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DETERMINANTS OF VEGETABLE CONSUMPTION IN URBAN HOUSEHOLDS IN LAMPUNG PROVINCE

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ABSTRACT

Vegetables have various benefits for the human body, but most people's consumption is still lacking. The purposes of this research were to analyze (1) the vegetable consumption adequacy level and (2) the determinants of the adequacy level of vegetable consumption of urban households in Lampung Province. This study used a descriptive method with secondary data from the 2019 National Socio-Economic Survey (Susenas), from the Central Statistics Agency (BPS) of Lampung Province. A total of 1,500 households were used as samples. The data analysis method used was descriptive and a statistical verification analysis. The results showed that urban households consume an average of 559.37 grams/day, or 152.53 grams/capita/day, of vegetables. The level of household vegetable consumption was still low, with an average of 61.01 percent of the World Health Organization (WHO) recommendation. Household income, number of household members, age of the head of household, the education level of the household's head, and the education level of the housewife positively influenced the adequacy level of household vegetable consumption. The number of household members was the variable that had the greatest influence on the household vegetable consumption level. Income and family size are determinants of adequate vegetable consumption. Therefore, to increase vegetable consumption, the government should educate the community with a focus on allocating income for healthier food. Educational activities can be integrated with ongoing government programs.

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INTRODUCTION

The dietary Diverse pattern (DDP) is a manifestation of the "Beragam Bergizi dan Seimbang (B2S)" food pattern, or a diverse or diversified food pattern. A diversified food pattern will have an impact on the quality of health and food security

of the community. The quality of nutrient intake is getting better the more diverse the food consumed. According to Umanailo (2019), the diversification of food consumption is influenced by social, cultural, economic, and knowledge factors.

The DDP score in Indonesia has increased every year, but the DDP score is still not perfect, which means that the diversity of food consumption still needs to be improved (Table 1). In the food consumption pattern of the Indonesian people, there are four food groups whose consumption is below the DDP standard, one of which is the vegetable and fruit food group. According to Keding et al. (2012), vegetable consumption is correlated with food consumption diversification. In addition, vegetable consumption influences household food security status (Sithole et al., 2023). Therefore, increasing vegetable consumption will improve food diversity and security.

Data on vegetable consumption at both the national and regional levels are available on an ongoing basis because BPS conducts regular surveys in Susenas. However, research to determine the determinants of vegetable consumption is still limited, especially for urban communities. To increase vegetable consumption, it is necessary to conduct research to determine the determinants of vegetable consumption in urban communities.

Table 1. Development of DDP Scores of the Indonesian Population in 2015 - 2019 (Urban and Rural)

No	Food Category	2015	2016	2017	2018	2019	Ideal
1	Grains	25.00	25.00	25.00	25.00	25.00	25.00
2	Tubers	1.10	1.20	1.60	1.20	1.20	2.50
3	Animal Food	18.70	19.70	20.80	21.60	22.90	24.00
4	Oils and Fats	5.00	5.00	5.00	5.00	5.00	5.00
5	Oily fruits	1.00	1.00	0.80	0.50	0.50	1.00
6	Nuts	5.30	5.60	5.80	5.60	5.60	10.00
7	Sugar	2.40	2.50	2.40	1.80	1.80	2.50
8	Vegetables and Fruits	23.00	22.40	24.90	26.20	26.00	30.00
9	Others	0.00	0.00	0.00	0.00	0.00	0.00
	DDP Score	81.50	82.30	86.30	87.00	87.90	100.00

Source: Badan Pangan Nasional (2022)

According to Umanailo (2018), the diversification of food consumption is influenced by social, cultural, economic, and knowledge factors. In addition to these, food availability is another factor that influences the diversity of food consumption. Food availability affects the diversity of food consumption. Farmers produce a variety of foods according to natural conditions and various ecological factors such as soil, climate, season, and biological food resources in the environment. This will influence differences in food availability (Hardinsyah, 2007; Prasetyaningtyas & Nindya, 2017). Vegetable production in urban areas is very constrained, so availability will also be constrained.

Apart from being related to food availability, food consumption is also influenced by various factors. Research Oktavia et al. (2019) found that adolescent vegetable consumption is influenced by gender, monthly money, parents' education level, knowledge about fruits and vegetables, preferences, peer support, self-

confidence, as well as the availability of fruits and vegetables, mass media exposure and body image perceptions. Based on the background that has been described, the purpose of this study is to analyze: (1) the adequacy level of vegetable consumption and (2) the determinants of the adequacy level of vegetable consumption of urban households in Lampung Province.

RESEARCH METHOD

This research was a descriptive study with a secondary data analysis approach. The data used were secondary in the form of cross-sectional data. The data used was raw data from the National Socio-Economic Survey results in 2019 by the Lampung Province Central Statistics Agency (BPS), consisting of 9,653 household samples. Based on this data, categorization was carried out based on the type of area, namely rural and urban. This study only uses a sample of households in urban areas, namely 2,394 household samples.

Based on the 2,394 urban household samples, an outlier test was then conducted, which was a test of the observation conditions of data that have very different characteristics from other data. According to Ghozali (2016), this test is used to find data that includes outlier data. Outlier detection begins by converting data into z-scores. The z-scores <-3 or ≥ 3 indicate outliers (Ghozali, 2016). If outlier data exists, the data will be excluded from this analysis. Based on the results of the outlier test, 894 outlier data points were found, so the data analyzed were 1,500 households.

The data analysis method used in this research was descriptive quantitative and verification analysis. Quantitative descriptive analysis was used to describe the condition of the adequacy level of urban household vegetable consumption in Lampung Province. Verification analysis was used to identify the determinants of the adequacy level of vegetable consumption with multiple linear regression analysis. Independent variables used include household income (IDR/month), number of household members (people), age of household head (years), education level of household head, education level of housewife (years), and gender of household head. Household income was the amount of money received by the household, which is approximated from the calculation of total expenditure per month (IDR/month). Gender of the household head was used as a dummy variable (1= if female, 0 = if male). The dependent variable used was the level of adequacy of vegetable consumption (VCAL) of the household (%). In detail, the results of the research data analysis were described as follows:

Analysis of The Household Vegetable Consumption Adequacy Level

Household food consumption can be seen from the quantity and quality; in this study, vegetable consumption was seen both in quantity and quality. The quantity of consumption is calculated by summing up the weight of all types of vegetables consumed by households, expressed in grams/capita/day. The quality was assessed by the adequacy level of vegetable consumption against the WHO (World Health Organization) recommended consumption standard of 250 grams/capita/day (Peraturan Menteri Kesehatan Republik Indonesia Nomor 41 Tahun 2014 Tentang Pedoman Gizi Seimbang, 2014) or the equivalent of 2 servings

or two glasses of vegetables after cooking and draining (Hermina & Prihatini, 2016). The VCAL of the household was calculated using the following formula:

The VCAL of the household was calculated using the following formula:

$$VCAL = \frac{\sum_{i=1}^{n} Qi}{JART \times 250 gram} \times 100\%$$

Note: VCAL = Vegetable Consumption Adequacy Level (%); Q = Quantity of vegetable consumption (gram/day); n = Types of vegetables to 1, 2, 3, … n ; JART = Number of household members (person)

Furthermore, VCAL is classified into four categories, analogous to the determination of consumption quality criteria according to the Nutritional Adequacy Variety Value or NRKG (Roedjito, 1989), namely: (1) low (VCAL < 60%), medium (60% ≤ VCAL ≤ 69%), sufficient (70% ≤ VCAL ≤ 79%), and high (VCAL ≥ 80%).

Analysis of Determinants of Adequacy Level of Vegetable Consumption of Urban Households in Lampung Province

The model used to analyze the determinants of adequate levels of vegetable consumption is a multiple linear regression model as follows:

$$\text{Ln VCAL} = \alpha 1 + \beta 1 \ln\_X1 + \beta 2 \ln\_X2 + \beta 3 \ln\_X3 + \beta 4 \ln\_X4 + \beta 5 \ln\_X5 + \alpha 2 D1 + \varepsilon$$

Note: VCAL = Vegetable Consumption Adequacy Level (%); X1 = Income (IDR/month); X2 = The number of household members (people) ; X3 = Age of head household (years); X4 = Education level of household head (years); X5 = Education level of housewife (years); D1 = Gender of household head dummy (1= Women; 0 = Man); ε = Standard Error

Considering that the multiple linear regression model used the Ordinary Least Squares method, a classical assumption test was carried out, including the normality test, multicollinearity test and heteroscedasticity test. The normality test in this study used the Jarque-Bera method. Multicollinearity test results were determined based on the VIF (Variance Inflation Factor) value and heteroscedasticity test using the Glejser test. After obtaining the best model, statistical criteria testing was carried out, consisting of adjusted R2, F-statistic test, and t-statistic test.

RESULT AND DISCUSSION

Characteristics of Urban Households in Lampung Province

The sample of households in urban areas in this study was 1,500 households. Based on the results of NSES 2019, the majority of household heads in Lampung Province were male (87.13%). This was in accordance with the general condition of households in various regions. The female heads of household were found only in households where the male head of household had left, either due to death or divorce.

The average age of urban household heads in Lampung Province was 48 years. In terms of age, there were two dominant age groups of household heads in urban communities in Lampung Province: 31 - 45 years old (38.67%) and 46 - 60 years old (37.13%). In other words, most of the household heads in urban areas in Lampung Province are at the productive adult age, namely the age of 31-60. Productive age is when a person is still actively working or between the ages of 15 and 65 years (Badan Pusat Statistik, 2020).

The norm of a small, happy, and prosperous family, or called "Norma keluarga kecil Bahagia dan Sejahtera (NKKBS)", seemed to have been achieved in the urban community of Lampung Province. It can be seen that the majority of households in urban Lampung Province have a household size of 3 - 4 people (58.33%), which generally consists of a husband, wife, and two children.

According to BPS (2020), the highest level of education completed could be an indicator of the quality of human resources (HR). A resident was said to have finished school if they had completed a learning process, as evidenced by passing the final exam of the final class or level of formal and informal education, both in public and private schools, by obtaining a diploma.

In Figure 1, it can be seen that the majority of household heads and housewives in urban areas of Lampung Province have the highest level of education completed at senior high school or 12 years of age. A person's level of education can reflect the person's intellect and can also improve the quality of their social status in the community. Therefore, the higher the level of education completed, the more advanced the ability, insight and way of thinking of a person will be (Badan Pusat Statistik, 2020). The level of final education can be influenced by various factors, one of which is the location and distance of access to education. With the location and distance of the place of education that is not far away, it can facilitate access to education for the population (Setiawan et al., 2023).

The household income level in this study is divided into four groups. Looking at the income level in Figure 2, most households in urban Lampung Province earn more than IDR 3,500,000 per household per month (46.87%). The average household income in urban Lampung Province was IDR 3,874,167.08 per month, while the per capita income was IDR 1,080,232.97.

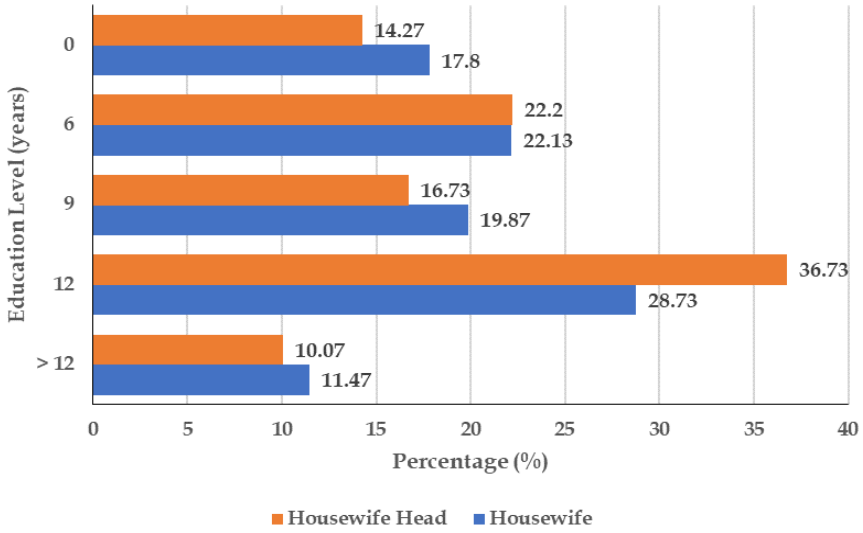

Figure 1.
Percentage of The Education Level of Urban Household Heads and Housewives in Lampung Province in 2019
Source: Secondary Data NSES (2019)

According to BPS (2019) standards, the poverty line (PL) for households and the PL per capita in Lampung Province in 2019 were IDR 1,966,052 and IDR 463,654, respectively. Similarly, when compared to the 2024 PL, which amounts to IDR 2,704,000 per household per month and IDR 586,551 per capita per month (Badan Pusat Statistik, 2024), based on this statement, the condition of income per household and per capita shows that the majority is above the poverty line. This indicates that economic conditions in Lampung Province are good. The higher income can affect family welfare (Haqiqi & Subroto, 2021).

Vegetables are food commodities that are good for health. From the 2019 Susenas data, it is known that there are various types of vegetables and fruits consumed by people in urban Lampung Province. Based on the results of the study, the number of types of vegetables consumed by households in urban Lampung Province in 2019 for one week was 10 types. During the week, there are households that consume 20 types of vegetables, and there are also households that only consume 1 type of vegetable per week.

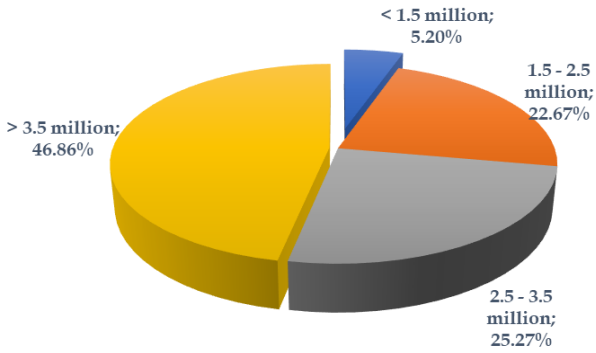

Figure 2.
The Distribution of Households (%) by Income Group Categories.
Source: Secondary Data NSES (2019)

In terms of vegetables in this study, when considered from community consumption, it can be sorted into two types, namely vegetables purchased and consumed in packages and vegetables purchased and or consumed individually. Vegetables purchased and consumed in the form of packages are of four types, including "sayur asem", soup/cap cay/kimlo, gado-gado and "lodeh". In contrast, vegetables purchased/consumed singly include a variety of vegetables. Single vegetables are divided into two groups, namely single vegetables that do not have seasoning ingredients and vegetables that include seasoning ingredients (Table 2).

The single most consumed vegetable in urban households in Lampung Province was water spinach (42.62 grams/day), with maximum and minimum values of 285.71 grams/day and 0 grams/day. The average per capita consumption of water spinach in urban Lampung Province was 11.59 grams/cap/day (Table 3). This average is greater than the average water spinach consumption of the population in Indonesia, which is 10.90 grams/cap/day (Badan Pusat Statistik, 2023). This is because water spinach is the most produced green vegetable in Lampung Province (Kementerian Pertanian, 2024).

Water spinach is one of the sources of green vegetable fiber that is often consumed. According to Mudita et al. (2022), water spinach contains essential vitamins, minerals, antioxidants, fiber, and folic acid that can help improve overall health and potentially reduce the risk of chronic disease, contribute to better skin health, improve digestion, and ensure good mental health. Commonly consumed water spinach vegetable preparations are stir-fried, which is often referred to as stir-fried water spinach. In terms of vegetables in this study, when considered from community consumption, it can be sorted into two types, namely vegetables purchased and consumed in packages and vegetables purchased and or consumed individually. Vegetables purchased and consumed in the form of packages are of four types, including "sayur asem", soup/cap cay/kimlo, gado-gado and "lodeh". In contrast, vegetables purchased/consumed singly include a variety of vegetables. Single vegetables are divided into two groups, namely single vegetables

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Table 2. Category groups and vegetable types

No.	Vegetable Types	Description
1.	Packaged vegetables (4 types)	Vegetable material for "soup/capcay/ kimlo, sayur asem, gado-gado and lodeh".
2.	Single Vegetable	
	a. Non-seasoning vegetables (18 types)	Spinach, water spinach, cabbage, chicory (petsai), mustard greens, beans, long beans, tomatoes, cherry tomatoes, carrots, cucumbers, cassava leaves, eggplant, bean sprouts, pumpkin, chayote/parang pumpkin, young jackfruit, baby papaya, jengkol, baby corn.
	b. Vegetables are included in seasonings (5 types)	Shallots, garlic, red chilli, green chilli, and cayenne pepper.

Source: Secondary Data NSES (2019)

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Table 3. Average Vegetable Consumption in Urban Lampung Province in 2019 by Type of Vegetable

No.	Vegetable Commodities	Consumption	
		Grams/HH/Day	Grams/Cap/Day
	Non-Seasoning Vegetables		
1	Spinach	33.05	8.92
2	Water Spinach	42.62	11.59
3	Cabbage	7.26	1.86
4	Chicory (Petsai)	9.22	2.49
5	Mustard greens	11.00	3.13
6	Beans	8.34	2.23
7	Long beans	28.74	7.91
8	Tomatoes, cherry tomatoes	26.33	7.18
9	Carrots	10.21	2.68
10	Cucumbers	23.68	6.06
11	Cassava leaves	26.33	7.08
12	Eggplant	41.78	11.13
13	Bean sprouts	11.66	3.17
14	Pumpkin,	13.78	3.95
15	Young Jackfruit	7.60	2.00
16	Young papaya	21.82	5.54
17	Jengkol	5.70	1.43
18	Young corn	15.87	4.24
	Vegetables Are Included In Seasonings		
1	Shallots	30.73	8.67
2	Garlic	25.18	7.15
3	Red chili	30.87	8.54
4	Green chili	4.72	1.31
5	Cayenne pepper.	24.12	6.77
	Packed Vegetable		
1	Soup Vegetable/ cap cay/ kimlo)	28.71	7.89
2	Sayur Asem	18.77	5.08
3	Gado-gado	26.67	7.11
4	Lodeh	24.60	7.43
Total Consumption		559.37	152.53

Description: HH = Household
Source: Secondary Data NSES (2019)

Another vegetable commodity frequently consumed by urban households in Lampung Province is eggplant at 41.78 grams/day or 11.13 grams/cap/day (Table 3). The average consumption is 3.07 grams/cap/day, smaller than the average eggplant consumption of the population in Indonesia, which is 8.08 grams/cap/day (Kementerian Pertanian Republik Indonesia, 2022). This is also followed by the production of this seasonal vegetable in Lampung Province, which is around 18,312.2 tons/year (Badan Pusat Statistik, 2023). Many people consume eggplant because these vegetables have a slightly sweet taste and contain nutrients that are good for the body. One of the nutritional contents is anthocyanins, which are useful as antioxidants that boost the immune system (Rakhmat et al., 2021).

Table 3 also shows that vegetables that include seasonings that are widely consumed are shallots and red chillies. This was also found in research (Putri et al., 2019), which states that shallots and red chillies are among the most often consumed seasoning vegetables by households every day. Shallots and red chillies are types of vegetables that are used as spices in the preparation of various dishes.

The most frequently consumed package-type vegetable by urban households in Lampung Province is soup (an average of 28.71 grams/day or 7.89 grams/cap/day). The maximum value is 214.29 grams/day, and the minimum value is 0 grams/day, which means that there are households that do not consume this vegetable, and there are households that consume a lot of this vegetable.

Table 3 represents the consumption of vegetables in three groups: single vegetables, seasoned vegetables, and vegetable packages. Table 3 revealed that the consumption of vegetables in the form of packages contributed the most energy to the per capita energy consumption of vegetables relative to the other two groups (single vegetables and seasoned vegetables). The energy contribution of packaged vegetables ranged from 9.97 percent to 25.87 percent.

The household vegetable consumption standard used in this study is the WHO standard. Because the WHO standard is stated for per capita, the standard for households in this study is the standard multiplied by the number of household members. Vegetable consumption standards for households in the study ranged from 250 to 2,000 grams/day. Based on the results, the average total vegetable consumption per household was 559.37 grams/day or 204.17 kg/year (Table 3). It can also be seen that households in urban Lampung Province consume vegetables ranging from 100.00 - 1,507.14 grams/day. This indicates that households have consumed as few as 100 grams/day and as many as 1,507.14 grams/day.

The average consumption of vegetables in urban areas is still lower when compared to the consumption of vegetables in Lampung Province. Urban residents in Lampung Province consume vegetables ranging from 50.00 - 494.29 grams/cap/day or an average per capita vegetable consumption of 152.53 grams/cap/day (Table 3), while the average vegetable consumption of Lampung Province residents is 170.3 grams/cap/day (Kementerian Pertanian Republik Indonesia, 2022).

Based on Figure 3, the VCAL of urban households in Lampung Province is categorized as low and has not met the HO standards. The average VCAL of urban households in Lampung Province is 61.01 percent with VCAL ranging from 20.00 - 197.71 percent. Therefore, it needs to be improved for the community to consume vegetables. Consumption of vegetables following recommendations can be beneficial

to a quality of life and can prevent some diseases, especially heart disease, cancer, diabetes, anemia, rheumatoid arthritis, and so on (Miller et al., 2016; Noopur et al., 2023).

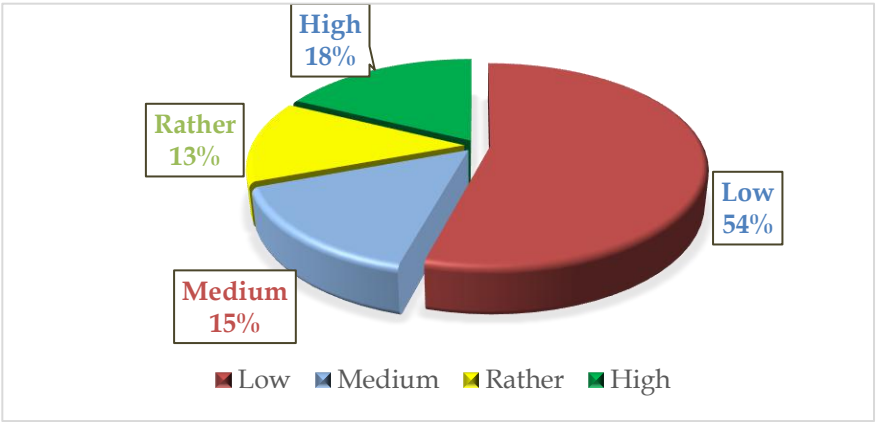

Figure 3.
The distribution of households (%) by VCAL category
(Source: Secondary Data NSES, 2019)

Determinants of Adequacy Level of Urban Household Vegetable Consumption in Lampung Province

The adequacy level of vegetable consumption in this study is thought to be influenced by household income, number of household members, age of household head, education level of household head, education level of housewife, and gender/sex of household head. The results of the analysis of the determinants of the adequacy level of vegetable consumption are described in detail as follows.

In this study, classical assumption tests were carried out, namely normality, multicollinearity, and heteroscedasticity. The results of the normality test in Figure 4 show that this model is normally distributed (Jarque-Bera value 5.289421 with Probability> 0.005). According to Nachrowi & Usman (2006), if the probability value > 0.005, then the model is normally distributed.

The multicollinearity test results also produced VIF values ranging from 1.084 to 1.760 (Table 4). The VIF values obtained for all these variables are smaller than 10. This indicates that there is no multicollinearity in this model.

Table 4. Multicollinearity Test Results

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.015197	262.5046	NA
Ln_X1	0.000291	8.830524	1.281717
Ln_X2	0.000504	15.47794	1.210756
Ln_X3	0.000880	223.9442	1.148474
Ln_X4	0.000139	10.94776	1.755775
Ln_X5	0.000121	9.005486	1.760862
D_JS	0.000557	1.245271	1.084216

Description: X1= Income (IDR/month); X2 =The number of household members (people); X3: Age of head household (years); X4 = Education level of household head (years); X5 =Education level of housewife (years); D1= Gender of household head dummy (1= Women; 0 = Man).

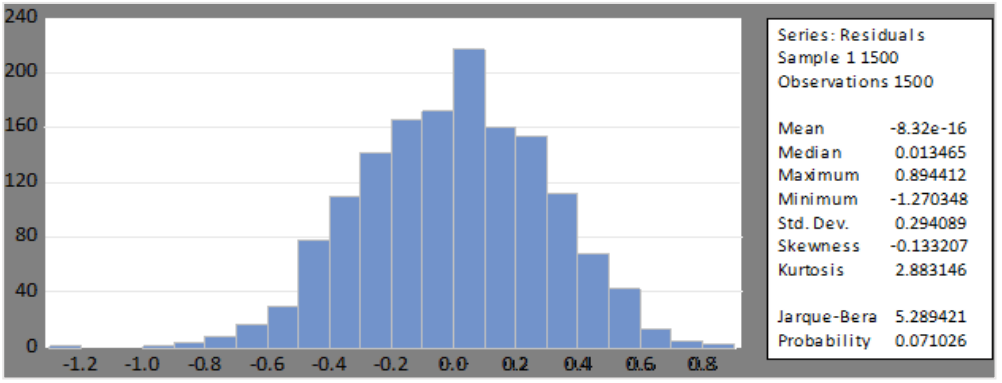

Figure 4.
Results of the Normality Test
Source: Secondary Data NSES (2019)

The results of the heteroscedasticity test using the Glejser method show a Prob. Chi-square value of 0.2470 (Table 5). This value is greater than 0.05, which means that in this model, there is no problem in the heteroscedasticity test.

Table 5. Heteroscedasticity Test Results

F-Statistic	1.390764	Prob. F(6,1493)	0.2147
Obs*R-squared	8.337113	Prob. Chi-Square (6)	0.2144
Scaled explained SS	7.880937	Prob. Chi-Square (6)	0.2470

Source: Secondary Data NSES (2019)

The results of the F test in this study show that the F-count value obtained is 56.22028 with a Prob. F-statistic 0.00000 (Table 6). It can be concluded that together household income, number of household members, age of the head of household, education of the head of household, education of the housewife, and gender of the head of household have a significant effect on the adequacy level of vegetable consumption with a confidence level of 99 percent.

The results of the analysis of the determinants of the adequacy of vegetable consumption show that the adjusted R^2 obtained is 0.1843 (Table 6). This means that 18.43 percent of the adequacy level of vegetable consumption can be explained by household income, number of household members, age of household head, education of household head, education of housewife, and gender of the household head. Other variables that were not analyzed contributed 81.57 percent to the adequate level of vegetable consumption.

Table 6. Results of regression analysis of determinants of the adequacy level of vegetable consumption

Variabel	*Coefficient*		*Std. Error*	*Prob.*
C	4.182009	***	33.92438	0.0000
Ln_X1	0.116281	***	6.821827	0.0000
Ln_X2	-0.381975	***	-17.01460	0.0000
Ln_X3	0.036220	ns	1.221144	0.2222
Ln_X4	0.022100	*	1.875513	0.0609
Ln_X5	0.024188	**	2.200506	0.0279
D1	-0.038742	ns	-1.640959	0.1010
R-squared	0.184297			
Adjusted R-squared	0.181019			
S.E. of Regresion	0.294680			
F-statistic	56.22028			
Prob(F-statistic)	0.000000			

Description: X1= Income (IDR/month); X2 =The number of household members (people); X3: Age of head household (years); X4 = Education level of household head (years); X5 =Education level of housewife (years); D1= Gender of household head dummy (1= Women; 0 = Man); *** = significant $\alpha = 0.01$; ** = significant $\alpha = 0.05$; * = significant $\alpha < 0.10$; ns = not significant $\alpha \geq 0.10$

The small value of the R-square indicates that many other variables can be considered in the model. However, in this research, it was not easy to do because we faced limited data availability in the Susenas data. Variables that could be considered to be accommodated in the model include food prices, nutritional knowledge of vegetables, and vegetable consumption preferences. However, in this analysis, the price of vegetables variable has not been calculated yet. In this research, the education level of the head of household and the housewife is supposed to be a proxy for preferences and nutritional knowledge.

Partial t-test results showed that household income, number of household members, and the education level of the household head and the education level of the housewife had a significant effect on the adequacy level of vegetable consumption. In contrast, the age of the household head and gender of the household head did not have a significant effect on the adequacy level of vegetable consumption (Table 6).

Household income has a significant effect on the adequacy of vegetable consumption at the 99 percent confidence level. The regression coefficient of 0.116 indicates that if household income per month increases by 10 percent, the level of adequacy of vegetable consumption will increase by 1.16 percent. So if the income of urban households in Lampung Province increases by IDR 387,416.71, the VCAL will increase by 0.7 percent to 61.71 percent. This is in line with the research of Nasirzadeh et al. (2020) and Zebua et al. (2019), which states that there is a significant relationship between household income and vegetable consumption intake. Income is a factor that income is a factor that determines the quantity and quality of food consumed. The higher the income, the greater the opportunity to choose good food (Hongu et al., 2022). This is also in line with the research of Murendo et al. (2023), which states that households with higher incomes have better food diversity and a

higher frequency of consumption of fruits and vegetables. Income levels will reflect the ability of consumers to decide on food purchases (Mardiana et al., 2018; Zainuddin et al., 2022).

The number of household members has a significant effect on the adequate level of vegetable consumption with a 99 percent confidence level. The regression coefficient obtained is -0.382, which means that if the number of household members increases by 10 percent, the level of adequacy of vegetable consumption will decrease by 3.82 percent. The results of this study are in line with Choudhury et al. (2020), Hall et al. (2022), and Lomira et al. (2021), which state that the number of household members has a negative effect on the consumption of vegetables and fruits. The number of household members will affect the distribution of food in the household, so the greater the number of household members, the more the food distribution for each individual will decrease. This means the more the number of household members, the lower the level of adequacy of vegetable consumption.

The household head's education level had a significant effect on the level of vegetable consumption at the 90 percent confidence level. The regression coefficient of the household head's education level of the head of household is 0.0221, which means that if the household head's education increases by 10 percent, the level of adequacy of vegetable consumption will increase by 0.22 percent. The average education of urban household heads in Lampung Province is 12 years (high school graduate). This is in line with the research of Bcheraoui et al. (2015), which states that the level of education has a positive and significant effect on the adequacy of consumption of vegetables and fruits. A person's level of education can help in the preparation of a good and healthy food pattern. In addition, education can influence a person in choosing and utilizing the food they consume (Saragih et al., 2023).

The same result was also found for the variable of the education level of the housewives. The education level of the housewife has a significant effect on the adequacy of vegetable consumption at the 95 percent confidence level. The positive regression coefficient value of 0.024188 indicates that if the housewife's education increases by 10 percent, the adequacy level of vegetable consumption in the household will increase by 0.24 percent. The average education level of the housewife is the same as that of the head of the household, who is a high school graduate. This is in line with the research of Ball et al. (2006), which states that the level of education has a positive effect on vegetable consumption. Mothers have a role in decision-making related to purchasing household needs and determining the daily home food menu. Likewise, the results of research by Putri et al. (2019) showed that the education of housewives influenced the amount of household vegetable consumption in Gisting Atas Village, Tanggamus Regency. According to Hamid et al. (2013) and Sayekti et al. (2020, 2022), the higher the level of education, the higher the knowledge and insight of housewives about nutrition, which affects the cooking of daily food.

This research shows that even with the same education level (high school), the household head and housewife have different effects on vegetable consumption. The education of housewives has a significant effect on vegetable consumption, which is understandable as housewives are the decision-makers in food consumption, such as vegetables.

The age of the household head did not significantly affect the adequacy of vegetable consumption. This was also found in the research of Kabwama et al. (2019), which states that age does not affect the consumption of vegetables and fruits in Uganda. The results of this study were different from the research of Phulkerd et al. (2020), which stated that age has a positive effect on the level of adequacy of consumption of vegetables and fruits.

The results of this study also show that gender does not affect the level of adequacy of vegetable consumption. This is in contrast to research by Küçük et al. (2023), Sithole et al. (2023), and Xaba et al. (2021), which states that gender affects the consumption of vegetables and fruits. The discrepancy in the results of this research is estimated to be that the number of samples of male household heads is more than that of women, so that there is no visible difference. Despite this, the insignificant effect of gender on vegetable consumption may be due to differences in gender roles in decision-making among various levels of education or the level of household income. It can be explained by classifying the two variables.

The greatest influence among the independent variables is the number of household members, as indicated by the large value of the regression coefficient (Table 6). Household income is the variable that has the second-largest regression coefficient, but when viewed further, the income category does not show a consistent relationship with VCAL (Figure 5).

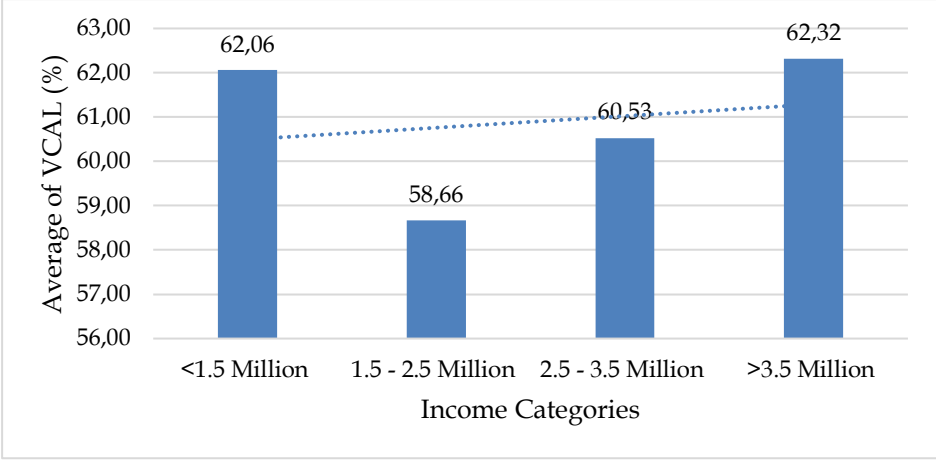

Figure 5.
Average of VCAL by Income Categories
Source: Secondary Data NSES (2019)

This condition is different from the level of education variable, both the education level of the housewife and the head of the household which shows a consistent relationship with VCAL, the higher the level of education, then the higher the VCAL (Table 7).

This indicates that vegetable consumption is significantly related to education. Education will determine knowledge, in this case, knowledge about the adequacy of food consumption, more specifically, knowledge about vegetable consumption. Knowledge about standards of vegetable consumption is not widely known by the community, so the amount of vegetable supplies at the household level is only based on behavior, in the form of as long as there are components of vegetables in the meals.

In light of the finding that vegetable consumption is mainly determined by knowledge about vegetable consumption, it is necessary to improve the public's knowledge. In this case, the government can integrate this aspect of knowledge about vegetables into various existing programs, like the "Makanan Bergizi Gratis (MBG)" program that is currently in progress.

Table 7. Average of VCAL by Education Categories

Education categories	Household's Head	Housewife
Not Graduated	54.88	61.42
Primary school	58.69	56.94
Junior High School	60.59	60.56
Senior high school	62.33	61.85
>Senior high school	70.84	66.18

Source: Secondary Data NSES (2019)

CONCLUSION

The findings of this study suggest that daily vegetable consumption in urban households in Lampung Province averaged 559.57 grams/day or 152.53 grams/cap/day, this is still not in accordance with WHO recommendations (61.01%). Because of this, it is necessary to promote the importance of increasing vegetable consumption.

Household income, the number of household members, the education level of the head of household, and the education level of the housewife had an effect on the adequacy of household vegetable consumption, with the number of household members having the highest. In connection with this, it is necessary to increase public knowledge about vegetable consumption standards. Given that income and family size are determinants of vegetable consumption, the substance of education should be adapted to these factors. The material should not only be related to vegetable consumption standards but also focus on allocating income for healthier food. The government can conduct education by integrating it with ongoing government programs.

AUTHOR CONTRIBUTION STATEMENT

Author [1]: research desain and conseptualisation, also write the initial manuscript draft; Author [2]: research supervision, analytical guidance; Author [3]: addressed reviewer's comments; and Author [4]: edited the manuscript. All authors reviewed and approved the final version of the article.

DECLARATION OF COMPETING INTEREST

We declare that the authors of this article have no affiliation with any institution or agency involved in improving food consumption patterns, whether

through funding or personal or professional relationships. Therefore, the findings of this study are purely academic.

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ETHIC STATEMENT

This research was exempt from the need for ethical review and approval because the data used were secondary data sourced from the Central Statistics Agency. Therefore, the Central Statistics Agency is responsible for obtaining such approval.

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