the type of research population(17), where the population in this study were employees and lecturers at the educational institution of Swadaya Gunung Jati University, Cirebon City, West Java Province, while the population in previous studies was not in educational institutions. The existence of research gaps indicates that this research has originality so that it can be useful or contribute to the development of science, especially consumer behavior and can

contribute as a technical reference for parties related to rice. The objectives of this study are: to determine the variables that affect the demand for rice in higher education institutions and predict the amount of rice demand. Related to the research objectives, the hypothesis proposed is based on the theory of demand, namely: variable price, taste, income and number of family dependents have a significant simultaneous and partial effect on rice demand in higher education institutions at the Gunung Jati Swadaya University.

The results of this study can be the basis for realizing a food security program

at the educational institution of the Gunung Jati University, Cirebon City. Therefore, it is hoped that later it can be followed up in real terms by institutions or institutions in the context of realizing good things, namely fulfilling the mandate of Law Number 18 of 2012 concerning Food. The title of this research is: Rice Demand and Its Predictions as A Basis For Realizing Food Security Programs In Higher Education Institutions.

MATERIAL AND METHODS

The location of this research was determined purposively, namely at the higher education institution of Swadaya Gunung Jati University Cirebon, basis on

the consideration that the institution already has relatively many employees but there is no food security device or instrument. The research was carried out for five months, starting from May to September 2022. The research design was quantitative with a survey method. The population in this study were employees and lecturers at higher education institutions at the Swadaya Gunung Jati University Cirebon, amounting to 656 people so the technique for determining the sample size was based on the Slovin formula (18), namely: 87 respondents. The sampling technique was carried out by proportional stratified random sampling, as can be seen in Table 2.

Table 2 Proportionate stratified random sampling on employees and lecturers

No	Work Unit	Year 2021			
		Total population		Number of samples	
		Employee	Lecturer	Employee	Lecturer
1	Faculty of Law	11	32	1	4
2	Faculty of Business Economics	14	74	1	11
3	Faculty of Teacher Training and Education	14	97	1	13
4	Faculty of Socio-Cultural Sciences	10	23	1	3
5	Faculty of Agriculture	10	23	1	3
6	Faculty of Engineering	10	43	1	6
7	medical School	33	110	4	16
8	Postgraduate	6	24	1	3
9	Foundation	15	0	2	0
10	University	107	0	15	0
Amount		230	426	28	59

Data collection techniques consist of primary data and secondary data (19). Primary data in the form of data obtained from survey results to respondents and then analyzed to obtain conclusions. Secondary data in the form of data obtained from other parties to support research, among others: national rice consumption data from BPS and employee data from higher education institutions.

Operationalization of research variables aims to define the variables firmly so that it is easy to measure (20). In this

study, the operational definition of the variables consists of:

1. Price (X_1) is the price of rice purchased by the respondent, measured in units of rupiah per kg (Rp/kg).
2. Taste (X_2) is the type of rice that respondents generally buy, namely IR type rice and non-IR type rice (a type of rice whose price is higher than IR type rice, for example, Pandan Wangi type rice or Mentik Wangi type rice) measured by a number nominal, namely,

- 1 = IR type rice or 0 = Non-IR type rice
- Income (X_3) is the respondent's income in the form of basic salary, allowances, and other additional income, measured in units of rupiah per month (Rp/month)
 - The number of family dependents (X_4) is the number of family members of the respondent who consume rice every day, measured by the discrete numbers namely 1, 2, 3, ...person
 - Rice demand (Y) is the amount of rice purchased by respondents every month, measured in kg per month (Kg/month)
 - To provide clarity regarding the operational definition of the variables above, it can be seen in Table 3.

Table 3 Operationalization of research variables

Price of rice (X_1)	Rp/Kg	Ratio
Taste (X_2)	1 = IR; or 0 = Non-IR	Nominal
Revenue (X_3)	IDR/month	Ratio
Number of family dependents (X_4)	Person	Ratio
Rice demand (Y)	Kg/month/family	Ratio

Data analysis used multiple linear regression instruments which aim to determine the effect of independent variables (X) in the form of price (X_1), taste (X_2), income (X_3), and number of family dependents (X_4) on rice demand (Y) (21). To facilitate the analysis, the IBM SPSS Statistics version 25 program was used for windows. The form of the multiple linear regression equation in question, namely:

$$Y = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + e$$

Information:

Y = Rice demand (Kg/month/family)

b_0 = Intercept coefficient (constant)

b_1, b_2, b_3, b_4 = Regression coefficient of variable X

X_1 = Price (Rp/Kg)

X_2 = Taste (dummy variable) namely, 1 = IR type rice or 0 = Non-IR type rice (Pandan Wangi or Mentik Wangi type rice)

X_3 = Income (Rp/month)

X_4 = Number of family dependents (persons)

e = error

Hypothesis testing is carried out based on the following criteria (22):

* H_0 is accepted if the value of sig. > 0.05

* H_0 is rejected if the value of sig. < 0.05

RESULT

A. Classic assumption test

Before presenting the results and discussion, the results of the classical assumption test will be presented. This test aims to obtain a regression estimation model that is accurate, unbiased, and consistent before performing multiple linear regression analysis (22). The classical assumption test used in this study, namely the data normality test, multicollinearity, and heteroscedasticity with the following results:

1. Normality test

This test aims to determine whether in the regression model the dependent and independent variables have a normal distribution or not. This test uses-parametric Kolmogorov-Smirnov (KS) test where if the probability value is greater than 0.05 then the data is normally distributed, but if the probability value is less than 0.05 then the data is not normally distributed (23). The results of this test can be seen in the Table 4.

Table 4 Test Results *Kolmogorov-Smirnov (KS)*
One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		87
Normal Parameters, b	Mean	.0000000
	Std. Deviation	2.95251684
Most Extreme Differences	Absolute	.086
	Positive	.086
	Negative	-.069
Test Statistics		.086
Asymp. Sig. (2-tailed)		.158c

Source: Output SPSS Statistics version 25 for windows

Table 4 shows that the results of the Kolmogorov-Smirnov test have a significance or probability value of 0.158, greater than 0.05, so it can be stated that all data are normally distributed.

2. Multicollinearity Test

This test aims to determine whether the regression model found a correlation between the independent

variables (independent), using the correlation matrix of the independent variables, if the tolerance value is > 10% and the VIF value is < 10, it can be concluded that there is no multicollinearity between the regression independent variables. The results of the multicollinearity test can be seen in Table 5.

Table 5 Multicollinearity test results

		Coefficients a					
		Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics	
Model		B	Std. Error	Beta	t	Sig.	Tolerance
1	(Constant)	10,241	7,465		1.372	.174	
	Price	-.208	.609	-.043	-.342	.733	.391
	Taste	.484	1.133	.054	.427	.670	.391
	Income	.100	.101	.085	.995	.323	.850
	Number of family dependent	2,636	.346	.648	7.629	.000	.863

Source: Output SPSS Statistics version 25 for windows

Table 5 shows that none of the independent variables has a tolerance value of more than 0.1, which means that there is no correlation between the independent variables whose value is more than 95%, while the Variance Inflation Factor (VIF) value also shows that there is no independent variable that has a VIF value. less than 10 so it can be stated that there is no multicollinearity. These results are the same as the results

of Kristinae (2018) research which states that in the multicollinearity test there is no multicollinearity (24).

3. Heteroscedasticity Test

This test aims to determine whether in the regression there is an inequality of variance from the residuals of one observation to another, by observing a scatterplot graph with a pattern of dots that spread above and

below the Y axis. The results of the

heteroscedasticity test can be seen in Figure 1.

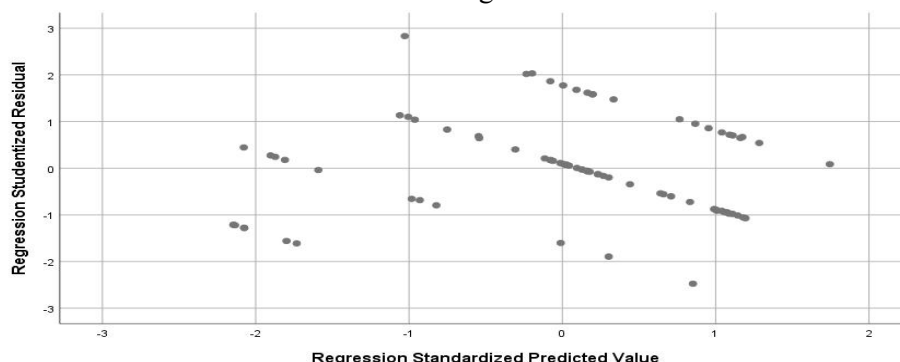


Figure 1 Scatterplot

Source: Output SPSS Statistics version 25 for windows

Figure 1 shows that the points spread randomly and are spread both above and below zero on the Y axis so that it can be stated that there is no heteroscedasticity.

Based on the results of the classical assumption test above, it can be stated that the data is normally distributed, does not occur multicollinearity and does not occur heteroscedasticity so that it can be continued to perform regression analysis.

B. Descriptive analysis

Descriptive analysis is an analysis conducted to assess the characteristics of

a variable data, but not to draw conclusions (25); (20). Examples of data characteristics referred to include the maximum value, minimum value, range, mean, and standard deviation (25). In this descriptive analysis includes:

1. Variable condition of rice demand (Y)

In the variable demand for rice (Y), the highest value is 25 and the lowest is 10, so the range is 15. The distribution of respondents based on this variable can be seen in Table 6.

Table 6 Distribution of respondents based on the number of requests for rice, mean and standard deviation

No	Rice demand (Kg/month)	Frequency (person)	%	Means	Standard deviation (Sd)
1	21 to 25	20	23	19.7	4.13
2	16 to 20	49	56		
3	10 to 15	18	21		
Amount		87	100		

Table 6 shows that the demand for rice is mostly in the range of 16 to 20 kg/month by 56%, then in the range of 21 to 25 kg/month (23%) and the lowest is in the range of 10 to 15 kg/month by 21%. The mean value is 19.7 and the standard deviation value is 4.13 (the standard deviation value is smaller than the mean

value) so that the respondent's data on this variable is homogeneous or can represent the population (21).

2. Variable condition of rice price (X_1)

In the rice price variable (X_1), the highest value is 12,500 and the lowest is

10,000 so the range is 2,500. The distribution of respondents based on this variable can be seen in Table 7.

Table 7 Distribution of respondents based on rice prices, mean and standard deviation

No	Price of rice (Rp/kg)	Frequency (person)	%	Means	Standard deviation (Sd)
1	11,667 to 12,500	27	31	11,068.97	856.48
2	10,833 to 11,666	26	30		
3	10,000 to 10,832	34	39		
Amount		87	100		

Table 7 shows that most of the respondents buy rice at a price range of Rp. 10,000.-/kg to Rp. 10,832.-/kg as much as 39%, then in the price range of Rp. 11,667.-/kg to Rp. 12,500.-/kg (31%) and the lowest is in the price range of Rp. 10,833.-/kg to Rp. 11,666.-/kg by 30%. The mean value is 11,068.97 and the standard deviation value is 856.48 (the standard deviation value is smaller than the mean value), so that the respondent's

data on this variable is homogeneous or can represent the population.

3. Variable condition of rice taste (X_2)

In the rice taste variable (X_2), the most were type IR rice, namely 70%, and then non-IR type rice (Pandan Wangi or Mentik Wangi) by 30%. The distribution of respondents based on this variable can be seen in Table 8.

Table 8 Distribution of respondents based on the type of rice purchased

No	Rice type	Symbol	Frequency (person)	%
1	IR	1	61	70
2	Non-IR (Pandan Wangi or Mentik Wangi)	0	26	30
Amount			87	100

Table 8 shows that most of the respondents prefer to buy IR rice (1) rather than Non-IR rice (0). This is because the price is cheaper, more available in the market and the quality of the rice is also considered good.

4. Income variable conditions (X_3)

In the respondent's income variable (X_3), the highest value is 20,000,000 and the lowest is 4,000,000 so the range is 16,000,000. The distribution of respondents based on this variable can be seen in Table 9.

Table 9 Distribution of respondents based on income, mean and standard deviation

No	Income (Rp/month)	Frequency (person)	%	Means	Standard deviation (Sd)
1	14,800,000 to 20,000,000	10	11	10,452,874	3,518,253
2	9,400,000 to 14,700,000	45	52		
3	4,000,000 to 9,300,000	32	37		
Amount		87	100		

Table 9 shows that most respondents' income (52%) is in the range of Rp. 9,400,000.-/month to Rp. 14,700,000.-/month, then in the range of Rp. 4,000,000.-/month to Rp. 9,300,000.-/month (37%) and the lowest is in the range of Rp. 14,800,000.-/month to Rp. 20,000,000.-/month by 11%. The mean value is 10,452,874 and the standard deviation value is 3,518,253 (smaller than the mean) means that the

respondent's data on this variable is homogeneous or can represent the population.

5. Variable condition of the number of family dependents (X_4)

In the variable number of family dependents (X_4), the highest value is 6 and the lowest is 2, so the range is 4. The distribution of respondents based on this variable can be seen in Table 10.

Table 10. Distribution of respondents based on number of family dependents, mean and standard deviation

No	Number of family dependents	Frequency (person)	%	Means	Standard deviation (Sd)
1	5 to 6	1	1		
2	3 to 4	64	74	3.94	1.02
3	1 to 2	22	25		
Amount		87	100		

Table 10 shows that the number of family dependents of the respondent's family is mostly (74%) in the range of 3 to 4 person, then in the range of 1 to 2 person (25%) and the lowest is in the range of 5 to 6 person (1%). The mean value is 3.94 and the standard deviation value is 1.02 (smaller than the mean) meaning that the respondent's data on this variable is homogeneous or can represent the population.

C. Regression Analysis

The regression analysis will be discussed simultaneous test, coefficient

of determination, and partial test. The results and discussion are as follows:

1. Simultaneous Test (F-Test)

The simultaneous test (F test) aims to see the significance of variable X (price, taste, income, and number of family dependents) simultaneously on the number of requests for rice Y. The results of the simultaneous test based on the output of SPSS 25 can be seen in Table 11.

Table 11 Simultaneous test results (F-Test)

ANOVA a						
	Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	718,124	4	179,531	19,637	.000 b
	Residual	749,693	82	9.143		
	Total	1467,816	86			

a. Dependent Variable: Rice demand

b. Predictors: (Constant), Number of family dependents, Taste, Income, Price

Source: Output SPSS Statistics version 25 for windows

Table 11 shows that the value of sig. of $0.000 < 0.05$ means that variable X (price, taste, income, and the number

of family dependents) simultaneously has a significant effect on variable Y (rice demand), so H_0 is rejected. Such a

condition is because the Y variable is a variable that is influenced by the X variables which are often conveyed in demand theories. These results are by Lovita's research (2018) which concludes that variables of rice prices, corn prices, and population have a simultaneous effect on the demand for rice in the city of Padang (15) and the results of Laily's research (2017) which concludes that income variables, rice prices, instant noodle prices, number of family members and consumer tastes have a

significant effect on rice demand in Kudus Regency simultaneously (26).

2. Coefficient of Determination (R^2)

The coefficient of determination (R^2) is a value that indicates the magnitude of the effect of variable X (price, taste, income, and number of family dependents) on Y (rice demand) as a whole (21). The coefficient of determination in this study can be seen in Table 12.

Table 12 Coefficient of determination (R^2)

Model Summary b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.699a	.489	.464	3.02367	2,373

Source: Output SPSS Statistics version 25 for windows

Table 12 shows that the coefficient of determination (R^2 is 0.489 or 48.9 %, meaning that the X variable (price, taste, income, and number of family dependents) affects the Y variable (rice demand) by 48.9 % and the rest is 51.1% influenced by other variables not examined. The R^2 value of 48.9 % is included in the "enough" category (23) and this value is better than the R^2 value in the research results of Asih et. al (2021) which amounted to 24.4% (12) and also the research results

of Zaini et. al (2019) whose R^2 value is only 12.2% (27), but it is inferior to the results of Kristinae's research (2018) which has an R^2 value of 80.2 % (24).

3. Partial Test (t Test)

A partial test (t-test) aims to determine the effect of variable X (price, taste, income, and number of family dependents) partially on Y (rice demand)(21). Partial test results can be seen in Table 13.

Table 13 Partial test results (t test)

Coefficients a					
Model		Unstandardized Coefficients		Standardized Coefficients	Sig.
		B	Std. Error	Beta	
1	(Constant)	10,241	7,465		.174
	Price	-.208	.609	-.043	.733
	Appetite	.484	1.133	.054	.670
	Income	.100	.101	.085	.323
	Number of stairs. Family	2,636	.346	.648	.000

a. Dependent Variable: Rice demand

Source: Output SPSS Statistics version 25 for windows

Table 13 shows that the value of sig. at constant, price, taste, and income variables > 0.05 , meaning that it has no significant effect partially on the variable

rice demand (Y), while the value of sig. on the variable number of family dependents < 0.05 , it means that it has a significant partial effect on the rice demand (Y). Such conditions can be explained as follows:

The price variable (X_1) has no significant effect on rice demand (Y), this is because rice is a staple food (essential) which, if it increases or decreases in price, will not have a significant effect on consumption levels (28). In addition, the price of rice in Cirebon tends to be stable, ranging from Rp. 10,000 to Rp. 11,000. This reason is to the results of research by Sartini (2021) and Asih et. al (2021), which explain that rice is the main basic need, and the demand for rice is relatively insensitive to changes in rice prices in the market (13,12). Therefore, every consumer will try to maintain the amount to be consumed, so that whatever the price of rice prevails in the market, it will not affect the amount of rice demand. The results of the research by Aido et.al (2021) added that the price of rice in the market varies, which is adjusted based on the purchasing power of consumers so that the price of rice does not have a significant effect on the demand for rice itself. This is because consumers will tend to switch to a lower price of rice when the price increases rather than having to reduce consumption (29).

The taste variable (X_2) has no significant effect on rice demand (Y) due to the tendency of consumer behavior to prefer rice stocks available at the purchase location (stores) and the types of rice that have varying price categories so that consumers can adjust their abilities, purchasing power when buying rice without considering a particular type of rice. In addition, consumers do not pay attention to taste because rice has become a staple food (26). These results are in accordance with the research Asa (2018), who concludes that taste has no significant effect on rice demand in Malacca (30).

The income variable (X_3) has no significant effect on rice demand (Y), this is because the income of consumers (respondents) is relatively high, ranging from Rp. 4,000,000 to Rp 20,000,000. His basic needs are to be able to buy rice of good quality and sufficient quantity for his family. Therefore, if there is an increase in income, it is not to increase the amount of rice purchased, but to be used for other purposes, for example, savings, recreation, education, housing, health, and clothing, which generally aim to improve the quality of life for themselves and their families. This condition is because the current position of rice products is still an essential item (28,31,32). The results of this study are also in accordance with Rahmalia's research Ningsih et. al (2018) and Sunaryati (2021) who explained that the low consumption of food in the high-income household group was due to a change in lifestyle in urban areas, that is, households would try to meet their food needs, then after income increased and household food needs. If the household is fulfilled, then the household will try to be able to meet their non-food needs such as education expenses, daily transportation costs, health, beauty care, clothing, and others (33,34).

The variable number of family dependents (X_4) has a significant partial effect on rice demand (Y), this is because the greater the number of family dependents, the greater the need for the main food ingredient, namely rice. The regression coefficient number is 2.363, meaning that if the X_4 variable increases by one unit (person), it will result in an increase in Y of 2.363 units (kg) per month, ceteris paribus. This condition is in accordance with the results of research by Yasin and Priyono (2016) which explains that the more the number of dependents in the family, the higher the needs of the family that must be met including the need for rice (35). The number of family members illustrates the

potential number of consumers who will buy rice. The accumulation of rice demand for each family will shape the market demand for rice, so the larger the population/family, the greater the market demand for rice (12,36). The increase in population means that it causes changes in the age structure so the demand for rice also changes because the consumption of rice between adults and children and adolescents is different (37).

Based on the results of the research and discussion above, it can be obtained that the rice demand function (Y) is real, which includes a variable that has a significant partial effect, only the number of family dependents (X_4), so that the equation becomes a simple linear regression, namely:

$$Y = 2.363 X_4$$

Looking at the equation $Y = 2.363 X_4$ it can be said that the nature of the rice demand (Y) to the number of family dependents (X_4) is elastic because the regression coefficient or the elasticity coefficient is 2.363 and it is greater than 1(28);(31);(38);(39). The nature of the elasticity of demand for rice is different from the nature of demand for other commodities towards prices that are generally inelastic (40,41,42). In addition, the equation $Y = 2,363 X_4$ can be interpreted that every time there is an increase in the number of family dependents by 1 person, the number of rice demand increases by 2,363 kg, so this equation can be used to predict the amount of rice demand (Y) in higher education institutions, Swadaya Gunung Jati University Cirebon (X_4 = number of employees = 656 people and the average number of dependents is 4 person) (43), that is:

$$\begin{aligned} Y &= 2,363 \cdot X_4 \\ &= 2,363 \times (656 \times 4) \\ &= 6,200 \text{ kg/month} \end{aligned}$$

Thus, the prediction of the amount of rice demand (Y) can be determined, which is 6,200 kg/month and this amount can be the basis for the realization of the food security program at higher education institutions, Swadaya Gunung Jati University, Cirebon. Furthermore, the results of this research will be submitted to the rectorate for a technical and financial review, especially in the aspects of program implementers, external partners, and financing. The existence of a food security program in higher education institutions means that they have carried out the mandate of Law Number 18 of 2012 concerning Food, namely the guarantee of food availability for employees and lecturers in a proper, safe, quality, balanced and sustainable manner (6). Opportunities to realize this food security program are very open because of the availability of local food resources, human resources, technology, and managerial resources.

CONCLUSION

Based on the results of the research and discussion above, it can be concluded that the variables of price, taste, income, and the number of family dependents simultaneously affect the rice demand in higher education institutions at the Swadaya Gunung Jati University, Cirebon, while partially only the variable number of family dependents has an effect. Therefore, the prediction of the amount of rice demand is based on this variable so that it can be determined at 6,200 kg/month. The results of this prediction are recommended to be followed up by the Rectorate so that the food security program in higher education institutions can be realized and become a model for other higher education institutions throughout Indonesia.

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