

THE IMPACT OF HOUSEHOLD CHARACTERISTICS ON THE DEMAND FOR ANIMAL PROTEIN FOOD AWAY FROM HOME IN JAKARTA

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Abstract Socio-economic conditions and demographics determine people's lifestyles, including food consumption expenditures. So far, research on food consumption away from home has only used a homogeneous household sample, and only a few have been found in Indonesia. This study aimed to analyze household characteristics' impact on animal protein food expenditure away from home using quantile regression analysis. The study used secondary data consisting of 4,346 household data in Jakarta from SUSENAS March 2020. The results show that spending on animal protein foods away from home in all income quintiles is not affected by household income. It shows that all household groups at various income levels have consumed animal protein foods away from home. Factors that have a positive and significant effect on protein food expenditure away from home are household food expenditure, age of the head of the family, number of family members, wife's education level, and location of residence. The presence of children under the age of 17 has a negative and significant influence. Therefore, it is necessary to monitor and guarantee food safety by producers and consumers to meet the adequacy of protein per capita which is healthy and nutritious.

Keywords: *animal protein, food away from home, household, quantile regression, socioeconomic*

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INTRODUCTION

Indonesia's economic conditions in terms of Gross Domestic Product experienced an average increase of 5.03 per year in 2015 – 2019 (BPS, 2019). It is in line with the fiscal and monetary policies implemented by the government to strengthen the investment and domestic consumption sectors. The manufacturing industry is the sector with the largest contribution to the economy, accompanied by an increase in the number of labor needs. Data from the BPS (2021) noted that Jakarta as the nation's capital has a population of workers/employees/employees reaching 59.96 percent of the total workforce, with a labor

productivity level of Rp. 595.03 million per population in 2017. 2020. This condition can be a big potential to encourage economic growth through increasing the amount of domestic consumption.

Mottaleb et al. (2017) mentions that household preferences in consuming food can change as income increases. However, the workforce's high productivity also shows that they have a high level of activity. Consumers with increasingly prosperous conditions and high busyness tend to eat food away from home (Bai et al., 2010). Busyness to work causes households to prefer alternatives to eating foods that are more

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practical and comfortable with various choices (Nurbani, 2015). Therefore, the lifestyle of consuming food away from home is a trend that continues to grow rapidly, not only in developed countries but also throughout the world. Farfán et al., (2017) mentioned that urbanization and women's participation in work also contributed to this increasing trend, as indicated by the increasing proportion of food expenditure away from home. The proportion of per capita expenditure on processed food and beverages in Indonesia increased by 4.5 percent annually from 2015-2019 (BPS, 2021b). An increase in accommodation and food and beverage providers also accompanies it.

The popularity of food consumption away from home has increased over the last few years, in line with the development of protein consumption in Indonesia. Total protein consumption per capita per day increased by 3% per year (Central Bureau of Statistics, 2020). Even since 2016, this number has been above the protein adequacy rate applicable in Indonesia, 57 grams per person per day. Thus, food consumption away from home also impacts meeting protein needs per capita. However, consuming food away from home also carries a risk of poorer quality than food prepared at home (Powell & Nguyen, 2013). So the impact on health is also a danger that must be watched. Therefore, this study aims to analyze the factors influencing the demand for animal protein food away from home in Jakarta.

Apart from being rarely done in Indonesia, research on food consumption patterns away from home has only used homogeneous household samples. Whereas Mottaleb et al., (2017) asserted that the specificity of the socioeconomic characteristics possessed by households is an important factor in determining the decision to consume food away from home. In addition, income allocation is also influenced by household characteristics. Therefore, this study seeks to complement previous research, by analyzing the impact of household characteristics on animal protein food consumption. Households will be divided into four income groups to capture more accurate phenomena based on household income levels.

RESEARCH METHODS

This research was conducted in January-April 2022 using secondary data. The data used consists of 4,346 household samples in Jakarta, which were obtained from the Central Statistics Agency based

on the results of the March 2020 National Socio-Economic Survey. Data analysis was carried out using quantile regression, dividing the data into 4 income groups. Quantile regression is used to overcome the limitations of linear regression that do not meet the classical assumptions (Saidah et al., 2016). In addition, quantile regression also has the advantage of modeling predictor functions to identify more effects and certain conditions in each part of the data distribution (Oyedapo et al., 2021). Therefore, the study's results can inform the effect of household characteristics in each income quintile.

According to Firpo et al., (2009) unconditional quantile regression was constructed using the concept of influence function (IF), which represents the influence of individual observations on a statistical distribution $v(F_Y)$. The addition of the $v(F_Y)$ statistic will result in a recentered influence function (RIF), which has the same expectation as $v(F_Y)$ and can calculate most of the statistical distributions. Influence function on the n -th quantile:

$$IF(Y; q_n, F_Y) = (n - 1 \{Y \leq q_n\})/f_Y(q_n) \quad (1)$$

So that

$$RIF(Y; q_n, F_Y) = q_n + IF(Y; q_n, F_Y) \quad (2)$$

The conditional expectation of $RIF(Y; v, F_Y)$ is modeled as an explanatory variable, where the RIF regression model is formulated as:

$$E[RIF(Y; v, F_Y) | X] = mv(X) \quad (3)$$

So that in the quantile condition, we get $E[RIF(Y; q_n, F_Y) | X] = mn(X)$ as an unconditional quantile regression. Unconditional quantile regression can be formulated as:

$$RIF(y; q_n) = q_n + \frac{n - I[y \leq q_n]}{f_Y(q_n)} \quad (4)$$

The household characteristics used in this study are viewed from several socio-economic variables presented in table 1.

Table 1. Socio-economic characteristics of the household

Variable	Operational definition
Household income (X1).	Income is approximated by one household's last week's expenditure for food and non-food consumption (Rp).
Household food consumption expenditure (X2).	One household's last week's expenditure for food consumption (Rp).
Number of household members (X3).	All people residing in a household at the time of enumeration or temporarily

Variable	Operational definition
	absent (Persons).
Presence of children under 17 years old (X4).	Presence of children under 17 years old in the household (1: yes, 0: none).
Age of the head of the family (X5).	The age of the head of the household whose birthday is March 2020 (Year).
Wife's length of education (X6).	The highest level of formal education is based on the diploma owned by the wife (Years).
Area of residence (X7).	Classification of the area of residence based on the geographical area of the household's position (1: non-islands, 0: islands).

RESULTS AND DISCUSSION

Based on BPS data from DKI Jakarta Province (2022), the condition of food demand in terms of the average monthly expenditure per capita per month for the people of Jakarta will reach 39.54 percent of total expenditure in 2021. The Kepulauan Seribu is the area with the highest percentage of food expenditure compared to five other regions, namely of 62.85 percent of the total expenditure. Meanwhile, five other regions in DKI Jakarta have food expenditure percentages between 34.61 to 42.26 percent of total per capita expenditure, with the lowest percentage in North Jakarta. The descriptive statistics of household socioeconomic characteristics can be seen in table 2.

Based on the data in table 2, the range of data used in this study can be seen through the minimum and maximum data values. The mean value shows the average of the data. While the standard deviation provides information about the variation of the data to the average value (Sugiyono, 2013). So the data can be said to be heterogeneous when the standard deviation value is getting bigger.

Table 2. Descriptive statistics of household characteristics

Var	Mean	Std. Dev.	Min.	Max.
Y	53466	58708.36	1000	736000
X1	1927318	2137247	154761.9	4.41E+07
X2	807707	491118.6	92142.86	7446086
X3	47	13.09603	16	97
X4	3	2.097391	0	13
X5	0	0.494151	0	1
X6	9	4.699013	0	23
X7	1	0.266022	0	1

The expenditure on animal protein food away from home per week ranges from Rp. 5,000 to Rp. 736,000. While the value of household income per week is in the range of Rp. 154,761.9 to Rp. 44,100,000. Meanwhile, household expenditures for total food consumption per week reached Rp. 92,142.86 to Rp. 7,446,086. Thus, the share of food expenditure in terms of average consumption reached 41.9% of total household expenditure. The average head of the household is still in the productive category, namely 47 years, with an average wife's education of 9 years or secondary education.

Table 3. Results of quantile regression analysis

Y	Quantile 12.5		Quantile 37.5		Quantile 62.5		Quantile 87.5	
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
X1	0.0002	0.140	-0.0002	0.552	-0.0007	0.314	-0.0009	0.569
X2	-0.0001	0.909	0.0034	0.051*	0.0067	0.023**	0.0105	0.127
X3	20.666	0.287	-31.079	0.511	-167.01	0.038**	-263.34	0.160
X4	-292.49	0.033**	-48.181	0.885	1374.4	0.016**	3202.9	0.016**
X5	-1763.9	0.002***	-4815.6	0.000***	-10677	0.000***	-22343	0.000***
X6	219.50	0.000***	785.21	0.000***	1514.1	0.000***	3694.0	0.000***
X7	1259.6	0.153	6049.8	0.005***	17564	0.000***	44455	0.000***
constant	8083.5	0.000	14820	0.000	24720	0.000	37199	0.005

* p < 10%

** p < 5%

*** p < 1%

Based on the results of table 3, it can be seen that household characteristics in each income quintile have different influences on the

consumption of animal protein foods away from home. The condition of each variable that affects

the expenditure of animal protein away from home can be explained as follows:

Household Income

The analysis results show that this variable has no significant effect on consuming animal protein foods away from home. It can happen because food consumption away from home has become a rapidly growing trend in all levels of society regardless of income level. In line with Cupák et al. (2016), the more households that participate in food consumption away from home, the elasticity of their income will decrease and become normal goods for consumption. The increasingly rapid changes in socioeconomic characteristics have also caused the trend of food consumption away from home to increase continuously in the next few years (Liu et al., 2013).

Household Food Consumption Expenditure

This variable has a significant effect on quantiles 37.5 and 62.5. An increase in food expenditure leads to increased spending on consuming all types of food. It can be said that households will increase the variety in their food consumption by increasing their consumption of protein foods away from home. In addition, the population dominated by urbanites tends to spend their food by consuming prepared food (Haq et al., 2014).

Number of Household Members

This variable has a significant effect on almost all quantiles, except 37.5. Thus, the number of family members contributes to the amount of animal protein food away from home consumed by households. From the demand side, the more family members, the consumption of animal protein foods away from home will also increase (Haq et al., 2014). In quantile 12.5, an increase in the number of family members by 1 person reduces animal protein food expenditure away from home by Rp. 292.49. While in quantiles 62.5 and 87.5, an increase in the number of family members by 1 person will increase the expenditure of animal protein food away from home by Rp. 1374.4 and Rp. 3202.9, respectively. The amount of food expenditure corresponds to the household size because each family member contributes to the expenditure (Khan & Mohanty, 2022).

Presence of Children Under 17 Years Old

This variable has a significant effect across income quintiles. It shows that households with children under 17 years have the opportunity to reduce protein food consumption away from home. Households with children under 17 can reduce the amount of animal protein food expenditure away

from home by Rp. 1763.9, Rp. 4815.6, Rp. 10677, and Rp. 22343, respectively. Households pay more attention to the safety of nutrition consumed by children because children need quality food intake at that age to develop physically and cognitively (Marshall et al., 2014). Meanwhile, food consumption away from home generally has high calories and fat, so it has the potential to cause obesity, diabetes, and heart disease if consumed in excess (Richards et al., 2012).

Age of The Head of The Family

At quantile 62.5 this variable significantly affects protein food expenditure away from home. The negative variable coefficient indicates that households in this income group tend to switch to healthier food consumption patterns along with increasing age by reducing food consumption away from home. An increase in the age of the head of the family by 1 year will affect reducing the expenditure of animal protein food away from home by Rp. 167.01. The number of calories and excess fat can be one of the strong reasons to avoid health risks from consuming food away from home (Liu et al., 2013). The research results of Cantillo et al. (2021) have also revealed that older people can consume less food away from home.

Wife's Length of Education

Wife's education has a significant effect on all household income quintiles. The positive coefficient indicates that the longer the wife is in education, the higher the food consumption away from home. An increase in the wife's education period by 1 year will increase the expenditure on protein food away from home by Rp. 219.5, Rp. 785.21, Rp. 1514.1, and Rp. 3694, respectively. Higher education encourages women to participate in work so they need more time to cook. They are faced with a time trade-off to carry out household production and prefer to consume food away from home (Sangwan & Kumar, 2021).

Area of Residence

The location of household residence significantly affects protein food expenditure away from home at quantiles 37.5, 62.5, and 87.5. This condition shows that households living in non-archipelagic Jakarta have a greater opportunity to consume protein foods away from home. Households in non-island areas have a greater chance of Rp. 6049.8, Rp. 17564, and Rp. 44455 to consume animal protein foods away from home at quantiles 37.5, 62.5, and 87.5. Hawkes et al. (2017) mentions that people living in urban areas have more diverse food choices, more animal products

are available, and they consume food away from home.

CONCLUSION

Based on the results of this study, the socio-economic characteristics of households in each income quintile have different effects. Overall, the variables that influence the expenditure of animal protein away from home include food expenditure, age of the head of the household, number of household members, presence of children under 17 years of age, wife's education and area of residence. Households have reduced the amount of consumption due to the presence of children under the age of 17 years, but the wife's higher education also encourages increased consumption of animal protein foods away from home. The level of household income which has no significant effect indicates that consuming animal protein foods away from home has spread to various layers of Jakarta's society. Therefore, efforts are needed to improve food safety assurance for consumers and provide convenience for the certification process for food providers. In addition, the implementation of the tax is expected to increase the selling price of food away from home, so that it can reduce the amount of excess consumption.

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