AGRISOCIONOMICS
Jurnal Sosial Ekonomi dan Kebijakan Pertanian

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 8 (3): 827-841, November 2024

ANALYSIS OF FOOD CONSUMPTION PATTERNS AND INFLUENCING FACTORS: A CASE STUDY OF CASSAVA FARMERS' HOUSEHOLDS IN WONOGIRI REGENCY

Fauzan Hadyan Aryaputra, Fanny Widadie*, and Minar Ferichani
Agribusiness, Faculty of Agriculture, Universitas Sebelas Maret, Surakarta, Central Java, Indonesia

*Correspondence Email: fannywidadie@staff.uns.ac.id

Submitted 12 January 2024; Approved 05 July 2024

ABSTRACT

Food consumption represents a pivotal dimension in enhancing food resilience. This research aims to analyze patterns of food consumption and factors influencing these consupposition patterns. Unlike previous studies that focused only on the level of quanity consumption that examine the level of energy and protein consumption, this study also examined quality consumption by analysing the diversity of food consumption. Furthermore, this study is the first to explore consumption patterns in cassava farmers' households. The research was deliberately conducted in the Pracimantori and Jumantono districts, recognized as the largest cassava-producing regions within the Wonogiri Regency. The dataset comprised 70 cassava farming households, selected through accidental sampling techniques. Household food consumption was quantified using the 2x24-hour food recall method. Analytical methods employed encompassed energy consumption rates (ECR), protein consumption rates (PCR), expected dietary patterns (EDP), and multiple linear regression. The findings revealed that the average household energy and protein consumption were 1,660.13 kcal/capita/day and 55.48 grams/capita/day, respectively. The ECR and PCR values were 78.67% and 89.37%, categorising them as inadequate and moderate, respectively. The EDP score for the households was 74.7, signifying a suboptimal category. The grain and legume food groups exceeded the recommended EDP values, while other food groups remained below the recommended thresholds. An analysis of influencing factors on household food consumption patterns indicated that household size and the age of the household head significantly impacted household energy consumption. In contrast, household income, maternal education, and land area exhibited no significant influence.

Keywords: *cassava farmers' household, food consumption pattern, quality consumption, quantity consumption, Wonogiri*

BACKGROUND

Food consumption patterns refer to the composition, quantity, and frequency of food intake by individuals or groups over specific time intervals (Adha & Suseno, 2020). Generally, these patterns are influenced by socio-cultural, demographic, and lifestyle factors. The dietary habits of a population are also significantly related to its food security status (Jayati et al., 2014). The quantity and quality of food consumed can have significant implications for the availability, accessibility, and stability of food supplies (Pinstrup-Andersen, 2009). For example, a shift towards more resource-intensive and environmentally damaging food choices can put pressure on the food production system, potentially leading to shortages and price volatility (Cutter, 2017). Similarly, changes in consumer preferences and dietary habits can alter the demand for certain food products, which in turn can affect the viability and resilience of food supply chains (Iyiade Adetunji, 2021).

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 8 (3): 827-841, November 2024

Based on the average percentage of monthly per capita expenditure data for the years 2020 and 2021, the primary food commodities consumed by the residents of Wonogiri Regency were processed foods, beverages, and grains (BPS of Wonogiri Regency, 2022). The 2021 National Socioeconomic Survey (Susenas) for Wonogiri Regency reported an average energy consumption of 2,034.91 kcal/capita/day and a protein intake of 55.92 grams/capita/day (BPS of Wonogiri Regency, 2021). These figures fall short of the nutritional adequacy standards recommended by Ministerial Regulation No. 28 of 2019, which advocate for a daily energy intake of 2,100 kcal/capita and a protein intake of 57 grams/capita.

According to the Central Bureau of Statistics (BPS) for the year 2021, Wonogiri Regency is among the major cassava producers in Central Java Province. However, despite being a significant contributor to the food commodity sector, issues regarding food diversification persist. In 2019, cassava cultivation and production in Wonogiri Regency accounted for 46,873 hectares, representing 44.61% of the total cassava cultivation area in Central Java Province, and 890,438 tons, equivalent to 29.88% of the total cassava production in the province (BPS of Central Java, 2021). Nevertheless, the productivity level of cassava farming was only 189.97 in 2019, directly impacting the income of cassava farmers in Wonogiri Regency. As highlighted by Hanum (2017), income levels at a given time influence consumption patterns. Rahayu & Sutrisno (2022) further noted that the poverty rate among cassava farmers in Wonogiri Regency was 23%, significantly higher than the general poverty rate of 11.55% in the regency, indicating low-income levels among cassava farmers. Consequently, the low income of cassava farmers in Wonogiri Regency directly affects the food consumption patterns of these households.

Food consumption is an integral component of food resilience, complementing food availability (production) and smooth, equitable distribution (Nugroho et al., 2020). From a consumption perspective, food resilience entails ensuring balanced nutritional adequacy (Aisyah, 2020). Food resilience systems operate not only at macro levels (national and regional) but also at micro levels, focusing on household and individual food access (Setyaningsih, 2020). Household food resilience is gauged by its nutritional adequacy, with nutritional indicators encompassing energy, protein, and dietary diversity.

Therefore, to bolster micro-level food resilience, this study analyzes the food consumption patterns of cassava farming households in Wonogiri Regency. The analysis encompasses both quantitative aspects, such as energy and protein consumption rates, and qualitative aspects, including dietary diversity. Additionally, the research explores factors influencing the quality of food consumption among cassava farming households. Different from previous studies that focus only on quantitative aspects, this study also examines the qualitative aspects in analysing the food consumption patterns (Masthalina et al., 2021; Munawar et al., 2021; Rauf et al., 2023). In addition, based on authors' knowledge no one studies have explored the food consumption patterns in cassava farmers' households. The outcomes of this study are anticipated to enrich the existing literature on food consumption patterns among farming households and provide valuable insights for governmental efforts to enhance nutritional intake and food resilience in these households.

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 8 (3): 827-841, November 2024

RESEARCH METHODS

The research was conducted using purposive sampling in Wonogiri Regency, the largest cassava-producing region in Central Java. Samples were collected from the Pracimantoro and Jatiroto districts, which represent the highest cassava producing areas within the Wonogiri Regency. Due to lack of information on the number of cassava farmers in the districts, this study employed an accidental sampling technique, in which households were selected opportunistically based on encounters. A total of 70 cassava farmers' households were sampled for this study. According to Roscoe (1982) in Sugiyono (2014), sample size which is appropriate for research is between 30 and 500.

Household food consumption patterns were assessed in terms of both quantity and quality. Quantitative food consumption was analyzed using the Energy Consumption Rate (ECR) and Protein Consumption Rate (PCR) approaches. Data on respondents' food consumption were collected using the 2x24-hour food recall method. ECR and PCR calculations were performed using the Nutrisurvey 2007 application, based on the Food Composition List. The ECR and PCR values utilized in this study, as per Ministerial Regulation No. 28 of 2019, were set at 2,100 kcal and 57 grams, respectively.

$$\text{ECR} = \frac{\text{Actual Energy Consumption } (\sum\text{KGIJ Actual})}{EER} \times 100\ \%$$

$$\text{PCR} = \left(\frac{Actual\ Protein\ Consumption\ (\sum\text{Protein})}{PAR}\right) \times 100\%$$

Information:

ECR	=	Energy Consumption Rate (%)
PCR	=	Protein Consumption Rate (%)
∑Kgij	=	Total daily energy consumption (kcal/person/day)
∑Protein	=	Total daily protein consumption (kcal/person/day)
EAR	=	Energy Adequacy Rate (kcal/person/day)
PAR	=	Protein Adequacy Rate (grams/person/day)

According to Wahyuni & Fauzi (2016), the classification of energy and protein consumption levels, as outlined by the Ministry of Health in 1990, is as follows:

1. Excellent Category = ECR/PCR ≥ 100%
2. Moderate Category = ECR/PCR 80-99%
3. Insufficient Category. = ECR/PCR 70-80%
4. Deficit Category = ECR/PCR <70%

The analysis of household food consumption quality employs the Expected Dietary Pattern (EDP) approach. The Expected Dietary Pattern describes the diversity and quality of food consumed, evaluated using scores (Muhammad et al., 2022). According to Ariani (2010), food consumption quality is deemed excellent and perfectly diversified when the EDP score reaches 100. The EDP composition for the year 2020 is presented in Table 1.

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 8 (3): 827-841, November 2024

Table 1. Composition of the National Expected Dietary Pattern for the Year 2020

No	Food Group	National Expected Dietary Pattern					Regional Expected Dietary Pattern	
		WNPG XI, 2018		% RDA	Weight	EDP Score	% RDA	EDP Score
		Gram/day	Energy					
1	Grains	289	1075	50	0.5	25	45	22
2	Tubers	105	129	6	0.5	2.5	12	6
3	Animal Products	157	258	12	2	24	12	24
4	Oils and Fats	21	215	10	0.5	5	10	5
5	Oily Fruits/Seeds	11	64.5	3	0.5	1	2	1
6	Legumes	37	107.5	5	2	10	5	10
7	Sugar	31	107.5	5	0.5	2.5	5	2
8	Vegetables and Fruits	262	129	6	5	30	6	30
9	Others	-	64.5	3	0	0	3	0
	Total	-	2150	-	-	100	100	100

The actual EDP is computed through several stages. 1) Calculate the percentage contribution (%) of the kgij from each food group to the total actual energy and nutrient content. 2) Determine the actual score by multiplying the percentage contribution by the weight of each food group. 3) Compute the actual EDP score for each food group. Factors influencing household food consumption patterns are analyzed using multiple linear regression, formulated as follows:

$$LnY = b0 + b1X1 + b2X2 + b3X3 + b4X4 + b5X5 + e$$

Information:

LnY	:	Household Cassava Farmer Food Consumption Pattern (kcal)
b0	:	Intercept Coefficient (Constant Value)
b1, b2, b3, b4, b5	:	Regression Coefficients
X1	:	Cassava Farmer Household Income Level (Rp)
X2	:	Number of Members in Cassava Farmer Household (Individuals)
X3	:	Education Level of Cassava Farmer’s Wife (Years)
X4	:	Age of Cassava Farmer (Years)
X5	:	Area of Cassava Farming Land (m^2)
e	:	Error Term

The classical assumption tests serve as essential statistical prerequisites that must be satisfied in ordinary least-squares-based multiple linear regression analyses. The linear regression model must adhere to the BLUE (Best, Linear, Unbiased, and Estimator) assumptions. Three classical assumption tests employed in this study include tests for normality, heteroskedasticity, and multicollinearity.

1. Normality test. The normality test is used to determine whether the data distribution is close to a normal distribution. The test used the Kolmogorov-Smirnov test. The data are normally distributed if the value on the significant level is greater than $\alpha = 0.05$.

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 8 (3): 827-841, November 2024

2. Heteroscedasticity test. The heteroskedasticity test is used in regression models to test the inequality of variance. The study uses the Gletser test as a heteroscedasticity tester by looking at the significat value. If the significant value is greater than $\alpha = 0.05$, there is no heteroscedasticity problem.
3. Multicollinearity test. The multicollinearity test is used to determine the presence of correlation between some or all the independent variables in the models. This study uses the Variance Inlactiion Factor (VIF) score. The multicollinearty presence if the VID is greater than or equal to 10. However, if the VIF is less than 10, the multicollinearty is not present in the model.

RESULT AND DISCUSSION

Characteristics of Respondent Households

Table 2 presents data on the characteristics of the respondent households. The majority of household respondents are within the productive age range of 15-64 years. The predominant educational level within the households is elementary school (SD) at 50.48%. To elaborate further, the majority of both husbands and wives in the households have an elementary school education, at 64.28 and 78.57%, respectively. The lower educational attainment among mothers in the households can be attributed to limited educational facilities in the past, geographical conditions characterized by mountains affecting accessibility, and environmental factors. Most households consist of 1-3 members. Household income is derived from the average earnings of each working member within the household on a monthly basis. The average agricultural income for cassava farming households is valued at Rp 2,029,216.00. Income from cassava farming contributes 19.52% to the total household income. This percentage is lower than the income from non-cassava farming, which stands at 28.47%. Non-cassava agricultural income sources, such as corn and rice farming, command relatively higher selling prices. External non-farming income is valued at Rp 2,199,286.00, accounting for 52.01% of the total income for cassava farming households. Non-farming income is derived from secondary employment, government assistance, and remittances from household members engaged in cassava farming. Secondary employment contributes 30.86%, encompassing occupations such as trading, laboring, livestock farming, and village administrative roles. Government cash assistance constitutes the smallest income contributor at 1.52%. This assistance is sourced from programs such as the pre-employment card, assistance for laid-off workers, small business aid affected by the COVID-19 pandemic, and direct village fund transfers. Remittances range from Rp 200,000 to Rp 6,000,000. Farmers utilize these remittances for emergency purposes, while daily expenses are covered by other sources of income, resulting in a significant portion of remittances being saved.

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 8 (3): 827-841, November 2024

Table 2. Socio-economic Characteristics of Respondent Households

Variable	Definition of Variable	Sample
Age (%)	Under 14 years	6.19
	15 – 64 years	80.47
	Over 65 years	13.81
Education (%)	No formal education	3.33
	Elementary School (6 years)	50.48
	Junior High School (9 years)	20.95
	Senior High School (12 years)	24.76
	College (>13 years)	0.95
Household Members (%)	1-3 individuals	67.01
	≥ 4 individuals	32.09
Agricultural Income (Rp/month (%))	Cassava Income	825,219 (19.52)
	Non-cassava Income	1,203,997 (28.47)
	Total Agricultural Income	2,029,216 (47.99)
Non-agricultural Income (Rp/month (%))	Secondary Employment Income	1,305,000 (30.86)
	Government Assistance	64,286 (1.52)
	Remittances from Household Members	858,571(20.30)
	Total Non-agricultural Income	2,199,286 (52.01)

Analysis of the Quantity of Household Food Consumption Patterns among Farmers

In terms of quantity, the analysis utilized the household Energy Consumption Rate (ECR) and Protein Consumption Rate (PCR) based on the food and beverage intake of each individual. The food consumption was calculated over a 2x24-hour period, detailing the types of food and beverages consumed by the individuals. These data were then processed using the Nutrisurvey 2007 application to ascertain the energy and protein content values for each type of food and beverage consumed.

Table 3. Average Energy and Protein Consumption, as well as ECR and PCR, of Cassava Farmer Household Members in Wonogiri Regency

Nutrient	Average Consumption	Recommended EAR and PAR	ECR and PCR (%)
Energy	1,660.13	2,110.19	78.67
Children	1,176.63	1,433.33	82.09
Adults	1,658.10	2,109.42	78.60
Protein	55.48	62.11	89.37
Children	42.25	26.67	158.44
Adults	55.32	62.54	88.47

Table 3 presents the average energy and protein consumption of cassava farmer households, which remain below the recommended Energy Adequacy Rate (EAR) and Protein Adequacy Rate (PAR) values. The average individual energy consumption within cassava farmer households is 1,660.13 kcal, which falls below the recommended EAR of 2,110.19 kcal, yielding an Energy Consumption Rate (ECR) of 78.67%, categorized as insufficient. Based on age classification, the average energy consumption for children is 1,660.13 kcal/capita/day, whereas for adults, it is 1,658.10 kcal/capita/day. The recommended EAR for children and adults is 1,433.33 kcal/capita/day and

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 8 (3): 827-841, November 2024

2,109.42 kcal/capita/day, respectively. The corresponding ECR values for children and adults are 82.09% and 78.60%, classified as moderate and insufficient, respectively.

The average individual protein consumption within these households is 55.48 grams, which is below the recommended Protein Adequacy Rate (PAR) of 62.11 grams, resulting in a Protein Consumption Rate (PCR) of 89.37%, categorized as moderate. Based on age categories, the average protein consumption for children and adults is 42.25 grams and 55.32 grams, respectively. The recommended PAR for children and adults is 26.67 grams and 62.54 grams, respectively. The corresponding PCR values for children and adults are 158.44% and 88.47%, falling into the good and moderate categories.

Table 4. One-Sample t-Test on Actual Energy and Protein Consumption Based on Age Groups of Children and Adults

One Sample t-Test			
	t_0	df (n-1)	t_a
Energy Consumption in Children	-3.979	5	2.446
Energy Consumption in Adults	-14.819	204	1.971
Protein Consumption in Children	4.632	5	2.446
Protein Consumption in Adults	-5.286	204	1.971

The one-sample t-test was employed with the null hypothesis (Ho) stating that the actual Energy Adequacy Rate (EAR) and Protein Adequacy Rate (PAR) are less than the recommended EAR and PAR from the Ministry of Health. The alternative hypothesis (Ha) posits that the actual EAR and PAR are greater than the recommended values. Based on the one-sample t-test, the calculated t-value for children's energy consumption was -3.979, with a critical t-value of 2.446 (t-calculated < t-critical). Similarly, for adults, the calculated t-value was -14.819, with a critical t-value of 1.971 (t-calculated < t-critical). These findings indicate that both children and adults have energy consumption levels below the recommended values. Rendahnya konsumsi energi dibawah standar dikarenakan rendahnya jumlah konsumsi energi yang dikonsumsi oleh rumahtangga petani. Selain itu jenis konsumsi pangan energi masih tergantung pada beras. The calculated t-value for children's protein consumption was 4.632, exceeding the critical t-value of 2.446 (t-calculated > t-critical), indicating that the protein consumption in children surpasses the recommended level. Conversely, for adults, the calculated t-value was -5.286, with a critical t-value of 1.971 (t-calculated < t-critical), indicating that the protein consumption in adults remains below the recommended level. Rendahnya konsumsi protein dikarenakan selain rendahnya jumlah konsumsi protein juga masih tergantungnya konsumsi protein pada pangan olahan kedelai saja yaitu tempe dan tahu.

Table 5 illustrates the distribution of Household Energy Consumption Rate (ECR) and Protein Consumption Rate (PCR) among cassava farmer households. The majority of these households fall into the moderate category, comprising 28 households (40%), while 27 households (38.57%) are classified as insufficient. Regarding the distribution of household protein consumption levels, the majority are categorized as good and moderate, encompassing 22 households, or 31.43%. The prevalence of households categorized as insufficient can be attributed to their inability to meet the actual energy consumption levels as recommended. This is indicative of the respondents' habitual consumption of rice, which serves as a primary energy source. According to Yudaningrum (2011), a deficiency in rice consumption as the primary energy source can lead to a reduced level of energy consumption. Additionally, this trend may be influenced by the limited variety of other energy sources consumed by the respondent.

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 8 (3): 827-841, November 2024

Table 5. Distribution of Energy and Protein Consumption Rate Categories among Cassava Farmer Households in Wonogiri Regency

Categories of Energy and Protein Consumption Rates	Energy		Protein	
	Number of Households	%	Number of Households	%
Good (EAR/PAR ≥ 100%)	6	8.57	22	31.43
Moderate (EAR/PAR 80-90%)	28	40	22	31.43
Insufficient (EAR/PAR 70-80%)	27	38.57	8	11.43
Deficit (EAR/PAR 70-80%)	9	12.86	18	25.71
Total	70	100	70	100

In the distribution of household protein consumption levels, the majority fall within the categories of good and moderate. Specifically, 22 households, representing 31.43% of the total respondent households, were identified. This indicates that the majority of respondent households have protein sufficiency levels close to the recommended values. This trend is influenced by the consumption of plant-based protein sources, namely tofu and tempeh, as nearly all respondent households incorporate tofu and tempeh as staple foods in their daily diets. This found is in line with previous studies that the consumption of protein from plant-based sources like tofu and tempeh in households is increasing and the majority households rely on the foods as significant components of protein sources in them dietary (Anindita et al., 2022; Nurhasan et al., 2022; Wijaya-Erhardt et al., 2011).

Analysis of Household Food Consumption Patterns among Farmer Households

The quality of food consumption patterns can be gauged by the diversity of food sources consumed by households. The diversity of food consumption among farmer households can be discerned from the analysis of Expected Dietary Pattern (EDP) scores of cassava farmer households in Wonogiri Regency. Table 6 reveals that the EDP score for cassava farmer households remains below the recommended EDP value. The actual EDP score is recorded at 74.7, indicating a deviation of 19.4 from the normative EDP value. For the rice-based food group, the EDP score is 25.8, surpassing the recommended EDP score of 25. The majority of cassava farmer households consider rice as their primary staple food. As highlighted by Sayekti et al. (2016), most households prioritize the availability of rice as the main food source, particularly in rural areas. In the tuber-based food group, the EDP score is 1.1, falling below the recommended EDP value of 2.5. Most cassava farmer households commercialize their cassava produce, as indicated by Indiako et al. (2014). Cassava farmers in Desa Negara Ratu tend to commercialize their entire cassava harvest for industrial purposes.

For animal-based food groups, the EDP score is 9.9, still below the recommended EDP score of 24. Dietary habits, characterized by simple consumption patterns, contribute to this lower EDP value. As stated by Marchianti et al. (2017), an individual's dietary consumption is influenced by eating habits, representing human behavior in meeting dietary needs. In the oil and fat-based food group, the EDP score is 0.7, falling short of the recommended EDP value of 5. Most food items consumed by cassava farmer households are free from added oils, with the primary oil source being coconut oil used for frying purposes. In the category of fruit/oily seeds, the score value for EAR is 0.1, which exceeds the recommended EDP value of 1. For households of cassava farmers, the consumption of fruit/oily seeds primarily originates from coconut milk used as a supplementary seasoning. In the legumes category, the score value for EAR stands at 15.1, surpassing the recommended EDP value of 10. The elevated consumption of legumes is attributed to the intake of tofu and tempeh (Anzaini et al., 2022). Tofu and tempeh serve as consistent plant-based protein sources available in the market, hence their frequent incorporation as daily staples.

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 8 (3): 827-841, November 2024

Table 6. Analysis of the Dietary Patterns of Cassava Farmer Household Expectations in Wonogiri Regency July 2022

Food Group	Actual Energy	Normative Energy	% Actual	% EAR	Weight	Actual Score	EAR Score	Max Score	EDP Score	Score Difference
Grains	1108	1075	66.7	52	0.5	33.4	25.8	25	25	0.8
Tubers	48.7	129	2.9	2	0.5	1.5	1.1	2.5	1.1	-1.4
Animal Products	106.8	258	6.4	5	2	12.9	9.9	24	9.9	-14.1
Oils and Fats	30.6	215	1.8	1	0.5	0.9	0.7	5	0.7	-4.3
Oily Fruits/Seeds	5.7	64.5	0.3	0	0.5	0.2	0.1	1	0.1	-0.9
Legumes	162.2	107.5	9.8	8	2	19.5	15.1	10	10	5.1
Sugar	68.83	107.5	4.1	3	0.5	2.1	1.6	2.5	1.6	-0.9
Vegetables and Fruits	112.9	129	7	5	5	34	26.3	30	26.3	-3.7
Others	16.4	64.5	1	1	0	0	0	0	0	0
Total	1,660.13	2,150	100	77		104.4	80.6	100	74.7	-19.4

In the category of sugar-containing foods, the EAR score is 1.6, which is below the recommended EDP value of 2.5. A majority of the respondents do not favor overly sweet tea beverages. Furthermore, households were found to consume plain water as their daily beverage. Within the category of vegetables and fruits, the EAR score is 26.3, falling below the recommended EDP value of 30. The proportion of vegetables used as a main dish in comparison to rice consumed remains significantly low. The dietary preference of the farming households tends towards increasing rice consumption over vegetable intake. In the 'other' food category, the actual energy value is 16.4 kcal. This value is derived from beverage consumption by the farming households. The weightage in the other food category is 0, indicating a perception that this category does not significantly contribute to energy intake.

Based on the analysis of EDP regarding the dietary consumption of cassava farming households in Wonogiri Regency, it is concluded that dietary diversification in these households has not been optimized. This is evident as six out of the nine food categories fall below the recommended EDP values as stipulated by the Ministry of Health Regulation. The significant number of food categories not meeting the recommended values suggests a lack of diversity in the dietary patterns of cassava farming households. The consumption patterns predominantly revolve around grain-based foods and legumes, influenced by the dietary habits prevalent in the research area.

Analysis of Factors Influencing Household Food Consumption

Normality test was carried out using the Kolmogorov-Smirnov test of one sample, assessing the significance level from the Kolmogorov-Smirnov test of one sample table (Table 7). The test yielded an Asymp. Sig. The (2-tailed) value of 0.082 and the significance value is > 0.05 indicating that the data are normally distributed normally.

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 8 (3): 827-841, November 2024

Table 7. Results of Normality Test for Factors Influencing Cassava Farming Household Food Consumption

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		70
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	.17650880
Most Extreme Differences	Absolute	.100
	Positive	.100
	Negative	-.075
Test Statistic		.100
Asymp. Sig. (2-tailed)		.082[c]

Table 8 reveals that all independent variables have a significance value > 0.05, indicating that there are no heteroskedasticity issues.

Table 8. Results of Heteroscedasticity Test for Factors Influencing Cassava Farming Household Food Consumption

Coefficients[a]					
Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
	B	**Std. Error**	**Beta**		
(Constant)	.221	.131		1.686	.097
Household Income	7.403E-9	.000	.169	1.015	.314
Number of Family Members	-.009	.017	-.070	-.529	.599
Housewife Education	-.006	.007	-.118	-.911	.366
Age of Head of Family	-.001	.002	-.063	-.480	.633
Land area	-4.616E-7	.000	-.038	-.235	.815

Table 9. Results of Multicollinearity Test for Factors Influencing the Dietary Consumption Patterns of Cassava Farming Household

Coefficients[a]		
Model	**Collinearity Statistics**	
	Tolerance	**VIF**
(Constant)		
Household Income	.545	1.835
Number of Family Members	.873	1.146
Housewife Education	.896	1.116
Age of Head of Family	.867	1.154
Land area	.585	1.710

The results of the multicollinearity test analysis in Table 9 indicate that independent variables have tolerance coefficients greater than 0.10. This suggests the absence of multicollinearity since the tolerance value exceeds 0.10 and the VIF values are less than 10. The analysis of the R^2 test is used to determine the percentage of variance in the dependent variables explained by changes in the independent variables. As shown in Table 10, the R test value is 0.844, which categorises the result as very strong. The adjusted R^2 value of 71.3% indicates that household income, the number of family

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 8 (3): 827-841, November 2024

members, maternal education, the age of the head of household and the area of the land collectively account for 71.3% of the variance in energy consumption between cassava farming households. The remaining 28.7% are attributed to variables not included in this study.

Tabel 10. R^2 Factor Test Analysis Results for Factors Influencing the Dietary Consumption Patterns of Cassava Farming Household

Model Summary[b]				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.844[a]	.713	.690	.18327

Tabel 11. Results of the t-test Analysis for Factors Influencing the Dietary Consumption Patterns of Cassava Farming Household

Coefficients[a]					
Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
	B	**Std. Error**	**Beta**		
(Constant)	8.030	.209		38.430	.000
Household Income	9.059E-9	.000	.071	.779	.439
Number of Family Members	.297	.028	.775	10.797	.000
Housewife Education	-.013	.010	-.090	-1.277	.206
Age of Head of Family	-.007	.003	-.190	-2.642	.010
Land area	-2.134E-6	.000	-.060	-.681	.498

The t-test is employed to determine the partial influence of independent variables on the dependent variable. Based on the analysis of the t-test results presented in Table 11, it is evident that the variables number of family members and age of the household head significantly influence the energy consumption of farmers. The "number of family members" variable achieved a significance value of 0.000, which is below the 0.05 threshold. This suggests that, in partial terms, an increase in the number of family members positively influences energy consumption. Specifically, as the size of the family expands, the energy consumption among the cassava farming households increases proportionally. When the number of family members increases, the amount of consumption also increases. Zebua (2019) elucidated that the number of household members significantly impacts the likelihood of expenditure, particularly on food consumption.

The educational level of the household head achieved a significance value of 0.206, surpassing the 0.05 threshold. This implies that, in partial terms, the educational level of the household head does not significantly affect energy consumption. A majority of the household heads possess a modest educational background; for instance, 55 of them have only completed primary education. Faradina et al. (2018) similarly observed that a significant portion of household heads in the research area had limited education, with 39 having primary education and 21 attaining high school completion. Compared to other household heads, they tend to conform to local societal norms, aligning with Duesenberry's theory that posits household consumption preferences are interdependent. Thus, household consumption patterns are influenced by the expenditures of their surrounding community.

The age of the household head yielded a significance value of 0.010, which is below 0.05. This indicates that, in partial terms, the age of the household head negatively influences energy consumption. Given that the average age of the cassava farming household head is 60 years, they fall

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 8 (3): 827-841, November 2024

into a non-productive age bracket. This reduced productivity affects their ability to meet the energy consumption needs of the household. This finding is similar to those reported by Yu et al. (2023) that the ageing population can lead to a decrease in energy consumption, with each percentage increase in population ageing potentially resulting in a decrease in energy usage.

The household income variable obtained a significance value of 0.439, which exceeds the 0.05 threshold. This indicates that household income, in partial terms, does not significantly influence the energy consumption of the cassava farming households. The majority of these households refrain from utilizing income derived from dependent family members, remittances, and assistance for food consumption. The respondents predominantly reside in rural environments, characterized by a simple lifestyle synonymous with rural communities. A'dani et al. (2021) highlighted the inclination of rural farming households towards a modest way of life, expressing contentment and gratitude towards their available resources.

The land area variable garnered a significance value of 0.498, below the 0.05 threshold. This reveals that, in partial terms, the land area does not significantly affect the energy consumption of cassava farming households. The limited educational background of many farmers impacts their ability to effectively utilize their agricultural land. Yulida (2012) emphasized that the restricted knowledge, attitudes, and skills of farmers significantly influence their agricultural productivity. In this study, a confidence level of 95% or a significance level (sig) of 0.05 was utilized. The results of the F-test calculations can be observed in Table 12 below. Based on the analysis, the calculated F-value is 31.731 with a corresponding p-value (sig) of 0.000. This p-value is less than the significance level (α) of 0.05. Hence, it can be concluded that the independent variables collectively have a significant influence on the energy consumption of cassava farming households in Wonogiri Regency (Y).

Table 12. Results of the F-Test on Factors Influencing the Consumption Patterns of Cassava Farming Household in Wonogiri Regency

ANOVA[a]					
Model	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Regression	5.329	5	1.066	31.731	.000[b]
Residual	2.150	64	.034		
Total	7.479	69			

CONCLUSION AND SUGGESTION

Nutritious and balanced food consumption is integral to food security. Farming households are particularly susceptible to food insecurity, as evidenced by their consumption patterns often deviating from both quantitative and qualitative nutritional standards. This study analyzed food consumption among cassava farming households in Wonogiri Regency, examining both its quantity and quality aspects. In terms of quantity, the average daily energy and protein consumption for cassava farming households are 1,660.13 kcal and 55.48 grams, respectively. The consumption levels of energy and protein are 78.67% and 89.37%, respectively, falling into the categories of inadequate and moderate. Regarding quality, the cassava's EDP score stands at 74.7, categorized as inadequate. Among the nine food groups consumed, grain-based foods and legumes exceed recommended levels. Conversely, other food groups such as tubers, animal products, oils and fats, oil-rich fruits/seeds, and

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 8 (3): 827-841, November 2024

fruits and vegetables remain below the recommended values. The multiple linear regression analysis reveals that the number of family members and the age of the household head significantly influence household energy consumption.

Based on these findings, it is evident that the dietary consumption patterns of cassava farming households in Wonogiri Regency do not meet either the quantity or quality standards. Energy and protein intake falls significantly below the recommended levels. Additionally, dietary diversity and balance remain insufficient. To enhance food quantity consumption, efforts should focus on increasing energy intake from sources such as tubers. Concurrently, to improve dietary quality and diversity, it is necessary to shift household perceptions and habits toward a more varied diet, not solely reliant on rice. The government is expected to reinvigorate the food consumption diversification programme by providing socialisation to farming households to increase the diversity of energy and protein consumption.

REFERENCES

A'dani, F., Sukayat, Y., Setiawan, I., & Judawinata, M. G. 2021. Pandemi Covid-19: Keterpurukan dan kebangkitan pertanian strategi mempertahankan ketersediaan pangan pokok rumah tangga petani padi pada masa pandemi COVID-19 (Studi Kasus: Desa Pelem, Kecamatan Gabus, Kabupaten Grobogan, Jawa Tengah). Mimbar Agribisnis, 7(1), 309–319.

Adha, A. S. A., & Suseno, S. H. 2020. Pola konsumsi pangan pokok dan kontribusinya terhadap tingkat kecukupan energi masyarakat Desa Sukadamai. Jurnal Pusat Inovasi Masyarakat (PIM), 2(6), 988–995.

Anindita, R., Khoiriyah, N., & Sa'diyah, A. A. 2022. Food Consumption Pattern Far Away From Home as a Source of Household Food Protein in Indonesia. Iop Conference Series Earth and Environmental Science, 1107(1), 012118. https://doi.org/10.1088/1755-1315/1107/1/012118

Anzaini, B. K., Gantini, T., & Srimenganti, N. 2022. Analisis Ketahanan Pangan Berdasarkan Proporsi Pengeluaran Dan Konsumsi Energi (Suatu Kasus Pada Rumah Tangga Petani Buruh Di Desa Gunungmanik Kecamatan Tanjungsari Kabupaten Sumedang). OrchidAgri, 2(2).

Ariani, M. 2010. Analisis konsumsi pangan tingkat masyarakat mendukung pencapaian diversifikasi pangan. Gizi Indonesia, 33(1).

BPS Jawa Tengah. 2021. Provinsi Jawa Tengah Dalam Angka 2021.

BPS Kabupaten Wonogiri. 2021. Kabupaten Wonogiri Dalam Angka 2021.

BPS Kabupaten Wonogiri. 2022. Kabupaten Wonogiri Dalam Angka 2022.

Cutter, S. L. 2017. The Perilous Nature of Food Supplies: Natural Hazards, Social Vulnerability, and Disaster Resilience. Environment: Science and Policy for Sustainable Development, 59(1), 4–15. https://doi.org/10.1080/00139157.2017.1252603

Faradina, R., Iskandarini, I., & Lubis, S. N. 2018. Analisis Faktor-Faktor yang Mempengaruhi Pengeluaran Konsumsi Pangan Rumah Tangga (Studi Kasus: Desa Karang Gading, Kecamatan Secanggang, Kabupaten Langkat). Talenta Conference Series: Local Wisdom, Social, and Arts (LWSA), 1(1), 284–295.

Hanum, N. 2017. Analisis pengaruh pendapatan terhadap perilaku konsumsi mahasiswa Universitas Samudra di Kota Langsa. Jurnal Samudra Ekonomika, 1(2), 107–116.

Indiako, M. I. S. D. V., Ismono, R. H., & Soelaiman, A. 2014. Studi Perbandingan Pola Alokasi Lahan, Pengeluaran Beras Dan Pola Konsumsi Pangan Antara Petani Ubi Kayu Di Desa Pelaksana Dan Non Pelaksana Program Mp3L Di Kabupaten Lampung Selatan. Jurnal Ilmu-Ilmu Agribisnis, 2(4), 331–336.

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 8 (3): 827-841, November 2024

Iyiade Adetunji, A. 2021. 12 Food trends and development of new food products. In O. A. Ijabadeniyi (Ed.), Trends and Future Prospects (pp. 325–344). De Gruyter. https://doi.org/doi:10.1515/9783110667462-012

Jayati, L. D., Madanijah, S., & Khomsan, A. 2014. Pola konsumsi pangan, kebiasaan makan, dan densitas gizi pada masyarakat Kasepuhan Ciptagelar Jawa Barat. Penelitian Gizi Dan Makanan (The Journal of Nutrition and Food Research), 37(1), 33–42.

Marchianti, A. C. N., Sakinah, E. N., & Diniyah, N. 2017. The Effectiveness of Nutrition Counseling on The First Thousand Days of Life Group in Improving Knowledge and Attitude on Nutrition Awareness. Journal of Agromedicine and Medical Sciences, 3(3), 12–18.

Masthalina, H., Santosa, H., Sudaryat, E., & Zuska, F. 2021. Household Food Insecurity, Level of Nutritional Adequacy, and Nutritional Status of Toddlers in the Coastal Area of Central Tapanuli Regency. Open Access Macedonian Journal of Medical Sciences, 9(E), 1371–1375. https://doi.org/10.3889/oamjms.2021.7571

Muhammad, A. M., Napitupulu, D. M. T., Suandi, S., & Putra, T. S. 2022. Analisis Keterkaitan Lahan Pangan dengan Neraca Bahan Makanan dan Pola Pangan Harapan Kota Jambi. Jurnal Ilmiah Universitas Batanghari Jambi, 22(2), 858–861.

Munawar, M., Xu, S., Wen, Y., & Luqman, M. 2021. Resilience to Food Insecurity Among Rural Households in the Punjab, Pakistan. Sarhad Journal of Agriculture, 37(3). https://doi.org/10.17582/journal.sja/2021/37.3.754.762

Nugroho, R., Suprapto, F. A., Alfissa, N. Y. L., & Soraya, A. I. 2020. Dampak Covid 19 pada Ekonomi: Pendekatan Strategi Ketahanan Pangan. Rumah Reformasi Kebijakan [Institute for Policy Reform].

Nurhasan, M., Maulana, A. M., Ariesta, D. L., Usfar, A. A., Napitupulu, L., Rouw, A., Hurulean, F., Hapsari, A., Heatubun, C. D., & Ickowitz, A. 2022. Toward a Sustainable Food System in West Papua, Indonesia: Exploring the Links Between Dietary Transition, Food Security, and Forests. Frontiers in Sustainable Food Systems, 5. https://doi.org/10.3389/fsufs.2021.789186

Pinstrup-Andersen, P. 2009. Food security: definition and measurement. Food Security, 1(1), 5–7. https://doi.org/10.1007/s12571-008-0002-y

Rahayu, E. S. & Sutrisno, J. 2022. Analisis Kemiskinan Petani Ubi kayu: Implementasi Sustainable Development Goals (SDGs). Seminar Nasional Dalam Rangka Dies Natalis Ke-46 UNS, 643–651.

Rauf, R. A., Erny, N., Damayanti, L., & Malik, S. R. 2023. Food Security of Lowland Rice Farmers to Support Sustainable Food Development in Parigi Moutong District, Indonesia. Iop Conference Series Earth and Environmental Science, 1253(1), 012061. https://doi.org/10.1088/1755-1315/1253/1/012061

Setyaningsih, A. 2020. Kebijakan food security: arah kebijakan dan strategi ketahanan pangan pemerintah Indonesia. Journal of Governance Innovation, 2(1), 77–82.

Wahyuni, S., & Fauzi, T. (2016). Ketahanan Pangan: Suatu Analisis Kecukupan Energi dan Protein terhadap Kebutuhan Rumah Tangga Petani di Kabupaten Gayo Lues. Prosiding Seminar Nasional Biotik, 4(1), 236–243.

Wijaya-Erhardt, M., Muslimatun, S., & Erhardt, J. 2011. Fermented Soyabean and Vitamin C-Rich Fruit: A Possibility to Circumvent the Further Decrease of Iron Status Among Iron-Deficient Pregnant Women in Indonesia. Public Health Nutrition, 14(12), 2185–2196. https://doi.org/10.1017/s1368980011000954

Yu, Y., Feng, H., & Yuan, R. 2023. How Does Population Aging Affect China’s Energy Consumption? https://doi.org/10.21203/rs.3.rs-2716234/v1

Yudaningrum, A. 2011. Analisis hubungan proporsi pengeluaran dan konsumsi pangan dengan ketahanan pangan rumah tangga petani di Kabupaten Kulon Progo. Skripsi. Fakultas Pertanian Universitas Sebelas Maret. Surakarta.

ISSN 2580-0566; E-ISSN 2621-9778
http://ejournal2.undip.ac.id/index.php/agrisocionomics
Vol 8 (3): 827-841, November 2024

Yulida, R. 2012. Kontribusi usahatani lahan pekarangan terhadap ekonomi rumah tangga petani di Kecamatan Kerinci Kabupaten Pelalawan. Indonesian Journal of Agricultural Economics, 3(2), 135–154.

Zebua, A. 2019. Analisis Faktor-Faktor Yang Mempengaruhi Pola Konsumsi Pangan Rumahtangga Petani Sayuran Di Kabupaten Kampar. Jurnal Agribisnis, 21(2), 163–172.