


## Factors Affecting the Achievement of Food Consumption Patterns of Agritourism Workers

Nur Sabrina Alfain<sup>1</sup>, , Sugiyanto<sup>1</sup>, Edi Dwi Cahono<sup>1</sup>, Keppi Sukes<sup>1</sup>, Asihing Kustanti<sup>1</sup>

<sup>1</sup> Brawijaya University, Malang, INDONESIA.


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Corresponding Author:

 [nursabrinaalfain@gmail.com](mailto:nursabrinaalfain@gmail.com)  
(Nur Sabrina Alfain)

### ABSTRACT

*Household food consumption pattern is a habit or way of a family in choosing, processing, and consuming food daily. This pattern reflects the type, amount and quality of food consumed in a household. The problem that often occurs in household food consumption patterns is the imbalance of nutritional intake, which can be influenced by various factors both from socio-demographic and socio-economic factors. This study was conducted to analyze the achievement of household consumption patterns of agritourism workers and analyze what factors affect the achievement of household consumption patterns. The method used to analyze the achievement of food consumption patterns is through the calculation of EAR, PAR, DDP score, while for the analysis of influential factors using the ordinal logistic regression method with the help of SPSS 30 software. The results of the study explained that the EAR of agritourism worker households in Betet Village was 1946.37 kcal/cap/day or 92.68%EAR. Meanwhile, the PAR of tourist worker households in Betet Village was 53.52 grams/cap/day or 93.89%PAR and the DDP score was 93.16. Factors that influence EAR are the age of the housewife, the level of education of the housewife and the number of family members. While the factors that influence PAR are the age of the wife and household income.*

## 1. INTRODUCTION

Food is one of the basic human needs that must be fulfilled in a sustainable manner to ensure individual survival. In the context of human development, quality food and nutrition not only serve as a source of energy, but also play an important role in improving the quality of health, productivity, and social and economic welfare. The fulfillment of food needs can be reflected in household food consumption patterns. A good household food consumption pattern can be seen from the combination of commodities consumed daily, which consists of sources of carbohydrates, protein, fat, vegetables and fruits, and water and beverages. The achievement of household food consumption patterns can be seen from quantitative and qualitative aspects, by measuring energy and protein consumption based on recommended nutritional adequacy levels. Quantitative assessment of food consumption can be seen from the volume of food consumption (grams/cap/day and kilograms/cap/year), energy consumption (kcal/cap/day), and protein consumption (grams of protein/cap/day) (National Food Agency, 2024a). Meanwhile, the indicator used to assess the quality of food consumption is Desirable Dietary Pattern (DDP). DDP is a diverse food composition based on the energy balance of various food groups to meet nutritional needs in terms of both quantity and quality.

Agritourism is a type of tourist attraction that utilizes agricultural activities as the main attraction. This activity aims to increase insight, provide recreational experiences, and build business opportunities in the agricultural sector, including in the fields of food crops, horticulture, plantations, fisheries, and livestock (Utama & Junaedi, 2015). The development of agritourism, especially in Betet Village, has the potential to provide economic benefits for the local community and increase local government revenue. As researched by (Budi *et al.*, 2020) that the development of

agritourism in an area has a positive impact on the community's economic activities, namely it can provide new fields for the community, increase the community's economic income, and have a social impact on the village community, namely the wider thinking to be more creative. The development of agritourism in Betet Village has an impact on the economic activities of the village community. The development of agritourism in Betet Village has an impact on the economic activities of the village community. Before the development of agritourism, the majority of community activities were only related to agricultural activities. With the development of agritourism, the people of Betet Village now have new social and economic activities related to tourism. Considering these new economic activities, it is assumed that the income of the local community will increase and this will affect the consumption patterns of each household. (Kurniawan *et al.*, 2022) stated that the development of Bontang Mangrove Park tourism, has caused the economy of the surrounding community grew quite rapidly with the emergence of new businesses such as the provision of parking lots, food and beverage businesses. Agritourism development also provides benefits for community social development, a decrease in poverty levels accompanied by an increase in the community's economy (Puspitasari *et al.*, 2024). (Alfiati, 2018) states that income has a significant effect on household food consumption patterns. With this social phenomenon, this study examined the achievement of food consumption patterns of agritourism worker households in Betet Village and its influencing factors. This study is expected to provide readers with an understanding of food consumption patterns. Agritourism workers in Betet Village can provide the government with information regarding community food security, especially for agritourism workers in Betet Village, improve community welfare, and serve as a basis for further policy and research in the field of tourism and the achievement of food consumption patterns.

## 2. METHODS

This research was conducted in Betet Village, Ngronggot District, Nganjuk Regency - East Java. Betet Village is one of the villages in Nganjuk Regency where the majority of the population work as farmers. However, in 2017 Betet Village experienced progress in village development with the construction of the “Wisata Tani Betet” agritourism. This tour was initiated by the Betet village youth who wanted to normalize the Apur River.

The population in this study is agritourism workers in Betet Village. Agritourism workers include all individuals directly involved in the operations and management of “Wista Tani Betet”, including guides, traders, officers, managers, and other workers who play a role in various aspects of tourism development and management with a total population of 42 people. The determination of the sample size is calculated based on the Slovin formula with a 10% error rate as follows (Sugiyono, 2017):

$$n = \frac{N}{1+N(e)^2} \quad (1)$$

where  $n$  is number of samples,  $N$  is total population, and  $e$  is error tolerance limit. With a total population of 42, it can be calculated that sample size is 30.

In this study, there were 2 (two) analyses, namely the analysis of the achievement of food consumption patterns and the analysis of factors influencing the achievement of food consumption patterns.

### 2.1. Analysis of Food Consumption Pattern Achievements

#### 2.1.1. Quantity Aspect Measurement (EAR & PAR)

In general, the assessment of the amount of nutrients consumed is calculated as follows (Praza & Shamadiyah, 2020):

$$G_{ij} = \frac{BP_j}{100} \times \frac{BD_j}{100} \times KG_{ij} \quad (2)$$

where  $G_{ij}$  is nutrients consumed from food  $j$ ;  $BP_j$  is weight of food  $j$  consumed (g);  $BD_j$  is edible portion (in % or g/100g of food  $j$ ); and  $KG_{ij}$  is content of specific nutrient ( $i$ ) of 100 g of food  $j$ .

In accordance with Equation (2), the following formula was used to measure the amount of energy consumption:

$$GE_j = \frac{BP_j}{100} \times \frac{BD_j}{100} \times KGE_j \quad (3)$$

where  $GE_j$  is the energy consumed from food  $j$ . Whereas, protein consumption was calculated using the formula:

$$GP_j = \frac{BP_j}{100} \times \frac{BD_j}{100} \times KGP_j \quad (4)$$

where  $GP_j$  is the protein consumed from food  $j$ .

The quantity of food consumption is assessed by the volume of food consumed and the consumption of nutrients contained in foodstuffs. To assess food consumption quantitatively, the parameters of Energy Adequacy Level (EAL) and Protein Adequacy Level (PAL) are used.

$$EAL = \frac{\Sigma \text{energy consumption}}{\text{Recommended EAR}} \times 100\% \quad (5)$$

$$PAL = \frac{\Sigma \text{protein consumption}}{\text{Recommended PAR}} \times 100\% \quad (6)$$

where EAL and PAL are presented in %;  $\Sigma$  energy consumption is total energy consumption (kcal/capita/day); and  $\Sigma$  protein consumption is total protein consumption (grams/capita/day).

### 2.1.2. Desirable Dietary Pattern (DDP)

The measurement of quality aspects can be measured by calculating the DDP score. The stages of DDP calculation are as follows:

- a. Food Grouping
- b. Conversion of shapes, types, and units
- c. Calculating sub-total energy content by food group
- d. Calculating the actual total energy of all food groups

*Total energy of 9 food groups = Energy of cereals group + tubers + ..... + energy of other groups.*

- e. Calculating the energy contribution of each food group to the actual total energy (%)

$$\frac{\text{food group energy}}{\text{actual total energy}} \times 100\% \quad (7)$$

- f. Calculating the energy contribution of each food group to the Energy Adequacy Rate (%EAR).

$$\frac{\text{food group energy}}{\text{EAR Consumption}} \times 100\% \quad (8)$$

- g. Calculating the actual score

*Actual score = actual energy contribution of each food group x weight of each food group*

- h. Calculating EAR score

*EAR score = % EAR of each food group x weight*

- i. Calculating DDP Score

The calculation of DDP scores for each food group is as follows:

*If the EAR score is higher than the maximum score, the maximum score is used.*

*If the EAR score is lower than the maximum score, the EAR score is used.*

- j. Calculating the Total Score of the Desirable Dietary Pattern

*DDP score = DDP score of cereals + tubers + ..... + DDP score of other groups.*

### 2.2. Analysis of Factors Affecting the Achievement of Food Consumption Patterns

The variables used in this study were divided into two, namely the response variable ( $Y$ ) and the predictor variable ( $X$ ) can be seen in Table 1. The table explains that this study identified four predictor variables related to the age of housewives, number of family members, education level of housewives, income against 2 response variables namely level of energy consumption and level of protein consumption.

Table 1. Research variables

No.	Variables	Operational Definition	Measurement Parameters
1.	Age of Housewife (X1)	The number of years of life of the respondent calculated from birth to the time of the study.	1. Young (15 - 29 years old) 2. Adults (30 - 49 years old) 3. Old ( $\geq 50$ years old)
2.	Number of family members (X2)	The total number of family members either living in the same house or not whose living expenses are covered by the head of the family.	1. Small Family (1-3 family members) 2. Medium Family (4-6 family members) 3. Large Family ( $\geq 6$ family members)
3.	Education level of housewives (X3)	The level of formal schooling that has been completed and received recognition for completing the program.	1. Low ( $\leq 6$ years of SD/SR), 2. Medium (7 - 12 years of high school), 3. Higher ( $\geq 13$ years Diploma/PT).
4.	Income (X4)	Total income earned by an individual or family in one month from various sources	1. Low (<Rp 1,500,000) 2. Medium (IDR 1,500,000 - IDR 2,500,000) 3. High (> IDR 2,500,000)
5.	Energy consumption level (Y1)	Total food consumption is based on the total energy consumed by households in a day using the 7 x 24-hour recall method with units of kcal/capita/day and grams/capita/day.	1. severe deficit (meets <70% of RDA) 2. moderate deficit (meets 70-79% of RDA) 3. mild deficit (meets <90% of RDA) 4. adequate (meets 90-119% of RDA) 5. more (>120% RDA)
6.	Protein consumption level (Y2)	Total food consumption is based on the total protein consumed by households in a day using the 7 x 24 hour recall method with units of kcal/capita/day and grams/capita/day.	1. severe deficit (meets <70% of RDA) 2. moderate deficit (meets 70-79% of RDA) 3. mild deficit (meets <90% of RDA) 4. adequate (meets 90-119% of RDA) 5. more (>120% RDA)
7.	DDP Score	The DDP score in question is the score of the family's Expected Dietary Pattern obtained by a consumption survey using the household food recording method in a day with a 7×24 h recall method.	1. Very low (<55%) 2. Low (55-69%) 3. Fair (70-84%) 4. Good ( $\geq 85\%$ )

The use of the four predictor variables ( $X$ ) in this study aims to see the effect of demographic, social and economic factors of a household on the achievement of household food consumption patterns. The age of the mother is assumed to influence the experience and knowledge in managing the family's food consumption pattern. Likewise, with the number of family members, the assumption is that the more family members, the greater the food needs, which can affect the adequacy of energy and protein consumed. Meanwhile, the level of education of housewives plays an important role in understanding nutrition and healthy eating patterns, so that it can influence the selection of quality food ingredients. Household income determines the purchasing power of various types of food, both in terms of quality and quantity. The use of response variables ( $Y$ ), including Energy Consumption Level, Protein Consumption Level and DDP score, is an indicator for assessing the achievement of food consumption patterns based on Regulation of the National Food Agency of Indonesia No. 11 of 2023 concerning DDP.

Data analysis was carried out with the help of SPSS 30.0.0 software. The stages of data analysis carried out in this study can be explained as follows (Talakua, 2019). The first step in ordinal logistic regression analysis is to analyze descriptively by making cross tabulations. Second, estimating the parameters of the ordinal logistic regression model, then testing the significance of the parameters both simultaneously and partially. The last is to test the suitability of the model and conclude the research results.

### 3. RESULTS AND DISCUSSION

#### 3.1. Household Food Consumption Pattern of Agritourism Workers in Betet Village

##### 3.1.1. Quantity Aspect

In terms of quantity, household food consumption patterns were analyzed using AKG, which includes EAR and PAR.

### A. Energy Adequacy Rate (EAR)

EAR (Energy Adequacy Rate) is the amount of energy needed by individuals or groups in one day to carry out activities and maintain optimal body health. Based on the recommendations of the National Widyakarya Food and Nutrition (WNPG) in 2018, the recommended EAR is 2,100 kcal/cap/day. The Ministry of Health categorizes the Energy Consumption Level (EAL) criteria into five categories, namely: [1 = severe deficit (meets <70% of AKG); 2 = moderate deficit (meets 70-79% of AKG); 3 = mild deficit (meets <90% of AKG); 4 = sufficient (meets 90-119% of AKG); 5 = more ( $\geq$  120% of AKG)].

From the results of the study, it was found that the average household energy consumption of agritourism workers was 1946.37 kcal/cap/day or EAL of 92.68%. The average household energy consumption of agritourism workers is in the sufficient category. For the distribution of household consumption levels of agritourism workers can be seen in Table 2.

The data presented in the Table 2 shows the distribution of energy consumption levels of tourist worker households in Betet Village. The data presented in the table above shows the distribution of household energy consumption levels of agritourism workers in Betet Village. From the data, it can be seen that the average age of housewives is in the adult category (30–49 years) and the average household protein consumption level is in the category <90% (mild deficit). Furthermore, the level of energy consumption of agritourism worker households can also be seen based on the level of education of housewives. From this data, it can be seen that the average level of education of housewives is in the moderate category (7–12 years of junior/senior high school) and from the education factor of housewives the average level of energy consumption is <90% (mild deficit). Based on the household income factor, it can be seen that the average household income is in the high category (> IDR 2,500,000) from the household income factor, the average energy consumption level is <90% (mild deficit). Meanwhile, the distribution of the energy consumption level of agritourism worker households is seen based on the number of family members. It can be seen that the average number of family members is in the small family category (1-3 members) with an average energy consumption level of <90% (mild deficit).

Table 2. Distribution of energy consumption level (EAL) of worker households in Betet Village Agritourism

		Percentage per Factor and Category of Energy Consumption Level												
Factor	Category	Total	severe deficit (meets <70% of AKG)				moderate deficit (meets 70-79% of AKG)		mild deficit (meets <90% of AKG)		adequate (meets 90- 119% of AKG)		more (>120% AKG)	
			N	%	n	%	n	%	n	%	n	%	n	%
X1	Young (15 - 29 years)	0	0	0	0	0	0	0	0	0	0	0	0	0
	Adults (30 - 49 years)	16	53	0	0	2	12,5	11	68.75	2	12.5	1	6.25	
	Old (≥ 50 years)	14	47	0	0	0	0	6	43	8	57	0	0	
X2	Low (≤ 6 years of ES)	11	37	0	0	0	0	6	55	5	45	0	0	
	Medium (7 - 12 years Junior-Senior High)	17	56	0	0	2	12	10	59	5	29	0	0	
	High (≥ 13 years diploma/bachelor)	2	7	0	0	0	0	1	50	0	0	1	50	
X3	Low (<Rp 1,500,000)	7	23	0	0	0	0	5	71	2	29	0	0	
	Medium (IDR 1,500,000 - IDR 2,500,000)	11	37	0	0	1	10	5	45	5	45	0	0	
	High (> IDR 2,500,000)	12	40	0	0	1	8	7	59	3	25	1	8	
X4	Small Family (1-3 family members)	16	53	0	0	0	0	9	56.25	6	37.5	1	6.25	
	Medium Family (4-6 family members)	13	43	0	0	2	15	7	54	4	31	0	0	
	Large Family (≥6 family members)	1	4	0	0	0	0	1	100	0	0	0	0	

## B. Protein Adequacy Rate (PAR)

PAR (Protein Adequacy Rate) is the recommended amount of protein to be consumed by an individual in a day to fulfill the body's needs. PAR is part of the Nutritional Adequacy Score (AKG) set by the Ministry of Health. Based on the recommendations of the Widyakarya Nasional Pangan dan Gizi (WNPG) in 2018, the recommended PAR is 57 grams/cap/day. Similar to EAL, the Ministry of Health categorizes the Protein Adequacy Level (PAL) criteria into five categories, namely: [1 = severe deficit (meets <70% of AKG); 2 = moderate deficit (meets 70-79% of AKG); 3 = mild deficit (meets <90% of AKG); 4 = sufficient (meets 90-119% of AKG); 5 = more ( $\geq 120\%$  of AKG)].

From the results of the study, it was found that the average protein consumption of tourist worker households was 53.52 grams/cap/day or a crime scene of 93.89%. The average household protein consumption of agritourism workers is in the sufficient category. For the distribution of protein consumption levels of tourist worker households can be seen in Table 3.

Table 3. Distribution of Protein Adequacy Level (PAL) of worker households in Betet Village Agritourism

Factor	Category	Percentage per Factor and Category of Protein Adequacy Level											
		Total		severe deficit (<70% of AKG)		moderate deficit (70-79% of AKG)		mild deficit (<90% of AKG)		adequate (90-119% of AKG)		more (>120% of AKG)	
		N	%	n	%	n	%	n	%	n	%	n	%
X1 (Age)	Young (15 - 29 years)	0	0	0	0	0	0	0	0	0	0	0	0
	Adults (30 - 49 years)	16	53	0	0	4	25	8	50	3	18.75	1	6.25
	Old ( $\geq 50$ years)	14	47	0	0	6	43	5	36	3	21	0	0
X2 (Education)	Low ( $\leq 6$ years ES)	11	37	0	0	3	27	6	55	2	18	0	0
	Medium (7 - 12 years HS)	17	56	0	0	6	35	7	41	4	24	0	0
	High ( $\geq 13$ years D/B)	2	7	0	0	1	50	0	0	0	0	1	50
X3 (Income, million IDR)	Low (<1,5 million)	7	23	0	0	5	71	2	29	0	0	0	0
	Medium (1,5 - 2,5)	11	37	0	0	3	27	6	55	2	18	0	0
	High (> IDR 2,500,000)	12	40	0	0	2	17	5	42	4	33	1	8
X4 (Family Size)	Small (1-3 members)	16	53	0	0	6	37.5	7	43.75	2	12.5	1	6.25
	Medium (4-6 members)	13	43	0	0	3	23	6	46	4	31	0	0
	Large ( $\geq 6$ members)	1	4	0	0	0	0	1	100	0	0	0	0

Note: ES = Elementary School; HS = Junior – Senior High Sechool; D/B = diploma/bachelor

The data presented in the Table 3 shows the distribution of protein adequacy levels of Agritourism Workers households in Betet Village. The data presented in the table above shows the distribution of household protein consumption levels of agritourism workers in Betet Village. From this data, it can be seen that the average age of housewives is in the adult category (30–49 years) and the average household protein consumption level is in the category <90% (mild deficit). Furthermore, the level of household protein consumption of agritourism workers can also be seen based on the level of education of housewives. From this data, it can be seen that the average level of education of housewives is in the moderate category (7–12 years of junior/senior high school) and from the education factor of housewives the average level of protein consumption is <90% (mild deficit). Based on the household income factor, it can be seen that the average household income is in the high category (> IDR 2,500,000) from the household income factor, the average protein consumption level is <90% (mild deficit). Meanwhile, the distribution of the energy consumption level of agritourism worker households is seen based on the number of family members. It can be seen that the average number of family members is in the small family category (1-3 members) with an average protein consumption level of <90% (mild deficit).

### 3.1.2. Quality Aspects

The quality of food consumption can be reflected in the level of food diversity consumed by a household. The parameter used in assessing the quality of household consumption is through the Desirable Dietary Pattern (DDP)

score. The DDP score is an indicator of the nutritional quality and diversity of food consumption so that it can be used to plan food consumption needs. The maximum DDP score is 100. The higher the DDP score, the more diverse and balanced the food consumption of the population (National Food Agency, 2024a). The results of the calculation of the DDP score of tourist worker households in Betet Village can be seen in Table 4.

Table 4. DDP Score of workers households in Betet Village Agritourism

No. Food group	Calculation of Desirable Dietary Pattern (DDP) Score						
	Amount (g)	Energy (kcal)	% EAR	Weight	EAR Score	Max Score	DDP Score
1. Cereals	297.73	884.17	42.10	0.5	21.05	25	21.05
2. Tubers	115.14	185.56	8.84	0.5	4.42	2.5	2.5
3. Animal food	116.47	236.60	11.27	2	22.53	24	22.53
4. Oils and fats	49.63	154.20	7.34	0.5	3.65	5	3.65
5. Oily fruits/seeds	22.23	39.15	1.86	0.5	0.93	1	0.93
6. Nuts	105.57	170.75	8.13	2	16.26	10	10
7. Sugar	30.09	118.54	5.64	0.5	2.82	2.5	2.5
8. Vegetable and fruit	299.80	157.11	7.48	5	37.41	30	30
9. Various spices and drinks	14.40	0.29	0.01	0	0	0	0
<b>Total</b>	<b>1051.06</b>	<b>1946.37</b>	<b>92.68</b>			<b>100</b>	<b>93.16</b>

Table 4 shows that the DDP score of Betet Village Agritourism Workers households is 93.16. The score was generated from energy consumption of 1946.37 kcal/cap/day and protein consumption of 53.52 g/cap/day. The DDP score of agritourism worker households in Betet Village is in the high category ( $\geq 85$ ). This score has surpassed the 2023 DDP value for Nganjuk Regency, which is 92.9 (National Food Agency, 2024b). The increase in the DDP score can be increased by increasing the amount of consumption of food groups that have not met the maximum score, namely (rice, animal food, oil and fat, and oily fruits/seeds). In addition, improving the quality of food consumption can also pay attention to the factors that influence it.

Table 4 also shows that the highest % EAR of agritourism workers households in Betet Village is in the cereals food group and then followed by the animal food group. The results of research conducted by (Chiaka *et al.*, 2022) stated that the percentage of household income is more dominantly spent on cereals and starchy roots as the main source of calories for households in Nigeria. The consumption of each food group is also influenced by the income of a household, this is mentioned in the study (John *et al.*, 2021) household legume intake is positively associated with household monthly income and expenditure. However, when viewed from the actual weight of food groups consumed by tourist worker households in Betet Village, the highest is in the fruit and vegetable group. In research (Hassan *et al.*, 2020) it was found that households in Lahore made vegetables a must in their dishes. Research conducted by (Kharisma *et al.*, 2024) in Bali found that the highest increase in average per capita food expenditure occurred in the consumption of tubers (54.82%), vegetables (25.77%), and nuts (17.5%). Research on food consumption patterns by (Sugiyanto & Pintakami, 2023) also stated that vegetable and fruit group, animal food, and cereals are still being the three groups of food materials that most dominantly contribute to the acquisition of DDP scores in Malang Raya.

### 3.2. Factors Affecting the Energy Adequacy Rate (EAR) of Agritourism Workers Households

Furthermore, further analysis was carried out with ordinal logistic regression to determine the effect of each factor both simultaneously and partially on the Energy Adequacy Rate (EAR) and Protein Adequacy Rate (PAR). The results of the data analysis using SPSS 30 are explained as follows.

#### 3.2.1. Model fit test

Test the suitability of the ordinal logistic regression equation model with the Deviance test. In this case, the test carried out to determine whether the ordinal logistic regression equation model obtained is appropriate or not with the following hypothesis.

H0 : Model fit ( $D < \chi^2$ ,  $p\text{-value} > \alpha = 0.05$ )

H1 : Model does not fit  $D > \chi^2$ ,  $p\text{-value} < \alpha = 0.05$ )

The results of the ordinal logistic regression equation model fit test using SPSS 30 are shown in Table 5. Based on the results of Table 5, it can be seen that the acquisition of the  $D$  value =  $46.532 < \chi^2_{(0.05; 81)} = 103.009$  and  $p$ -value =  $0.999 > 0.05$ . So it can be concluded that the ordinal logistic regression model formed is appropriate or suitable for observational data or there is no significant difference between the observation results and the possible predicted results of the model, so the decision to accept  $H_0$  is obtained.

Table 5. Goodness of Fit output

	Chi-Square	df	Sig.
Pearson	58.064	81	0.975
Deviance	46.532	81	0.999

Note: Link function : Logit.

### 3.2.2. Concurrent test

The simultaneous test was conducted to assess the suitability of the model formed by comparing the model with predictor variables and the model without predictor variables. The test is conducted using the likelihood ratio-test with the following hypothesis.

$H_0 : \beta_1 = \beta_2 = 0$  ( $G^2 < \chi^2_{\text{table}}, p\text{-value} > \alpha = 0.05$ )

$H_1 : \text{At least one } \beta_i \neq 0, i = 1, 2$  ( $G^2 > \chi^2_{\text{table}}, p\text{-value} < \alpha = 0.05$ )

The test results using SPSS 30 are shown in Table 6 Model Fitting Information Output below. Based on the test results above, it can be seen that there is a decrease in the -2 Log Likelihood value from intercept only (without predictor variables) to final (including predictor variables), namely 58.918 to 46.532. The table also informs that the test statistic  $G^2 = 12.386 > \chi^2_{(0.05; 6)} = 12.592$  and  $p$ -value =  $0.044 < 0.05$ . Therefore, reject  $H_0$ , meaning that the model with predictor variables is better than the model with intercept only (without predictor variables) and this result indicates that at least one parameter is significant, so further partial testing is needed.

Table 6. Model Fitting Information Output

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	58.918			
Final	46.532	12.386	6	0.044

Note: Link function : Logit.

### 3.2.3. Partial test

The test statistic used for the partial test is the Wald (W) test. This test is used to determine which predictor variables are significant. The hypothesis is as follows:  $H_0 : \beta_j = 0$  versus  $H_1 : \beta_j \neq 0$  with  $j = 1, 2$ . Partial test results using SPSS 30 can be seen in Table 7 Output Parameter Estimates. Based on the results presented in the Parameter Estimates Output table, it can be seen that the predictor variables  $X_1$ ,  $X_2$ , and  $X_{3,1}$  have a  $p$ -value  $< 0.05$  while the other variables have a  $p$ -value  $> 0.05$ . The results of this test indicate that the variables  $X_1$ ,  $X_2$ , and  $X_{3,1}$  have a partially significant effect on the EAR of tourist worker households. The logit model equation above shows that there are 3 variables that affect the EAR achievements of tourist *worker* households in Betet Village. And the equation also shows that partially the income variable does not significantly affect the EAR of tourist worker households.

The interpretation of the model above refers to the Exp ( $\beta$ ) value or odds ratio value given in the Parameter Estimates table. Variable  $X_1$  obtained the value of Exp (0.151) = 1.163 which means that the age of the housewife has a significant influence on the fulfillment of EAR of a family. Variable  $X_2$  obtained odd ratio value Exp (-0.804) = 0.448 which means that the number of family members has a significant influence on the adequacy of family EAR. The next variable  $X_{3,1}$  obtained Exp (-3,482) = 0.031 which means that the mother's education also has a significant influence on the fulfillment of family EAR.

Table 7. Parameter Estimates Output

		Estimate	Std. Error	Wald	df	Sig.	Odd Ratio Exp (β)
Threshold	[Y=1]	-2.126	3.072	0.479	1	0.489	
	[Y=2]	2.048	3.143	0.424	1	0.515	
	[Y=3]	5.618	3.293	2.911	1	0.088	
Location	[X1]	0.151	0.072	4.441	1	0.035	1.163
	[X2]	-0.804	0.404	3.97	1	0.046	0.448
	[X3=1]	-3.482	1.745	3.981	1	0.046	0.031
	[X3=2]	-2.859	1.533	3.477	1	0.062	
	[X3=3]	0 <sup>a</sup>			0		
	[X4=1]	-0.605	1.126	0.289	1	0.591	
	[X4=2]	-0.729	1.04	0.492	1	0.483	
	[X4=3]	0 <sup>a</sup>			0		

Link function: Logit.

Furthermore, a *logit* model equation can be formed by including significant predictor variables. In this case, because the response variable consists of 5 categories, 3 logit model equations are formed as follows.

$$\text{Logit}(Y1) = \log\left(\frac{y1}{1-y1}\right) = -2.126 + 0.151X_1 - 0.804X_2 - 3.482X_{3,1} \quad (9)$$

$$\text{Logit}(Y1) = \log\left(\frac{y1}{1-y1}\right) = 2.048 + 0.151X_1 - 0.804X_2 - 3.482X_{3,1} \quad (10)$$

$$\text{Logit}(Y1) = \log\left(\frac{y1}{1-y1}\right) = 5.618 + 0.151X_1 - 0.804X_2 - 3.482X_{3,1} \quad (11)$$

Descriptively, the average age of housewives of Agritourism workers in Betet Village is 30-49 years old. At this age, *mothers* generally have a better understanding of nutrition and experience managing households. With a more mature age, they can compile a nutritious meal menu, choose energy-rich foods, and form family eating habits that support energy adequacy. This is in line with research (Dewanti, 2020; Timisela *et al.*, 2021) that as a person gets older, his experience also increases, such as experience about the impact of food consumed on the body over a period of time. Regarding the variable number of family members, the average number of family members of agritourism workers is in the small family category (1-3 people). With the average number of household members in the small family category, the burden of energy needs is easier to fulfill compared to larger families. This is due to more efficient resource allocation and more adequate food distribution per individual in small families. Households have a wider choice of the type of food to be consumed because it is only used to fulfill a few people. This is in line with the results of research (Budiraharti *et al.*, 2022) which explains that the more the number of household members, the less protein and energy consumption. Consumption patterns and levels are influenced by the number of household members, where the fewer the number of household members, the fewer needs that must be met (Aziz *et al.*, 2019). Furthermore, the education variable of housewives is in the medium category (7-12 years of junior high school/high school). Mothers with higher education tend to have better nutritional knowledge, which has a positive impact on meeting family energy needs. It was also mentioned in research (Purwati, 2022) that the level of education of housewives has an influence on the achievement of consumption patterns in the household. With higher education, housewives are expected to have sufficient understanding of nutrition and health. This knowledge allows them to choose and process food in accordance with family energy needs, so that EAR can be achieved. It is also mentioned in research (Wittig *et al.*, 2017) that good knowledge also leads to healthy nutritional behavior such as paying attention to meal frequency and time or meal times will form a good distribution of nutritional intake.

### 3.3. Factors Affecting the PAR of Tourist Worker Households

The next analysis is the analysis of factors affecting the PAR of tourist worker households in Betet Village. The steps taken are the same as the analysis of factors affecting EAR above, starting with the model fit test, simultaneous test and partial test.

### 3.3.1. Model fit test

Test the suitability of the ordinal logistic regression equation model with the Deviance test. In this case, the test is conducted to determine whether the ordinal logistic regression equation model obtained is appropriate or not with the following hypothesis. The results of the fit test of the ordinal logistic regression equation model using SPSS 30 are shown in Table 8.

$H_0$  : Model fit ( $D < \chi^2$ ,  $p$  - value  $> \alpha = 0.05$ ) versus  $H_1$  : Model does not fit  $D > \chi^2$ ,  $p$  - value  $< \alpha = 0.05$ )

Table 8. Goodness of Fit Output

	Chi-Square	df	Sig.
Pearson	70.006	81	.803
Deviance	56.389	81	.983

Note: Link function: Logit.

Based on the results of Table 8, it can be seen that the acquisition of the value of  $D = 56.389 < \chi^2_{(0.05;81)} = 103.009$  and  $p\text{-value} = 0.983 > 0.05$ . So it can be concluded that the ordinal logistic regression model formed is appropriate/suitable for observational data or there is no significant difference between the observation results and the possible predicted results of the model, so the decision to Accept  $H_0$  is obtained.

### 3.3.2. Concurrent Test

The simultaneous test was conducted to assess the suitability of the model formed by comparing the model with predictor variables and the model without predictor variables. The test is conducted using the likelihood ratio-test with the following hypothesis. The test results using SPSS 30 are shown in Table 9.

$H_0$  :  $\beta_1 = \beta_2 = 0$  ( $G^2 < \chi^2_{\text{table}}$ ,  $p\text{-value} > \alpha = 0.05$ )

$H_1$  : At least one  $\beta_i \neq 0$ ,  $i = 1, 2$  ( $G^2 > \chi^2_{\text{table}}$ ,  $p\text{-value} < \alpha = 0.05$ )

Table 9. Model fitting information output

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	69.830			
Final	56.389	13.442	6	.037

Note: Link function: Logit.

Based on the test results above, it can be seen that there is a decrease in the -2 Log Likelihood value from intercept only (without predictor variables) to final (including predictor variables), namely 69.830 to 56.389. The table also informs that the test statistic  $G^2 = 13.442 > \chi^2_{(0.05; 6)} = 12.592$  and  $p\text{-value} = 0.037 < 0.05$ . Thus, reject  $H_0$ , meaning that the model with predictor variables is better than the model with intercept only (without predictor variables) and this result indicates that at least one parameter is significant, so further partial testing is needed.

### 3.3.3. Partial Test

The test statistic used for the partial test is the Wald (W) test. This test is used to determine which predictor variables are significant. The hypothesis can be presented as  $H_0$  :  $\beta_j = 0$  versus  $H_1$  :  $\beta_j \neq 0$  with  $j = 1, 2$ . Partial test results using SPSS 30 can be seen in Table 10 Output Parameter Estimates. Based on the results presented in the Parameter Estimates Output table, it can be seen that the predictor variables  $X_1$  and  $X_{4.1}$  have a  $p\text{-value} < 0.05$  while the other variables have a  $p\text{-value} > 0.05$ . The results of this test indicate that the variables  $X_1$  and  $X_{4.1}$  have a significant influence partially on the PAR of Betet Village tourist worker households. Furthermore, a logit model equation can be formed by including significant predictor variables. In this case, because the response variable consists of 5 categories, 3 logit model equations are formed as follows.

Table 10 . Parameter Estimates Output

		Estimate	Std. Error	Wald	df	Sig.	Odd Ratio Exp (β)
Threshold	[Y=1]	-7.686	3.442	4.985	1	0.026	
	[Y=2]	-5.097	3.235	2.483	1	0.115	
	[Y=3]	-2.659	3.268	0.662	1	0.416	
	[X1]	-0.142	0.071	4.051	1	0.044	0.868
	[X2]	0.328	0.353	0.863	1	0.353	
Location	[X3=1]	1.301	1.789	0.529	1	0.467	
	[X3=2]	-0.855	1.509	0.321	1	0.571	
	[X3=3]	0 <sup>a</sup>	.	.	0	.	
	[X4=1]	-2.738	1.186	5.327	1	0.021	0.065
	[X4=2]	-1.082	0.95	1.296	1	0.255	
	[X4=3]	0 <sup>a</sup>	.	.	0	.	

Note: Link function: Logit.

$$\text{Logit} (Y1) = \log \left( \frac{y1}{1-y1} \right) = -7.686 - 0.142X_1 - 2.738X_{4,1} \quad (12)$$

$$\text{Logit} (Y1) = \log \left( \frac{y1}{1-y1} \right) = -5.097 - 0.142X_1 - 2.738X_{4,1} \quad (13)$$

$$\text{Logit} (Y1) = \log \left( \frac{y1}{1-y1} \right) = -2.659 - 0.142X_1 - 2.738X_{4,1} \quad (14)$$

The logit model equation above shows that there are 2 variables that affect the PAR of tourist worker households in Betet Village. The equation also shows that partially the variables of the number of family members and education of the housewife do not have a significant effect on the PAR of tourist worker households.

The interpretation of the above model refers to the Exp (β) value or odds ratio value given in the Parameter Estimates table. Variable  $X_1$  obtained the value of Exp (-0.142) = 0.868 which means that the age of the housewife has a significant influence on the fulfillment of the PAR of a family. Variable  $X_{4,1}$  obtained odds ratio value Exp (-2.738) = 0.065 which means that family income has a significant influence on the adequacy of a family's PAR.

Descriptively, the average age of housewives of agritourism workers in Betet Village is 30-49 years old. Mothers who are in the adult age range generally have experience and maturity in managing family nutritional needs, including protein intake. Based on research (Feil *et al.*, 2020), people who are classified as young adults have more motivation to buy nutritious food. The next variable that has a significant effect on the PAR of Betet Village agritourism worker households is household income. The average household income of agritourism workers in Betet Village is in the high category (> Rp 2,500,000). High-income households have a greater chance of achieving an optimal PAR than low-income households. A higher income will allow a household to have a better variety of food consumption and can ensure optimal nutritional balance. Research conducted by (Drewnowski *et al.*, 2020) states that respondents who have higher incomes tend to add animal protein consumption rather than vegetable protein, while respondents who have lower incomes prioritize the consumption of vegetable protein, cereals, and mostly rice. (Ismail *et al.*, 2023) stated that households with many family members and low economic levels experience imbalances in consumption of both food and goods and services. (Jia *et al.*, 2023) also mentioned that the influence of economic factors is relatively higher than other factors in terms of changes in consumption patterns in Bangladesh.

#### 4. CONCLUSIONS

Based on the results of the study, it can be concluded that the energy adequacy rate (EAR) of tourist worker households in Betet Village is 1946.37 kcal/cap/day or the energy adequacy rate (EAL) is 92.68%. Meanwhile, the protein adequacy rate (PAR) of tourist worker households in the village reached 53.52 grams/cap/day or a protein adequacy level (PAL) of 93.89%. From these EAR and PAR figures, the Desirable Dietary Pattern (DDP) score of tourist worker households in Betet Village is 93.16, which is categorized as good. Further analysis shows that there are three factors that partially influence the EAR, namely the age of the housewife, the education level of the housewife,

and the number of family members. Meanwhile, the factors that influence PAR are the age of the housewife and household income. Thus, it can be concluded that the socioeconomic characteristics of the family, especially the age and education of the housewife and income level, play an important role in achieving energy and protein adequacy in the households of agritourism workers in Betet Village. Efforts to improve the fulfillment of family nutrition can be done by increasing nutrition education for housewives and improving access to nutritious and quality food sources.

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