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SINTA 2

Food Security Analysis of Melon Farmer Households During the Covid-19 Pandemic in Tuban Regency

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ABSTRACT

The impact of the coronavirus entering Indonesia is felt by various parties, including farmer households. In addition to the obligation of farmers to supply food for the entire community, they are also pressured to pay attention to the nutritional intake of their households. High-nutrition food is needed during the COVID-19 pandemic to maintain immunity, but it is difficult to fulfill during the pandemic due to the increasing prices of food. If production and sales of agricultural products decrease, the ability of households to consume food that is suitable in quantity and quality will also decrease. However, the agricultural sector in Indonesia shows positive growth. This study aimed to determine the household food security of melon farmers based on 1) food quantity, from EAR and PAR results, and 2) food quality, from Desirable Dietary Pattern scores. Determination of the research location purposively. Food consumption data were obtained from food recall. The results of the analysis based on the quantity aspect showed that the average actual energy consumption was 1,854.78 kcal/capita/day (88.3%), while protein consumption was 68.47 grams/capita/day (120.1%). The results of the analysis of the quality of food consumption are 81.5, it can be seen that the household food consumption of melon farmers from the aspect of quantity and quality has not been achieved.

Keywords: Farmer household food security, food quantity, food quality

INTRODUCTION

The COVID-19 pandemic has triggered household food security issues and the well-being of the community. The COVID-19 pandemic is a global health problem that has caused a major economic shock resulting in short-term disruptions in the agricultural food system with potential long-term effects that are of great concern (Martey, Goldsmith, and Etwire, 2022). FAO (2020) also observes several ways in which the global pandemic will affect access to food, food security, and nutrition.

The impact of the pandemic on food security starts at the level of farmers because the effects at the farmer level are expected to spread throughout the agri-food chain, such as market access, logistics, and food processing due to disruptions caused by transportation, lockdown restrictions, and borders (Nchanji and Lutomia, 2021). The end result of these effects is felt at the household level, including loss of income, limited or unstable access to food, food insecurity, and poverty (Nchanji and Lutomia, 2021).

Therefore, from various uncertain conditions during the COVID-19 pandemic, it is feared that it could affect the demand for melons. Where if the demand for melons decreases, the household income of farmers also decreases. Thus, it will also affect food expenditure and household

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food security of melon farmers. Therefore, although Tuban Regency has many superior resources and potential, this cannot guarantee that all people can be free from poverty and food insecurity status. In addition, in 2020, food consumption for the population of Tuban Regency is still below the average Indonesian energy and protein adequacy rate (2,100 kcal/capita/day and 57 grams/capita/day), which is 1,788 kcal/capita/day and EAR of 53, 4 grams/capita/day (Tuban regency goverment, 2021).

Vulnerable groups including landless laborers, wage earners, and small-scale farmers have been obstructed from their day-to-day work and faced the worst hit among all (Workie, at al, 2020). As of now, food accessibility will be severely affected followed by its availability compared to other food security dimensions. In the long term or post-pandemic, food availability could be harshly impacted if no actions have been taken by the concerned (Workie, at al, 2020).

The area chosen to be the research location is Klotok Village, the village is an area that has the highest melon production in Tuban Regency. By looking at the potential for high productivity, it is possible to increase income for melon farmers. With increasing melon production, the income of melon farmers will also increase. The increase or decrease in the income of melon farmers can also affect the purchasing power of farmer households in meeting the needs of diverse and nutritional food consumption. Although the agricultural sector and the horticulture sub-sector have shown positive growth, this has not been enough to guarantee food security at the household level for melon farmers. Therefore, this study was conducted regarding the analysis of household food security of melon farmers in Klotok Village, Plumpang District, Tuban Regency based on aspects of quantity and quality of food consumption. The analysis is carried out on the smallest unit of food security, the household level. By analyzing household resilience, it is hoped that it can describe food security both at the household level and at the national level. Farmer household food security can be identified by looking at household consumption patterns from both quantity and quality aspects. Where this can be used to obtain input related to efforts to improve the food security of farmer households in the research area.

METHODS

This research was conducted using a quantitative approach. Questionnaires are used to assist the data gathering process, and survey techniques are used to gain an overview of the research site. With the information that the site has the maximum melon production in Tuban Regency, Klotok Village in Plumpang District was selected. The determination of respondents begins with determining the population of melon farmer households that are members of the Melon Farmers Association of Klotok Village "Sumber Buah" which amounts to 515 farmers. Where the entire population used is melon farmer households that have met the criteria for the Minimum Limit for Melon Farming (Basic Management Unit = 100 m2). Based on BPS, (2003) a household can be categorized as a horticultural farmer's household if there are many trees/clumps/areas of horticultural crops cultivated by the household, which is greater than or equal to the minimum business limit (BMU). The probability sampling method was used, where all melon farmer households had the same opportunity to be the sample in the study. Slovin's formula was used to calculate the minimum number of samples (equation 1) (Riyanto and Hatmawan, 2020):

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

$$n = \frac{515}{1+515(0,15)^2}$$

$$n = 41$$

As for the method of taking respondents in this study using the cluster random sampling method, in this method the sample will be taken randomly and evenly in the same groups based on the

criteria (BMU = 100 m2) and the division of the village area consisting of four hamlets, namely Klotok, Dolok, Lingit, and Landean Hamlet. According to Myers and Hansen (2011) in Fajrin and Tino (2019), the cluster random sampling method is a method of taking samples from groups/clusters from which individual samples are drawn from the selected cluster. Data on household food consumption was obtained using the food recall method for 2x24 hours, and in the data collection and analysis process using a questionnaire and the application of the 2007 NutriSurvey. The 24-hour food recall method is a method that focuses on the ability to remember all foods and beverages consumed by the household. been consumed by research respondents for 24 hours (Sirajuddin et. al. 2018). After the food consumption data is recorded in the Household Size, the data held will be converted into a measure of weight (grams) (Sirajuddin et. al. 2014). After the amount of food consumed is known by weight, it is continued by tabulating and classifying the types of household food consumption into nine food groups. Then the type of food consumption will be converted based on the nutrient content by using the guidelines for the List of Food Ingredients or the Indonesian Food Composition Table, and to simplify the conversion process, an application in the form of the Nutri Survey 2007 is used. The next step is to determine the condition of resilience. Melon farmer's household food is by analyzing the nutritional adequacy level of the respondents by using the Nutrient Adequacy Ratio approach (Energy Adequacy Rate and Protein Adequacy Rate).

Energy Adequacy Rate and Protein Adequacy Rate analysis

The following is the formula for determining household nutritional adequacy rates based on EAR and PAR (Hamid et. al., 2013):

$$Eji = [Bj \times KEj/100 \times (BDDj/100)] / JRT \quad (2)$$

$$Pji = [Bj \times KPj/100 \times (BDDj/100)] / JRT \quad (3)$$

Information:

Eji : Energy consumed from food j from household to i
Pji : Protein consumed from food j from household to i
Bj : Food weight j (grams)
KEj : The content of energy per 100 grams of the food
KPj : The content of protein per 100 grams of the food
BDDj : Percentage of food j eaten (%BDD)
JRT : Number of household members
j : Foodstuffs
i : Household to i

Calculation of total energy and protein in each food group:

$$Epi: \sum m\ j = 1\ Ejp \quad (4)$$

$$Ppi: \sum m\ j = 1\ Pjp \quad (5)$$

Information:

Epi : Total actual energy in food group p from household to i
Ppi : Actual total protein in food group p from household to i
Ejp : Energy from food j belonging to the food group p
Pjp : Protein from foodstuff j belonging to the food group p
j : Foodstuffs
p : food group

Calculation of total energy and protein in all food groups:

$$TEi = \sum 9\ p = 1\ EP \quad (6)$$

$$TPi = \sum 9\ p = 1\ Pp \quad (7)$$

Information:

TEi : Total actual energy of all food groups from household to i
TPi : Actual total protein of all food groups from household to i
Epi : Total actual energy in food group from household to i
Ppi : Actual total protein in food group from household to i
P : food group

Analysis of %EAR and %PAR

The level of energy consumption and the level of protein consumption can be determined using the following formula (Perdana and Hardinsyah 2013 in Arida et al. 2015):

$$\%\text{EAR} = \frac{\sum \text{energy intake}}{\sum \text{EAR actual of each food group}} \times 100\% \quad (8)$$

$$\%\text{PAR} = \frac{\sum \text{protein intake}}{\sum \text{PAR actual of each food group}} \times 100\% \quad (9)$$

Information:

%EAR : Energy Consumption Rate (%)/ actual energy percentage of each food group to EAR

%PAR: Protein Consumption Rate (%)/ actual protein percentage from each food group to PAR

Desirable dietary pattern Analysis

The first step in calculating the Desirable dietary pattern (DDP) score is to calculate the percentage of energy and percentage of protein (%EAR and %PAR). Then, calculating the actual DDP score for each food group, it can be done in the following way:

Food group DDP score = %EAR x DDPp weight (10)

Information:

%EAR : Percentage of the energy content of each food group

DDPp weight : The weight of the food group p that has been assigned a weight for each food group.

There is the condition, If the actual DDP score is higher than the normative DDP score (maximum), then the score used is the normative DDP score and If the actual DDP score is lower than the normative (maximum) score, then the actual DDP score is used. Actual total DDP calculation is obtained by adding up all DDP scores in each food group (BKP Ministry of agriculture, 2015).

Actual DDP Score = ∑ The resulting criterion value

RESULTS AND DISCUSSION

Characteristic Respondents

The average age of the household head and mother of the respondents is around 43 years old and 39 years old, respectively. These ages fall under the category of adult or productive age, which is between 15-64 years old. The consumption of balanced and diverse nutritious food in this age range can be disrupted due to several factors such as busy working schedules, mothers working outside the home, and lack of knowledge about proper nutrition. According to the Regulation of the Minister of Health of the Republic of Indonesia Number 41 of 2014, the disruption of nutrition fulfillment in adulthood is caused by strict working hours, short time at home, increased risk of exposure to pollution and unsafe food, mothers working outside the home, consumption of fast food, and lack of knowledge about nutrition. Therefore, the age level of both the household head and mother is important, as they are the leaders in the household who determine and make decisions about fulfilling the nutritional needs of the household and the consumption patterns of each household member.

The formal education level of household heads and housewives is very important as it can affect the quantity and quality of the food consumed by family members. This is in line with the findings of Ngaisyah (2017), which states that the higher the education level of an individual, the higher their knowledge and information about nutrition and food. The majority of household heads have completed their education up to elementary school level (41%), while the majority of housewives have completed their education up to high school level (34%). In addition, the average number of household members among the research respondents is around 4 people

The number of household members has a significant impact on the adequacy of nutrition and dietary diversity. In calculating the total actual energy and protein, the number of family members who eat will affect the average distribution of the total energy and protein. Therefore, it is important to pay attention to fulfilling the consumption of food for each family member to meet their nutritional needs and food variety. Argandi (2019) revealed that households with fewer members tend to be more economically and nutritionally prosperous due to more even food

distribution. Conversely, a large number of members can affect the pattern of food consumption, nutritional status, and the score of dietary diversity (PPH).

Respondents in the study reported an average melon production of 10,743 kg, with an average price of Rp 6,527 per kilogram at the farm level. According to Rahmawati et al. (2020), agricultural production is a determinant of farmers' income that will affect their behavior in achieving food security. Therefore, higher production yields can increase farmers' income, which in turn indirectly affects their households' purchasing power to buy nutritious and diverse food

Quantity Analysis of Respondents' Food Consumption Patterns

The quantity of food is analyzed by examining the Nutrition Adequacy Ratio (NAR), which includes the Protein Adequacy Rate and Energy Adequacy Rate. Table 1 shows that the average actual total energy consumption of melon farmer households in Klotok Village is 1,854.78 kcal/capita/day, which is still below the recommended Energy Adequacy Rate of 2,100 kcal/capita/day. The insufficient energy consumption in melon farmer households is caused by the lack of energy consumption in each food group. Out of the nine food groups, seven have not met the recommended Energy Adequacy Rate, namely the food groups of grains, tubers, Animal-derived foods, oils and fats, sugar, vegetables, and fruit, as well as other food groups. Meanwhile, the fruit and oily seeds food group and the legume food group have met the recommended EAR.

Table 1.
Energy Consumption by Food Group

No.	Food Group	Energy Consumption (kcal/capita/day)			
		EAR Actual	EAR Normative	GAP	GAP (%)
1.	Grains	958,61	1050	+91,39	+0,91
2.	Tubers	58,32	126	+67,68	+0,46
3.	Animal-derived food	195,59	252	+56,41	+0,78
4.	Oil and Fat	190,86	210	+19,14	+0,91
5.	Oily Fruit and Seeds	83,89	63	-20,89	-1,33
6.	Nuts	153,48	105	-48,48	-1,46
7.	Sugar	62,69	105	+42,31	+0,60
8.	Vegetable and Fruit	90,94	126	+35,06	+0,72
9.	Etc	60,40	63	+2,60	+0,96
Total		1.854,78	2.100	+245,22	

Source: Primary data, 2021 (processed)

The high consumption of oily fruits and seeds, as well as the legume food group, is due to the respondents' eating patterns or habits. They often consume foodstuffs such as coconut/coconut milk, tofu, tempeh, and long beans for their daily menu. In addition to having become a habitual eating pattern, these ingredients also have a fairly affordable price and are easily obtained around the research area. The quantity of household food can also be determined by the value of protein consumption, as shown in Table 2 regarding the respondents' protein consumption by food group.

The average total actual protein consumption in melon farmer households in Klotok Village is 68.47 grams/capita/day. This value is sufficient for the recommended protein consumption for the Indonesian people, which is 57 grams/capita/day. Although the actual average total protein consumption in melon farming households is quite high, some food groups still have insufficient protein consumption. These groups are grains, tubers, fruit and oily seeds, and vegetables and fruit. Meanwhile, the actual consumption of protein that has fulfilled the recommended PAR is in the Animal-

derived food group, the legume food group, the sugar food group, and other food groups, which include various ingredients such as spices. Based on the analysis results, it can be seen that the average actual protein consumption has exceeded the normative value of 68.47 grams/capita/day. However, the distribution of protein consumption in the nine food groups is unbalanced since many food groups still consume protein below the normative value.

Table 2.
Protein Consumption Based on Respondent's Food Group

No.	Food Group	Protein Consumption (grams/cap/day)			
		PAR Actual	PAR Normative	GAP	GAP (%)
1.	Grains	25,55	27,82	+2,27	+0,92
2.	Tubers	0,66	4,65	+3,99	+0,14
3.	Animal-derived food	21,59	1,95	-19,64	-11,07
4.	Oil and Fat	0	0	0	0,00
5.	Oily Fruit and Seeds	1,13	6,62	+5,49	+0,17
6.	Nuts	14,76	12,84	-1,92	-1,15
7.	Sugar	0,02	0	-0,02	-0,00
8.	Vegetable and Fruit	2,27	3,12	+0,85	+0,73
9.	Etc	2,49	0	-2,49	-0,00
Total		68,47	57	-11,47	

Source: Primary data, 2021 (processed)

The high consumption of Animal-derived foods in Tuban Regency may be attributed to its location as a coastal area on the North Sea of East Java, where there is an abundant supply of marine fish. This makes it easier for the local community to meet their fish consumption needs. According to the East Java Regional Development Planning Agency (2013), Tuban Regency has a marine area of 65 KM, which makes it possible for the production of marine fish to exceed the needs of the community. On the other hand, the high consumption of nuts is due to the eating habits of the respondents who enjoy consuming foodstuffs such as tofu, tempeh, and long beans. These foodstuffs are affordable and easily accessible in Klotok Village, where some people also grow long beans on their agricultural land. Rejekiningrum (2014) reported that the largest potential area for soybean development in East Java is in Tuban and Lamongan Regencies, with a total area of 203,624 Ha. Therefore, with the abundance of resources such as soybeans, it is possible for the community to meet the energy and protein needs of the legume food group.

The average energy consumption of the households of respondents from each food group has not yet reached the recommended level. This can be seen from the percentage of Energy Adequacy Rate (%EAR) to total actual energy (Actual EAR), which is still below the Normative %EAR of 88.3%. However, there are food groups that have achieved %EAR to total actual energy that is sufficient for the Normative %EAR, namely the fruit and oily seed food group at 4.0% and the nut food group at 7.3%.

The protein consumption of respondents in Klotok Village has reached the normative PAR of 120.1%. Three food groups have reached normative PAR: the Animal-derived food group by 37%, the legume food group by 25.9%, and other groups consisting of ingredients such as spices by 4.4%. The high consumption of protein in the Animal-derived food group and nuts is due to the fact that the households consume a lot of foodstuffs such as eggs, tuna, boiled fish, tofu, and tempeh, which have high protein content. Moreover, the increase in animal protein consumption, especially foodstuffs in the form of marine fish, and public awareness of nutritional adequacy and health are

some factors contributing to the high protein consumption in the community of Tuban Regency. According to the Tuban District Fisheries and Livestock Service (2020), the consumption of animal protein has increased from 3.42 kg/capita/year in 2018 to 3.58 kg/capita/year in 2020.

Quality Analysis of Respondents' Food Consumption Patterns

The quality of household food consumption of melon farmers in Klotok Village can be assessed through the DDP score (Pola Pangan Harapan), which indicates the value of the diversity of household food consumption based on the nine food groups. The actual DDP score of farmer households in Klotok Village is still below the normative DDP score of 81.5%. Only the oily fruit and seed food group (2.0%) and nuts (14.6%) have met the normative DDP score, but this cannot confirm that the quality of respondents' food consumption is diverse and nutritionally balanced. This is because the EAR scores obtained from other food groups still fall below the recommended DDP figures (normative DDP).

Table 3.
Percentage of Energy Consumption to Total Actual Energy, Total Normative EAR, and % RDA

No.	Food Group	Energy Consumption Percentage		
		To Total Actual Energy	To Total Normative Energy (EAR)	%AKG
1.	Grains	51,7	45,6	50
2.	Tubers	3,1	2,8	6
3.	Animal-derived food	10,5	9,3	12
4.	Oil and Fat	10,3	9,1	10
5.	Oily Fruit and Seeds	4,5	4,0	3
6.	Nuts	8,3	7,3	5
7.	Sugar	3,4	3,0	5
8.	Vegetable and Fruit	4,9	4,3	6
9.	Etc	3,3	2,9	3
Total		100,0	88,3	100

Source: Primary data, 2021 (processed)

Table 4.
Percentage of Respondent Household Protein Consumption of Total Actual, PAR, and Normative Protein

No	Food Group	Protein Consumption Percentage		
		To Total Actual Protein	To Total Normative Protein (PAR)	%AKG
1.	Grains	37,3	44,8	48,8
2.	Tubers	1,0	1,2	8,15
3.	Animal-derived food	31,5	37,9	3,42
4.	Oil and Fat	0,0	0,0	0
5.	Oily Fruit and Seeds	1,7	2,0	11,62
6.	Nuts	21,6	25,9	22,53
7.	Sugar	0,0	0,0	0
8.	Vegetable and Fruit	3,3	4,0	5,48
9.	Etc	3,6	4,4	0
Total		100,0	120,1	100

Source: Primary data, 2021 (processed)

Table 5.
Percentage of Energy Consumption and Desirable dietary pattern Score

Food Group	Weight	%EAR Actual	Score EAR	Score DDP Normative	Score DDP Actual
Grains	0,5	45,6	22,8	25	22,8
Tubers	0,5	2,8	1,4	2,5	1,4
Animal-derived food	2	9,3	18,6	24	18,6
Oil and Fat	0,5	9,1	4,5	5	4,5
Oily Fruit and Seeds	0,5	4,0	2,0	1	1
Nuts	2	7,3	14,6	10	10
Sugar	0,5	3,0	1,5	2,5	1,5
Vegetable and Fruit	5	4,3	21,7	30	21,7
Etc	0	2,9	0,0	0	0,0
Total		88,3	87,1	100,0	81,5

Source: Primary data, 2021

The lack of achievement in the quality of food consumption for each food group may be due to various factors such as a lack of knowledge among households on how to meet diverse and balanced nutritional needs, limited purchasing power, eating habits, and the number of family members who consume food. Although the normative DDP score has not been achieved, some food groups such as grains, Animal-derived foods, vegetables, and fruits have contributed to a relatively high DDP score. The consumption of grain food group is dominated by rice, while for the Animal-derived food group, respondents tend to consume foodstuffs such as chicken eggs and sea fish. Regarding the consumption of vegetables and fruit in the households of respondents, they tend to consume spinach, vegetable soup, young papaya, bananas, oranges, and mangoes.

Position of PAR, EAR, and DDP compared to National and East Java Conditions

Table 6 shows the protein adequacy rate (PAR), energy adequacy rate (EAR), and Desirable dietary pattern (DDP) score at the National, East Java, and household levels. The DDP score of melon farmer households is still below the National DDP score, East Java DDP score, and normative DDP score of 100, with a score of 81.5. This indicates that the quality of food consumption in these households is not diverse. Similarly, the %EAR in these households is still below the National %EAR value, East Java %EAR value, and normative EAR value (100%), which is 88.

The energy needs recommended for farmer households are not being met, and the food consumption is not diverse, as indicated by the %EAR and normative DDP scores of many food groups. Household characteristics, such as the age of the head of the household and housewife, education level, land area, production, selling price, length of farming, and number of family members, can influence the selection of food consumption patterns and the adequacy of food consumption for each household member. On the other hand, protein consumption in melon farmer households tends to be high, exceeding the recommended % RPA (100%) of 120%. This high consumption of protein is due to the grain food group (44.8 grams/capita/day), the Animal-derived food group (37.9 grams/capita/day), and the legume food group (25.9 grams/capita/day), which have high protein content

Table 6.
Position of PAR, EAR, and DDP at the National, East Jav,a and Household levels

Food Group	National (%) 2020[1]			East Java (%) 2020[1]			Melon Farmer Household (%) 2021[2]		
	PAR	EAR	DDP	PAR	EAR	DDP	PAR	EAR	DDP
1	29,07	60,3	25,0	48	57,8	25	44,8	45,6	22,8
2	0,46	2,3	1,2	1	2,4	1,2	1,2	2,8	1,4
3	21,29	11,6	23,2	32	10,3	20,6	37,9	9,3	18,6
4	0,03	11,9	5,0	0	12,0	5	0,0	9,1	4,5
5	0,27	1,0	0,5	1	1,1	0,6	2,0	4,0	1
6	5,47	2,7	5,3	14	3,8	7,6	25,9	7,3	10
7	0,10	3,6	1,8	0	4,0	2,0	0,0	3,0	1,5
8	3,81	4,9	24,4	7	5,0	25,0	4,0	4,3	21,7
9	1,56	2,4	0,0	3	2,6	0,0	4,4	2,9	0
Total	108,87	100,6	86,3	106	99,1	87,0	120,1	88,3	81,5

Source: Food Security Agency of the Ministry of Agriculture, 2021[1], Primary data, 2021[2]

Melon Farmer Household Food Quantity and Quality Condition

Table 7 presents the results of the analysis on the quantity and quality of food consumed by melon farmer households in Klotok Village. Based on the average EAR and %EAR scores, it is evident that food consumption in the respondents' households is still below the normative values of 1854.78 kcal/capita/day and 88.3%, respectively. This indicates that the households have not achieved the nutritional adequacy rate, and the average energy consumption from each food group is not sufficient. Therefore, it can be concluded that, in terms of quantity, the food consumption of melon farmers in Klotok Village has not reached the recommended RDA value of 2,100 kcal/capita/day.

On the other hand, the quality of food consumption, as measured by the DDP score, is also low at 81.5%, which is below the normative DDP. The recommended DDP score was not achieved because the actual energy consumption of most food groups fell below the normative DDP score, except for the oily fruit and seed and legume food groups.

Tabel 7.
Average Results of EAR and DDP in Klotok Village

Food Group	Actual EAR	% Actual EAR	EAR score	Actual DDP Score
1	958,61	45,6	22,8	22,8
2	58,32	2,8	1,4	1,4
3	195,59	9,3	18,6	18,6
4	190,86	9,1	4,5	4,5
5	83,89	4,0	2,0	1
6	153,48	7,3	14,6	10
7	62,69	3,0	1,5	1,5
8	90,94	4,3	21,7	21,7
9	60,40	2,9	0	0
Total	1854,78	88,3	87,1	81,5

Source: Primary data, 2021

Based on the BKP of the Ministry of Agriculture, (2019), the diversity of food consumption can be achieved if there has been a proportion of the energy balance of the nine food groups, which aims to meet nutritional needs both in terms of quantity and quality/quality of food. The analysis reveals that household food consumption of melon farmers falls short of recommended levels both in terms of quantity and quality, as indicated by the Energy Adequacy Rate and the Desirable

dietary pattern. The lack of variety in food consumption can be attributed to the fact that the energy balance of the nine food groups, which is essential to meeting nutritional needs, has not been achieved. Furthermore, the inadequate quantity and quality of food can also be traced to the allocation of income from melon farming, which is often diverted to non-food expenses. The COVID-19 pandemic has further exacerbated this situation, as household spending that should have been used for food consumption is now being diverted to buy items such as masks, hand sanitizer, and internet data packages for educational activities.

Food Consumption Patterns Before the Pandemic and During the Pandemic

The pattern of food consumption before the pandemic and during the pandemic aims to describe the condition of food security at the household level based on the pattern of food consumption. Table 8 presents the food consumption patterns before and during the COVID-19 pandemic in melon farmer households in Klotok Village and the Tuban Regency area, aiming to describe the household food security condition.

In Table 8, it is shown that the quantity and quality of food in households in the Tuban district have not been able to reach the normative figures of the EAR and normative scores of DDP. When the table is viewed, it can be observed that the quantity and quality of household food consumption tend to decrease. Before the COVID-19 pandemic in 2019, the quantity and quality of household food consumption in Tuban Regency were at 87.6% and the DDP score reached 84.25. Then, on March 2, 2020, it was confirmed that the COVID-19 pandemic had entered Indonesian territory. The entry of the COVID-19 pandemic into Indonesia indirectly affected the quantity and quality of food in the early days of the pandemic. This could be caused by large-scale social restrictions (PSBB), as well as changes in economic dynamics in the community. Due to changes in dynamics in various sectors, especially in the economic sector, people experienced a decrease in income and purchasing power. These changes could also affect the income and expenditure of melon farmers' households due to a decrease in demand because of a decrease in people's purchasing power. Therefore, these conditions could reduce the ability of melon farmer households to meet the needs of nutritionally balanced and diverse food consumption.

Table 8.
Consumption Patterns Before and During the COVID-19 Pandemic

Food Group	Tuban 2019 (%)[1]		Tuban 2020 (%)[1]		Melon Farmer Household, 2021 (%)[2]	
	EAR	DDP	EAR	DDP	EAR	DDP
1	45,1	22,6	46,2	23,1	45,6	22,8
2	3,2	1,6	2,3	1,2	2,8	1,4
3	10,6	21,2	9,8	19,6	9,3	18,6
4	11,3	5,0	10,5	5,0	9,1	4,5
5	2,0	1,0	2,1	1,0	4,0	1,0
6	8,2	10,0	7,8	10,0	7,3	10.0
7	2,8	1,4	1,7	0,8	3,0	1,5
8	4,3	21,4	4,3	21,6	4,3	21,7
9	0,0	0,0	0,4	0,0	2,9	0,0
Total	87,6	84,2	85,1	82,4	88,3	81,5

Source: DPKP Tuban Regency, 2020[1], Primary data, 2021[2]

In 2020, the quantity and quality of food decreased compared to 2019, where the acquisition of %EAR and the acquisition of DDP scores reduced to 85.1% and 82.4%, respectively. However, in 2021, there was an increase in the percentage of energy adequacy rate (%EAR) in melon farmer households

compared to 2019 before the pandemic and 2020 during the pandemic. The increase in energy consumption in the second year of the pandemic may be due to increased awareness among the public to consume nutritious food to boost immunity during the COVID-19 pandemic. Moreover, the government's latest policy, the New Normal, has indirectly influenced the increase in energy consumption in melon farmer households in 2021, as people can now carry out activities as before but with strict health protocols. Consequently, food distribution and community activities outside the home, especially to meet the need for food, can run normally.

Furthermore, the food quality of melon farmer households in 2021 tends to decrease compared to the DDP score in 2019 and 2020 in the Tuban Regency area. The food groups that experienced a decrease in DDP scores in 2021 were the grain food group (22.8), the animal-derived food group (18.6), and the oil and fat food group (4.5). This decrease in the DDP score could be due to many food groups still being below the normative DDP score, and a lack of household knowledge about the importance of diverse nutritional needs in terms of quantity and quality of food. During the COVID-19 pandemic, consumption of nutritious and diverse foods is crucial to boost immunity, especially vegetables and fruits, and tubers that contain essential vitamins and energy. Utami et al. (2021) suggests that people should consume more vegetables and fruits as they help to increase body immunity. Therefore, it is vital for households, especially melon farmer households, to be aware of the adequate and varied nutritional needs of each household member. Fulfilling good quantity and quality of food not only helps to increase immunity during the COVID-19 pandemic but also indirectly affects the quality of human resources, supported by good health and nutritional quality.

CONCLUSION

The conclusions that can be drawn from this study are as follows: 1) with regard to quantity, both energy and protein consumption have not reached the normative levels and need to be increased. Meanwhile, excessive energy and protein consumption should be adjusted to the recommended levels to prevent waste and ensure balanced intake. 2) In terms of food quality or diversity, some food groups are still below the normative level and need to be added, while others exceed the normative level and should be reduced to meet the DDP standard (Hopeful Food Plan). To improve the food condition of melon farmers' households, access to information about nutritional adequacy and food diversity should be increased through socialization efforts utilizing organizations such as PKK and RT associations.

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