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The Changes of Household Food Expense During COVID-19 Pandemic: A Case Study in Indonesia and Armenia

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Abstract

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The Covid-19 pandemic has had an impact on the availability and distribution of food, but its impact on food consumption at the household level was not much known. The aim of the research was to analyze changes in food expense during the Covid-19 pandemic of cases in Indonesia and Armenia. Indonesian case used primary data in April-May 2020, at the beginning of the pandemic. Data were analyzed descriptively and paired t statistic test. The results showed that there was a change in consumption during the pandemic. The significant changes were an increase in the amount of rice consumption, an increase in food expense, and a decrease in the purchase of cooked meal. Snack purchases during the pandemic increased but not significantly. The Armenia case used secondary data from FAO. Regarding the COVID-19 pandemic, as well as the post-war crisis in the Republic of Armenia, it has had a negative impact on transportation, storage, sales, financial situation, access, and availability of agricultural products and labor markets. Thus, digital solutions for agricultural marketing, that is Digital Agriculture Marketplace Platform have been adopted. The conclusion was that the impact of the pandemic actually increased consumption needs. The recommendation that given was the support for food logistics transportation which very much needed in the pandemic era and more specifically supported by food distribution security.

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INTRODUCTION

The COVID-19 pandemic has had a major impact on various aspects of life. Starting with health problems, the COVID-19 pandemic has had a double effect on the economic, business, transportation and logistics, and tourism sectors. At the household micro scale, the pandemic has had an impact on the degression in people's purchasing power and changes in the behavior and mobility of family members. More specifically, the pandemic has impacted on food demand (Cranfield, 2020). In anticipation of this extraneous event, the government had also set a strategy for the agricultural sector to ensure the availability of staple foods (Rusdiana & Talib, 2020). However, during the pandemic, food prices also tended to be unstable (Saliem, Agustian, & Perdana, 2020), of course this had an impact on food expense and food consumption patterns.

Another factor was that the COVID-19 pandemic had also greatly impacted the economy. Various layoffs (PHK) have been occurred. This economic situation had an impact on the household economy, especially those who were directly affected by the stuck activities of Small and Medium Enterprises (UKM) and layoffs. The household economy that affected by the pandemic will have an impact on expense, including food consumption purchase (Sina, 2020). In aggregate, the COVID-19 pandemic will affect market demand for food products (Cranfield, 2020). In fact, food expense was one of the indicators of food security (Ilham & Sinaga, Bonar M.Zhu, 2007).

The pandemic had an impact on the changes in consumption patterns (Chenarides, Grebitus, Lusk, & Printezis, 2021; Eftimov, Popovski, Petković, Seljak, & Kocev, 2020; Hirvonen, De Brauw, & Abate, 2020). Although the results of other studies showed that during the pandemic there was no change in drinking habits such as coffee, tea and water (Husain & Ashkanani, 2020). The basic reason for changing consumption patterns was the issue and belief in food safety (Chenarides et al., 2021; Olaimat, Shahbaz, Fatima, Munir, & Holley, 2020). People were also trying to adopt a healthy lifestyle during the COVID-19 pandemic, including by consuming healthy foods (Reyes-Olavarria et al., 2020). For example, research result showed that consumer preferences were shifting from the main choice of meat and bakery to fruit and vegetables for healthier reasons (Celik & Dane, 2020). In addition, another consideration was trust in cooking procedures that ensure food safety (Olaimat et al., 2020).

In accordance with changes in consumption patterns, people have also responded to the pandemic by changing household expense patterns, which were increasing in certain needs and decreasing in other needs (Baker, Farrokhnia, Meyer, Pagel, & Yannelis, 2020). The health expense of the Indonesian during the pandemic had increased and more had to be borne by the people themselves (Yusa, 2021).

As a result of more family members staying at home, it has increased the stock of food needs and the amount of shopping with the intention to meet the adequacy of the family members nutritional intake (Amicarelli & Bux, 2021). Similarly, the implementation of Large-Scale Social Restrictions in several regions potentially to cause the delay in food supply chain, especially in areas that have transportation barriers (Masniadi, Angkasa, Karmeli, & Esabella, 2020).

Various previous studies have examined the impact of the COVID-10 pandemic on consumption patterns and changes in household needs. However, in Indonesia there was no important information about changes in food consumption expense at the household scale. That information was important in providing information about household survival during the COVID-19 pandemic. A more difficult situation occurred in Armenia, in which during the COVID-19 pandemic was along with the war situation. The impact of the pandemic as well as the unfavorable security situation will certainly have an impact on household survival in food consumption.

The innovation of this research was to examine changes in household-scale food expense during the COVID-19 pandemic situation in a relatively conducive security situation in Indonesia, compared to the changes in the same thing in the war situation in Armenia. The aims of the research were: 1) to find out the household description of Indonesian consumers, 2) to analyze the changes in consumption during the pandemic in Indonesia, 3) to analyze the changes in consumption during the pandemic in Armenia.

RESEARCH METHODS

In the case study in Indonesia, primary data was taken in April-May 2020 during the early days of the Covid-19 pandemic in Indonesia. The consumption data that measured including food, which was rice, the total value of household food expense, the value of cooked meal expense, and the value of snacks expense (snacks). All data were calculated for one week (seven days).

The research sample was households in the families of UMM students that spread in various cities in Indonesia. At the beginning of the Covid-19 pandemic, the majority of students returned to their hometowns because the learning process was performed online. The student sample was UMM Department of Agribusiness' students, but the household sample as the subject of the research was spread in various cities, including some outside Java. The city that spreading was also useful for collecting information on food availability in each location. Each sample was given a questionnaire about changes in consumption before and during the pandemic. The total number of samples that met the completeness of the questionnaire contents in the case study in Indonesia were 76 households.

The data measurement using a ratio scale, and some qualitative data in the form of an open questionnaire. Data were analyzed descriptively and statistically, which was paired t-test. The hypotheses that examined were: 1) the amount of rice consumption during the pandemic was different from before the pandemic 2) the amount of food expense during the pandemic was different from before the pandemic, 3) the amount of cooked meal expense during the pandemic was different from before the pandemic, 4) the amount of snacks expense during the pandemic different from before the pandemic.

The paired t-test procedure followed the formula from Field & Miles (2010). The completion of the analysis was using statistical computing software. The criteria for the significance of the test used the limit of significance value < 0.05 .

In the case study in Armenia, the changes in consumption during the pandemic were analyzed descriptively with a qualitative approach. Secondary data on food production, consumption and food prices were obtained secondary data from the Food and Agriculture Organization (FAO).

As a result of the secondary research of "Regional food market situation and policy bulletin" conducted by FAO Regional Policy Brief on the Impact of the COVID-19 Pandemic (Ros-Biznes-Consulting, 2020), the responses of the COVID-19 pandemic in the agri-food markets, value chains and policy were discussed. The information was gathered through ongoing surveys and monitoring in the region. Comparative data collection was conducted since 2019.

RESULT AND DISCUSSION

The Description of Indonesian Household Consumer

The descriptions of respondents included demographic and geographic data. Demographic data included the age and occupation of husband and wife, as well as total family income. Demographic data was expected to provide an overview on the socio-economic level of households and their purchasing power. Geographical data included the spread of the origin /city of the households that became respondent. Table 1 presented the demographic and geographic data of the respondents.

Most respondents were in the age range of 50-59 years. They were the productive age group who were still active in work activities. Most of the family heads were self-employed (47.2%). The consideration of family head data that the distribution was calculated (Table 1) was not all of the respondent's housewives work formally to earn income.

Table 1. Demographic of respondent family head

Demographic Indicator	Total	Percentage	Information
Age (year)			
40-49	20	26.3	-
50-59	42	55.3	Highest
≥ 60	14	18.4	-
Occupation			
Farmer	10	13.9	-
Self-employed	34	47.2	Highest
Government Employee	14	19.4	-
BUMN Employee	4	5.6	-
Other	10	13.9	-

Source: Primary data, 2020

Table 2 presented the geographic spread of respondents, which was the origin area of UMM students' family. The spread of respondents' origin area was mostly in East Java, reached to 60.5%. However, respondents that came from outside Java was also quite a lot (26.3%).

Table 2. The spread of respondents' origin area

Area/Origin	Total	Percentage	Information
Malang Raya	6	7.9	
East Java beside Malang Raya	46	60.5	highest
Java Island beside East Java	4	5.3	
Outside Java Island	20	26.3	

Source: Primary data, 2020

The important information that obtained from the geographic spread of respondents was about the availability of food in the market in their regions. In general, the availability of food in all areas of respondents' origin was still sufficient for their needs. Although some food prices had increased, they were still on reasonable limits. The slowness of the food supply chain in areas that have transportation barriers as stated by (Masniadi et al., 2020) did not occur in the area of respondents' origin.

The Changes of Consumption During Pandemic in Indonesia

At the beginning of the pandemic, consumption changes were quite significant in the respondent's household. The most visible and easy-to-measure change was the amount of rice consumed. The increase in the amount of rice consumption during the pandemic was caused by restrictions on activities outside the house, so that rice consumption tended to increase. The average household rice consumption for one week before the pandemic was 4.49 kg, during the pandemic it rose to 6.28 kg. If measured per capita, the increase in rice consumption rose from 1.96 kg to 2.74 kg (Chart 1).

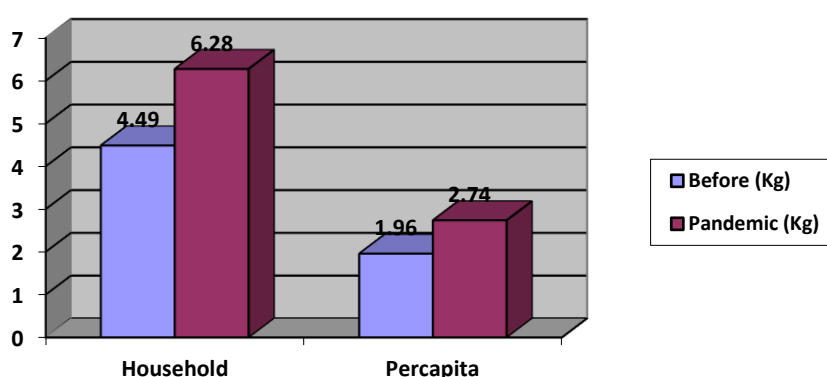


Chart 1. Rice consumption per week before and during Covid-19 pandemic

Furthermore, changes in the amount of consumption during the pandemic can also be seen from the total value of household expense for one week. Picture 2 presented the total value of household expense, expense on rice, expense for cooked meal, and snacks expense. Each shopping value was calculated for one week (seven

days). The total value of household expense increased from Rp 226,000 to Rp 308,000.

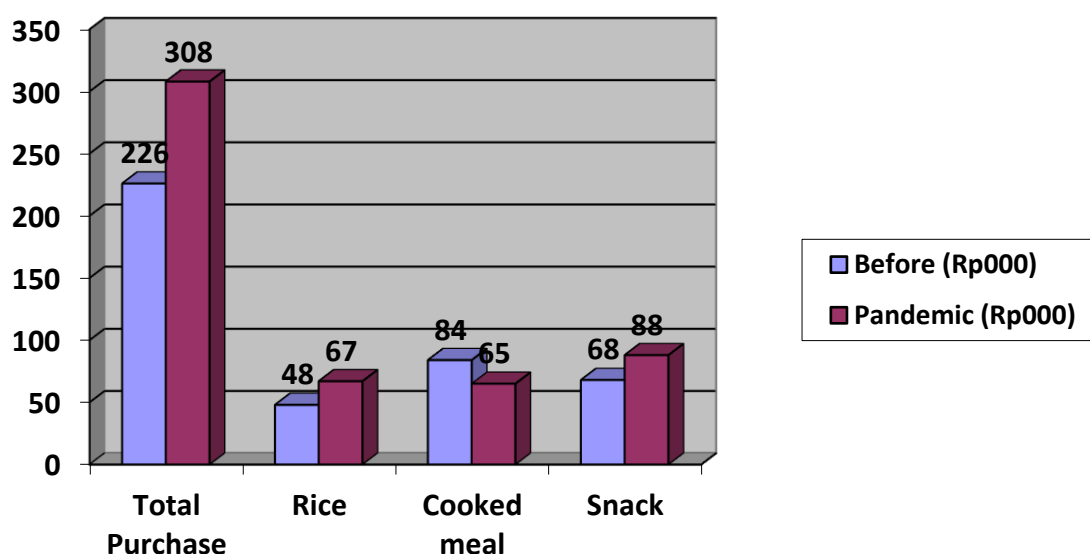


Chart 2. Food consumption expense before and during Covid-19 pandemic

If detailed, it can be seen in chart 2 that the expense value had increase and some had decrease. Rice expense increased from Rp 48,000 to Rp 67,000, consistent with the increase in consumption volume (chart 1). Snack expense had increased during the pandemic, from IDR 68,000 to IDR 88,000 during the pandemic. Meanwhile, the value of cooked meal expense had decreased from Rp. 84,000 to Rp. 65,000.

The hypothesis test compared the average household consumption during the COVID-19 pandemic with before the pandemic. The variables compared were the value of food consumption expense, the volume of rice consumption, the value of cooked meal expense, and the value of snacks expense. All variables were measured from respondents' household consumption for one week (seven days). The results of statistical tests were presented in Table 3.

Table 3. Paired t-test result of household consumption before and during COVID-19 pandemic

Indicator	Before pandemic	During Pandemic	% increase	t-value	Sig. (2-tails)
Purchase of total food (Rp/week)	369,473.7	455,368.4	+23%	2.882	.005
Rice consumption (Kg/week)	7.6	9.9	+30%	4.518	.000
Purchase of cooked meal (Rp/week)	115,894.7	83,289.5	-28%	- 3.052	.003
Purchase of snack (Rp/week)	93,947.4	113,421.1	+21%	1.388	.169

Source: Primary data analysis, 2020

Table 3 showed the test analysis results was difference between the average food consumption expense before and during the COVID-19 pandemic. The four indicators showed an increase in the average number during the pandemic, except for the expense on cooked food or cooked meal which has decreased. The highest percentage increase in consumption was in the volume of rice consumption per week, which increased by 30%. This increase in consumption was due to the fact that at the beginning of the pandemic, more families stayed at home due to limiting going out of the house, so household food consumption increased. The same explanation was also for the increase in total food expense (increase 23%).

A 28% decrease in expense occurred in the purchase of cooked meal. At the beginning of the COVID-19 pandemic, consumers tended to limit themselves from consuming food processed in stalls or restaurants. The reason was that there was a kind of distrust when food was processed by other parties, due to fear of exposure to the COVID-19 virus. Therefore, the decrease in consumption expense occurred in this expense category.

Statistical test with paired t-test obtained significant results on changes in the average expense on self-processed foodstuffs and the volume of rice consumption. The total consumption of self-processed foodstuffs increased during the pandemic compared to before the pandemic (sig. = 0.005). The volume of rice consumption was also increased compared to before the pandemic (sig.<0.001).

The increase in the amount of rice consumption and the value of total food expense in the respondent's household was different from the results of previous research that in aggregate, the COVID-19 pandemic reduced market demand for food products (Cranfield, 2020). This can happen because the majority of sample households were groups that not directly affected by COVID-19. They were a group of people who were still economically surviving in a pandemic situation, for example, it can be seen from the indicator of the ability to pay for school children in college. The record that the respondents were parents of UMM students. The respondents of this research were not the household economic group that affected by the pandemic, which experienced a decrease in food consumption expense (Sina, 2020). This can be a note of research weakness, that research on the same topic in the future needs to involve a wider sample of the economy down to the lowest tier.

The statistical test was also significant on cooked meal expense, but with a decrease in the amount of expense during the pandemic (sig.=0.003). Increased expense on snacks (snacks) by an average of 21% but the statistical test was not significant. This was because although the average snack consumption expense increases, many families with limited income experience a decrease in consumption expense on this category, or even did not buy at all. Families who continue to buy snacks were those who have sufficient purchasing power or there were still (small) children in their family.

The decline in consumption of cooked meal can be explained because consumers were careful in buying food. This supported (Chenarides et al., 2021; Olaimat et al., 2020) that the cause of changes in consumption patterns was the issue and belief in food safety. People were also motivated to prepare more food at

home because they wanted to consume healthy food, as stated by (Celik & Dane, 2020; Reyes-Olavarría et al., 2020) The results of this research also supported (Chenarides et al., 2021) which found that consumers reduce their consumption of fast food but at the same time increase the intensity of 'snacking' when they were mostly at home due to social distancing. This snacking phenomenon resulted in an increase in consumption of snacks (Graph 2), although when tested statistically it was not significant (Table 3).

The majority of food stocks in respondent households were for one week's needs. Before pandemic, food stocks were generally on durable foodstuffs, such as rice, cooking oil, frozen food, and eggs. But during the pandemic, they also stored fresh food (vegetables, fruit, chicken). It turned out that the pandemic has changed spending patterns by preparing food stocks, on average for one week's needs. Although there were few respondents who were very psychologically worried, they kept food stocks for one month. The results regarding food were the same as the discovery of (Amicarelli & Bux, 2021) that the pandemic increased the stock of food needs and the amount of shopping to ensure an adequate nutritional intake for family members.

The Change of Consumption During Pandemic in Armenia

Regarding the COVID-19 pandemic, as well as the post-war crisis in the Republic of Armenia, it has had a negative impact on transportation, storage, sales, financial situation, access, and availability of agricultural products and labor markets.

According to the FAO Regional Policy Brief on the Impact of the COVID-19 Pandemic, the prospects for grain/cereal production in the Republic of Armenia were positive, but wheat production was expected to decrease. Some food prices in Armenia had risen compared to 2019, but prolonged trade and market disruptions continue to challenge the value chains of agricultural products. There were disruptions to the sales process, among other reasons, due to lower demand and stricter food safety controls used mainly for vegetables, fruits, and meat products.

Thus, digital solutions for agricultural marketing, that is Digital Agriculture Marketplace Platform have been adopted. Financial initiatives and programs have been developed to overcome the financial challenges of the crisis, which mainly concerns on social entrepreneurship in agriculture (FAO, 2020). It should be noted that social assistance packages are being prepared to ensure access to food for the socially vulnerable population of the country.

The production of essential foodstuffs for consumption, wheat production, has decreased, which was due to unfavorable weather conditions, access to agricultural inputs (such as seeds, fertilizers). Besides, it was a reason for the state of war in Nagorno Karabakh, with the deportation of people. Agriculture was neglected, as the population has been evacuated, and the villagers from Nagorno Karabakh have settled in a number of major cities in the Republic of Armenia (Mkoyan, 2020). Retail prices for key basic foods increased significantly in the first half of the year compared to the same period in 2019, which implied a significant increase in the cost of healthy nutrition.

Particularly, the increase in the prices of basic foodstuffs has caused a significant negative impact on food security and nutrition. As a result, households spent almost half of their budgets on food, especially for vulnerable groups, including pensioners. Consequently, not only consumers but all participants in the agri-food value chain suffered from this negative impact. Although, some farmers spent less money on food, others were forced to sell means of production to withstand and overcome financial shocks.

There were disruptions to the sales process, among other reasons, due to lower demand and stricter food safety controls used mainly for vegetables, fruits, and meat products. This problem has triggered a tendency to store canned food. Housewives began canning apricots, peaches, plums, apples, other fresh fruits, jams, juices, tomato paste, eggplant, cucumbers, cabbage, also pickling other canned vegetables.

It should be noted that great importance was attached to the activities of social entrepreneurs, for instance, a beekeeper prepared various products in the form of tea supplements, candies, and other creative products. Then the sale took place while participating in the exhibition, 50 (+-) percent of the profit was given to the community or some vulnerable groups. By supporting social enterprises, it was an effective method of supporting citizens displaced by the war in Nagorno Karabakh. In other words, they not only received help from state and non-state organizations and community service, but they also earned income by cooking Artsakh (Nagorno Karabakh) homemade dishes and selling them. At the same time, Artsakh cuisine was spread over Armenia, such as Zhingyalov hats, which was a type of flatbread stuffed with finely diced 25 types of herbs and green vegetables.

Furthermore, social assistance packages were being prepared to ensure access to food for the socially vulnerable population of Armenia. As a result of the COVID-19 Pandemic and the post-war crisis, despite the rise in prices for essential foodstuffs, society and the state system were still in the process of finding ways to overcome and stabilize the situation.

CONCLUSION

The conclusion was the impact of the pandemic actually increased the need for household food consumption and expense, both in Indonesia and in Armenia. The availability and distribution of food stuffs still meet the needs of the community. Even though there was an increase in the price of some foodstuffs, the purchasing power of households was still affordable.

RECOMMENDATION

The recommendation was that food logistics transportation support was very much needed in the pandemic era and more specifically supported by food distribution security. Due to the situation of food shopping which was constrained by social distancing, digital solutions for food marketing with the "Digital Agriculture Marketplace" platform were important to implement. The future research needs to examine the same variables when the pandemic has been going on for a long time, and needs to involve samples from the lower class of the economy.

THANK YOU NOTE

The independent research was conducted as a form of academic contribution to society to analyze the impact of the COVID-19 pandemic situation with scientific studies. Thanks to UMM students and parents who have participated in the case study in Indonesia, and to FAO for the availability of data to support the case study in Armenia.

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