



ACCOMPANIMENT ROLE OF AGRICULTURAL EXTENSION WORKER IN AN ATTEMPT TO INCREASE THE FOOD CONSUMPTION PATTERN

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1701

ABSTRACT

The present study is focused on (1) identifying the consumed food elements in an attempt to fulfil ideal food consumption pattern for coffee farmers, (2) describing the accompaniment level of agricultural extension workers, (3) analyzing the correlation between accompaniment level of agricultural extension and the food consumption pattern of coffee farmers in achieving energy adequacy ratio (EAR), (4) analyzing the correlation between accompaniment level of agricultural extension and the food consumption pattern of coffee farmers in achieving protein adequacy ratio (PAR), (5) analyzing the influencing factors of food consumption pattern of coffee farmers. This study was a quantitative study using the 7x24-hour food recall method and Likert scale to measure the accompaniment role of agricultural extension. Rank Spearman correlation analysis and multiple linear regression analysis were used to analyze the influencing factors of the consumption patterns of coffee farmers. The food consumption pattern was measured from energy/protein adequacy ratios and the quality based on the aspect that can be known from the hope food pattern score (HFP). Results demonstrated rice is the main food element, while tofu and tempeh are the main side dish consumed by coffee farmers in Dampit Subdistrict. The average EAR and PAR reached 1,643.42 kcal/capita/day and 52.54 grams/capita/day. The results implied that the ratio was below standard. Moreover, the uneven accompaniment role of in food consumption pattern caused no relationship except the role of educators toward EAR. Last, the influencing factors of EAR were the number of family members, expenditure on food, and the frequency of eating, while those that affect the actual PAR were the number of family members and the farming experience.

Keywords: AER, accompaniment role of agricultural extension worker, coffee farmer, consumption pattern, HFP, PAR

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INTRODUCTION

Humans have a basic physiological requirement for eating. Healthy and educated citizens are among the most important factors in a country's prosperity. Those traits are entirely attainable with a healthy nutritional status, which is in large part determined by what people eat. Lifestyle, food availability, social status, and cultural norms all have a role in shaping people's dietary habits in subtler ways (Marsola et al., 2020; Hoek et al., 2021; Bonaccio et al., 2022; Enriquez et al., 2022). Poor dietary habits are a major contributor to undernourishment, which in

turn impedes national progress. Otherwise, a varied, balanced, nutritious, and risk-free diet is all that's needed to maintain a healthy body and mind. At the most fundamental level, the household level, a healthy consumption pattern can be developed (Spangenberg, J. H., & Lorek, 2019; Li et al., 2020)

Considering the main subject for domestic food availability, which is farmers' family consumption habits, is important (Olarinde, L. O., & Kuponiyi, 2005; Bahta et al., 2017). Farmers, such as those who grow coffee, can contribute to the growth of a state economically, thus it's in their best interest to



keep up a high level of output by adopting healthier habits of consumption. Exports of coffee commodities increased by 4.39 percent between 1980 and 2015, resulting in a record year for Indonesian coffee exports of 502,021 metric tons (worth US\$ 1,198 million) (Agricultural Data Center and Information System, 2020).

The Dampit District is where some of Malang Regency's best coffee is produced. Coffee plantations cover 5,392.75 hectares (ha) in Dampit Subdistrict, yielding 1.2 tons per hectare and 6,471.3 tons overall (Agricultural Extension Centre Dampit Sub-district, 2019). Among the products that the coffee business exports are ground coffee and other types of processed coffee. Due to this favorable environment, coffee products in the Dampit Sub-district have the potential to rank among the best products and raise the standard of living for coffee growers.

Dampit Sub-district coffee farmers' wellbeing does not meet the food pattern poverty threshold (HFP). As compared to other sub-districts, Dampit District has a low HFP (Malang District Food Security Agency, 2020). The value suggests that more agricultural extension education is needed to improve the Dampit Sub-district's population's which is still too limited in variety, balance, nutrition, and safety. Family, education, age, income, diversity of food sources, and frequency of eating also play a role, as do the farmers' experiences in the farming industry and their understanding of nutrition.

RESEARCH METHOD

The study was conducted at Srimulyo Village, Sukodono Village, and Amadanom Village located in the Dampit Sub-district. The study was done during January 2021-February 2021. The respondent involved in the study was coffee farmers households that has complete family members. The total respondent was 33 people consisting of 11

people for each village determined by a simple random sampling technique. The sample was used to meet the standard minimum of sample used in a study with statistical data analysis as Cohen et al. (2005) pointed out that the minimum sample for a study with statistical analysis is 30 samples. The data gathered in the study consisted of primary data, secondary data, and *food recall* 7x24 hours to seek the food consumption pattern. Further, the data were analyzed using descriptive analysis, Rank Spearman correlation, and multiple linear regression analysis.

RESULTS AND DISCUSSION

The Food Consumption Pattern of Coffee Farmers in Dampit Sub-district

The elements of food are classified into nine categories according to the food balance. The nine elements consist of cereals; starchy roots; legumes; vegetables and fruits; sugars, preserves, and syrups; meat, fish, and eggs, milk and milk products; fats and oils; beverages. The results of the consumption of these nine elements are energy and protein. The following is the table of energy (kcal /capita/day) and protein (grams/capita/day) consumption of coffee farmers.

Table 1. The food elements and the nutrition consumption

No	Food Elements	Consumption/Capita/Day						Main Energy Contributor	Food elements	1703
		Normative		Actual		Difference				
		EAR (kcal)	PAR (gram)	EAR (kcal)	PAR (gram)	EAR (kcal)	PAR (gram)			
1	Cereals	1,075	28.5	1,002.21	19.33	-72.79	-9.17	Rice and noodle		
2	Starchy roots	129	3.42	34.26	0.22	-94.74	-3.2	Chips and cassava		
3	Fats and oils	215	5.7	206.56	0	-8.44	-5.7	Palm oil		
4	Milk and milk product	64.5	1.71	27.99	0.41	-36.51	-1.3	Coconut milk and hazelnuts		
5	Sugars, preserves, and syrups	107.5	2.85	14.41	0.00	-92.59	-2.85	Granulated sugar and brown sugar		
6	Meat, fish, and eggs	258	6.84	127.15	14.60	-130.85	+7.76*	Fish and eggs		
7	Legumes	107.5	2.85	111.20	12.12	+3,7*	+9.27*	Tofu and tempeh		
8	Vegetables and Fruits	129	3.42	98.41	4.86	-30.59	+1.44*	Siamese squash and cabbage		
9	Other	-	-	21.22	1.02	-	-	Ground coffee		
Total		2,150	57	1,643.42	52.54	-506.58	-4.46			

Source: Primary data processed, 2020 and Food Security Agency, 2019

* = more than normative EAR and PAR

Table 1 presents the consumed energy/capita/day is under normative Energy Adequacy Ratio (EAR). The difference between normative Energy Adequacy Ratio (EAR) and actual reached 505.58 kcal/capita/day. The result was influenced by low consumption of some food elements such as cereals; starchy roots; vegetables and fruits; sugars, preserves, and syrups; meat, fish, and eggs, fats and oils. On the other hand, the legumes category has reached more than the needs of the national consumption standard by 3.7 kcal/capita/day. The group of starchy roots as the main energy contributor of coffee farmers' households in Dampit Subdistrict consumption is far from standard compared to the normative Energy Adequacy Ratio (EAR) of the cereal category, which is the deficit of 72.79 kcal /capita /day. The food

element that should be a concern is the meat, fish, and eggs category because it posits the largest deficit by 130.85 kcal/capita/day. Consequently, the consumption of meat, fish, and eggs category of coffee farmers should be increased to reach the actual Energy Adequacy Ratio (EAR). The results also implied the eating culture of the community prioritizes the consumption of side dishes from legumes such as tofu and tempeh.

Protein consumption from all nine food groups is close to the normative Energy Adequacy Ratio (EAR) due to a deficit of -4.46 grams/capita/day. The value showed that the consumption of protein has already at a sufficient level and is not excessive. The food group with the largest deficit of protein intake is from the cereals, while the food group with the largest surplus of protein



consumption/capita/day comes from the legumes group which is 9.27grams/capita/day. Good food consumption patterns in protein quantity are influenced by the household habits of coffee farmers in consuming processed foods from soybeans such as tofu and tempeh as the main side dishes. As in line with Tanuwijaya (2016) who asserted that soybeans are one type of legumes that have high levels of protein.

Based on the quantity aspect, consumption patterns can be divided into two, namely based on the Energy Adequacy Ratio (EAR) and Protein Adequacy Ratio (PAR) according to the Nutritional Adequacy Ratio (NAR). According to The Ministry of Health, the NAR for all age groups, gender, body size, and body activity of the Indonesian population is 2,150 Kcal /capita/day for Energy Adequacy Ratio (EAR) and 57 grams

/capita/day to meet the Protein Adequacy Ratio (PAR). These numbers are the normative Energy Adequacy Ratio (EAR) and Protein Adequacy Ratio (PAR) that each individual must achieve to meet energy and protein needs.

Coffee farmers' households spend income from their plantation activities to meet the main food needs which are rice as the main food element to fulfil calories and half the energy needs of coffee farmers. The average household energy consumption of coffee farmers in one week was 46,391.11 kcal and 6,444.76 per day and the average energy consumption was 6,444.76 kcal/day with an actual EAR 1643.42 kcal/capita/day. The actual Energy Adequacy Ratio (EAR) was less than the recommended normative 2,150 Kcal. The following table illustrates the actual EAR of coffee farmers in the Dampit Sub-district.

Table 2. Actual EAR of Coffee Farmers in Dampit Sub-district

No	Actual EAR	Normative EAR	Village			Average
			Srimulyo	Sukodono	Amadanom	
1	Average Energy/capita	2.150 Kcal/ gram/ capita/day	1,738.54	1,656.75	1534.34	1,643.42
2	EAR (%)		80.86***	77.06**	71.36**	76.44***

Source: Primary data processed, 2020

- *** = EAR > 80% normative EAR (Sufficient)
- ** = EAR < 80% normative EAR (Less)
- * = EAR < 60% normative EAR (Lack)

Based on Table 2, Srimulyo Village had the largest actual Energy Adequacy Ratio (EAR), which was 1836.94 kcal/capita/day with 80.86%, while the other two villages fell into the category of less consumption, namely Sukodono Village 1.56.75 kcal/capita/day with 77.06% and Amadanom Village 1,534.34 kcal/capita/day with 71.36%. As rice from the cereals group becomes the main source of energy, it had a direct impact on the actual Energy Adequacy Ratio (EAR) of respondents.

Sukodono Village and Amadanom Village have not yet reached the normative EAR, so the quantity of rice consumption or other food groups from food elements such as starchy roots must be increased to meet energy needs.

Consumption patterns from the next aspect of quantity can be seen as the achievement of Protein Adequacy Ratio (PAR). The main source of protein can be obtained from meat, fish, and eggs, and legumes. The



more households consume from the two main food groups, the higher the Protein Adequacy Ratio (PAR). The average protein consumption of coffee farmers households in the Dampit Sub-district was 1461.03 grams, with an average daily consumption of 208.72 grams

per household. Based on the data, the average actual Energy Protein Adequacy Ratio (PAR) /capita/day was 52.54 grams with 92.18% (sufficient category). The following table describes the actual Protein Adequacy Ratio (PAR) of coffee farmers households.

Table 3. Actual PAR of Coffee Farmers in Dampit Sub-district

No	Actual PAR	Normative PAR	Village			Average
			Srimulyo	Sukodono	Amadanom	
1	Average protein/gram	57 gram/capita/day	56.36	53.03	48.21	52.54
2	PAR (%)		98.88***	93.04***	84.58***	92.18***

Source: Primary data processed, 2020

- *** = PAR > 80% normative PAR (Sufficient)
- ** = PAR < 80% normative PAR (Less)
- * = PAR < 60% normative PAR (Lack)

Table 3 presents Srimulyo Village had the largest actual Protein Adequacy Ratio (PAR) of 56.36 grams/capita/day with 98.88% or sufficient because it has exceeded the normative Protein Adequacy Ratio (PAR) (57 grams). Otherwise, Sukodono Village and Amadanom Village also posited sufficient category with actual Protein Adequacy Ratio (PAR) 53.03 grams/capita/day with the achievement of 93.04% in Sukodono Village and 48.21 grams/capita/day with 84.58% in Amadanom Village.

In general, the food pattern score of coffee farmers in Dampit Subdistrict respondents reached 74.7 out of 100. The score showed that the consumption patterns are inadequate due to the difference from the maximum score. The score also implied that consumption in some food elements should be increased. The following is the recap of the hope food pattern score of coffee farmers in the Dampit Sub-district.

Table 4. Hope Food Pattern Score of Coffee Farmers in Dampit Sub District

No	Food Elements	Actual EAR	Actual (%)	EAR (%)	Score	Actual Score	EAR Score	Max. Score	HFP Score
1	Cereals	1,002.2	61.0	46.6	0.5	30.5	23.3	25.0	23.3
2	Starchy roots	34.3	2.1	1.6	0.5	1.0	0.8	2.5	0.8
3	Meat, fish, and eggs	127.1	7.7	5.9	2.0	15.5	11,8	24.0	11.8
4	Oils and fats product	206.6	12.6	9.6	0.5	6.3	4.8	5,0	4.8
5	Milk and milk product	28.0	1.7	1.3	0.5	0.9	0.7	1.0	0.7
6	Legumes	111.2	6.8	5.2	2.0	13.5	10.3	10.0	10.0
7	Sugars,	14.4	0.9	0.7	0.5	0.4	0.3	2.5	0.3



	preserves, and syrups								
8	Vegetables and Fruits	98.4	6.0	4.6	5.0	29.9	22.9	30.0	22.9
9	Other	21.2	1.3	1.0	0.0	0.0	0.0	0.0	0.0
Total		1,643.4	100	76.4		98.1	75	100	74.7

Source: Primary data processed, 2020

Based on Table 4, it is known that the HFP score is still below the ideal score of 100, but the legume category. The result depicted coffee farmers in Dampit Sub District preferred to consume side dishes derived from vegetable protein. Consequently, it influenced the score of meat, fish, and eggs reached a low score of 11.8 from a maximum score of 24.0, or a deficit of 12.2 points. The score obtained is a contribution from the scores of the three villages, namely Srimulyo Village, Sukodono Village, and Amadanom Village. Srimulyo Village obtained 79.3, Sukodono village obtained 71.8, and Amadanom village obtained 72.3. The three villages relatively had the same condition, namely the high score of the legume food category. Moreover, the maximum score of the legume food category was found in Sukodono Village and Amadanom Village, while the maximum score obtained in Srimulyo Village comes from the cereals category.

Accompaniment Role of Agricultural Extension Worker In An Attempt To Increase The Coffee Farmers' Food Consumption Pattern

The Malang District Food Security Agency does not have special extension personnel, to directly involve to help achieve the objectives of the agricultural program. To this end, the consumption pattern can be enhanced by improving economic levels and extension programs. The economic level can be upgraded by increasing productivity following Law No. 16 of 2016, so that coffee farmer households in Dampit District have more access to food. In addition, agriculture extension can increase knowledge about consumption patterns such as food diversity. The following table describes the accompaniment role of agricultural extension in Srimulyo Village, Sukodono Village, and Amadanom Village.

Table 5. Division of Respondents by Accompaniment Role

No	Accompaniment	Household		
		High (%)	Moderate (%)	Low (%)
1	Innovator	15.15	39.39	45.45
2	Facilitator	57.58	27.27	15.15
3	Educator	0.00	18.18	81.82
4	Coordinator	9.09	66.67	24.24
5	Analyzer	12.12	30.30	57.58
6	All roles	24.24	51.52	24.24

Source: Primary data processed, 2020



Based on Table 5, the accompaniment role posited the highest role as the role of the facilitator is quite well executed in the agricultural extension. Otherwise, the lowest result was the role of educator because counselling about ideal consumption patterns was still very lacking and uneven. Counselling on consumption patterns was significantly done by health workers, namely from the cadres of postal services so that agriculture extension did not participate directly in

counselling on consumption patterns and fulfilment of good nutrition.

The Correlation between Accompaniment Role of Agricultural Extension and Consumption Pattern

The following table illustrates the relationship between the accompaniment role and EAR of coffee farmers in the Dampit Sub District.

Table 2. Result of Accompaniment Role and Actual EAR based on Rank Spearman Correlation

		Accompaniment Role					
		Innovato r	Facilitator	Educator	Coordinator	Analyzer	All Roles
Actual EAR	<i>Correlation Coefficient Sig. (2- tailed)</i>	0.07	-0.02	0.44*	0.05	-0.04	-0.116
		0.69	0.89	0.01	0.78	0.741	0.520

Source: Primary data processed, 2020

R_s table = 0,34

** = Correlation is significant at the 0.01 level (2-tailed)

* = Correlation is significant at the 0.05 level (2-tailed)

Role as an educator has a direct impact on the actual Energy Adequacy Ratio (EAR). The result showed the relationship between the role of accompaniment of agricultural extension and actual Energy Adequacy Ratio (EAR). The result implied that the more education is given to the coffee farmers, the higher the Energy Adequacy Ratio (EAR) is. According to Azhari et al. (2013), formal education does not significantly change the knowledge, attitudes, and skills, thus those

aspects can be improved by the government through non-formal education such as extension activities.

The further analysis is focused on analyzing the correlation between the accompaniment role with the achievement of Protein Adequacy Ratio (PAR) of coffee farmers in the Dampit Sub District. The following table presents the result of Rank Spearman Correlation.



Table 7. Result of Accompaniment Role and Actual PAR based on Rank Spearman Correlation

		Accompaniment Role					
		Innovato r	Facilitato r	Educator	Coordinator	Analyzer	All Roles
Actual PAR	<i>Correlatio n Coefficien t</i>	0.15	-0.14	0.28	0.17	0.03	-0.29
	<i>Sig. (2- tailed)</i>	0.39	0.45	0.11	0.35	0.86	0.09

Source: Primary data processed, 2020

R_s table = 0,34

** = Correlation is significant at the 0.01 level (2-tailed)

* = Correlation is significant at the 0.05 level (2-tailed)

The results revealed no relationship between the level of accompaniment role of agricultural extension and the actual Protein Adequacy Ratio (PAR) of coffee farmers' households in the Dampit Subdistrict. It happened because the r_s is smaller than the table r_{s-} (0.34) and significant values are more than $\alpha = 0.05$ and $\alpha = 0.01$ with a coefficient value of -0.29 or with a very low relationship level and are positively related. Further, the result could be partly explained that uneven counselling about food consumption patterns did not change the eating culture of the community in consuming side dishes. Consequently, the majority of coffee farmer households still make tofu and tempeh from the bean food group as the main side dish.

CONCLUSION AND SUGGESTION

Reflecting upon the results of the study, some conclusions can be made toward the consumption pattern of coffee farmers in the Dampit Sub-district. Based on the quantity aspect, the pattern of food consumption of coffee farmers in the Dampit Sub-district has not been achieved because the average energy consumption of respondents only reached 1,643.42 kcal/capita/day. However,

the protein consumption of coffee farmers' households in the Dampit Sub-district is relatively sufficient with an average consumption of protein of 52.54 grams/capita/day. Further, based on the quality aspect, the quality of consumption pattern of the coffee farmers has not been achieved as it reached 74.7 out of 100. The score was influenced by the lack percentage of consuming meat, fish, and eggs food category and starchy roots food category.

The role of accompaniment role in agricultural extension to improve Energy Adequacy Ratio (EAR) and Protein Adequacy Ratio (PAR) is low. It happens because counselling on consumption patterns and food diversity is still uneven. Counselling on consumption patterns and nutritional adequacy is more widely conveyed by health workers from the health service in integrated service post activities. There is no significant relationship between the role of accompaniment role and EAR, except for the educator role with a significance value of $\alpha = 0.01$ (Coefficient correlation = 0.44). Moreover, there is no relationship between the role of assistance of agricultural extension and the actual Energy Adequacy Ratio (EAR) due to counselling about consumption



patterns that are less evenly distributed so that the culture of public consumption has not changed. In addition, the same result also revealed that no significant relationship between the role of accompaniment of agricultural extension and the actual Protein Adequacy Rate (PAR) of respondents. The largest correlation coefficient is in the role of mentoring as an educator, which is 0.285. Moreover, factors that influence the actual EAR of coffee farmer households are the number of family members, spending on food, and frequency of eating, while the factors that affect the actual Protein Adequacy Ratio (PAR) of coffee farmer households are the number of family members and farm business experience.

Based on the result of the study, it is recommended that respondents need to diversify the food consumption and increase the quantity of the consumption, especially from meat, fish, and eggs food category and starchy roots food category. The variety and balanced consumption carried out by coffee farmers will be able to increase consumption patterns from the aspect of quantity and quality. Besides, there is a need for counselling given by agricultural extension about diverse and balanced consumption patterns for coffee farmer households in the Dampit Sub-district to change the food consumption habits.

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