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The Relationship Between Household Characteristics and Beef Consumption in Batang Toru District, South Tapanuli Regency

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Abstract. Animal protein one of which is obtained by consuming meat. This study aims to determine the social and economic characteristic of household and to analyze the factors that influence household beef consumtion in Batang Toru District. The analytical method used is descriptive analysis by directly observing the social and economic conditions of the household, then using a questionnaire to obtain data on the socio-economic conditions of the household. The results of the study indicate that beef consumers in Batang Toru district have differents socio-economic charasterictics, both in terms of education, age, number of family members and income. The socio-economic charasteristics of beef consumers, namely education, age, number of family members and income, have a significant effect on the amount of beef consumption. While the variable number of family members does not significantly affect on the amount of beef consumtion.

Keywords: age, beef consumption, education, income, south tapanuli regency

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1. Introduction

The development of livestock in Indonesia, especially ruminants, is expected to be one of the locomotives of development, especially in providing sources of animal protein in the form of meat and milk in order to increase people's food consumption. Human needs for livestock include meat, eggs and milk. In particular, meat needs in Indonesia are mostly met from beef, mutton and chicken. The need for beef as a source of animal protein in Indonesia is increasing in line with increasing public awareness of the importance of balanced nutrition, population growth and people's purchasing power of beef is also increasing. [1] stated that the increasing population and changes in consumption patterns and people's tastes have caused national beef consumption to tend to increase.

One of the providers of a great source of protein is meat. The Minister of Trade, Enggartiasto Lukita in 2017 admitted that the consumption of beef by the Indonesian people is still very low. Enggar said that until 2017 meat consumption per capita (person) was only 2.9 kg per year. He also said "This is actually related to the level of people's income because anyone would want to eat meat but they just can't afford it".

Demand for animal protein from livestock (meat, eggs and milk) from time to time tends to increase in line with population growth, income, nutritional awareness, and improvement in education levels. Meanwhile, the supply of animal protein sources, especially meat, has not been able to keep up with the increasing number of domestic demands. Beef production in the district South Tapanuli amounted to 291,297 tons [2]. Batang Toru sub-district was chosen as the research location because this area has the largest population in South Tapanuli Regency than other sub-districts. Research respondents are housewives, this is based on the consideration that housewives are the people who have the most role in determining consumption in a household.

2. Materials and Method

In this research, several steps were carried out, namely:

1. The first step is to use a (simple random sampling method), where the sampling of population members is carried out randomly without regard to the strata that exist in the population.

2. The second step is to take purposively (purposive sampling), Batang Toru sub-district was chosen because of this area has the largest population in South Tapanuli Regency compared to other sub-districts.

3. The third step is to determine the number of samples (slovin sampling of respondents) where Batang Toru sub-district is the sub-district with the most number of family members, namely 9151 families.

2.1. Data Collection Methods

The data obtained in this study consists of :

1. Primary data were obtained from interviews using questionnaires and housewives (respondents) that had been prepared previously.

2. Secondary data is obtained from various related agencies such as government agencies related to agriculture and animal husbandry.

2.2. Descriptive Analysis

Descriptive analysis used in this study by observing and analyzing the socio-economic characteristics of beef consumers in Batang Toru District, South Tapanuli Regency. Observation of the socio-economic characteristics of beef consumers was carried out through interviews using questionnaires.

$$Y = a + b1X1 + b2X2 + b3X3 + b4X4 + \mu$$

Description:

Y	= Amount of beef consumption (kg/month)
a	= Intercept coefficient (Constant)
b1, b2, b3, b4	= Regression coefficient
X1	= Level of education
X2	= Age (Year)
X3	= Number of family members (Soul)
X4	=Income (Rp/month)
μ	= Intruder error

2.3. Test of Goodness of Fit

1. The coefficient of determination R2 is a statistical value calculated from the sample data. This coefficient shows the percentage of variation of all dependent variables that can be explained by changes in the explanatory variables. This coefficient is a measure of the extent to which the independent variable can change the dependent variable in a relationship.The value of the coefficient of determination (R2) ranges from $0 < R2 < 1$, with the test criteria being that the higher R2 (closer to 1) indicates the model formed is able to explain the diversity of the dependent variable, and vice versa.

2. The F test is used to show whether all independent variables that are included in the model simultaneously have a significant effect on the dependent variable. The F test is intended to determine the level of statistical significance of the regression coefficient simultaneously. The significance value (α) used in social science is 0.05.

Testing Criteria:

If sig. F 0.05 then H0 is rejected and H1 is accepted.

If sig. F > 0.05 then H0 is accepted and H1 is rejected.

3. The t-test is used to show whether all independent variables included in the model partially have a significant effect on the dependent variable. The t test is intended to determine the level of statistical significance of the regression coefficient partially. The significance value (α) used in social science is 0.05.

Testing Criteria:

If t count t table or if the significance value > : then H0 accept H1 reject

If t count > t table or if the significance value is : then H1 accepts H0 rejects

2.4 . Classic Assumption Test

Classical assumption test is a statistical requirement that must be met in multiple regression analysis based on Ordinary Least Square (OLS). In principle, the linear regression model built should not deviate from the BLUE assumption (Best, Linear, Unbiased, and Estimator). There are three classical assumption tests that will be used in this study, namely normality, heteroscedasticity, and multicollinearity tests.

1. Normality test is a test used to determine whether the data distribution is close to the normal distribution. Normality test can be done with the Kolmogrov Smirnov test, by looking at the significance value.

   Sig.KS> 0.05 = Data is normally distributed
   Sig.KS ≤0.05 = Data is not normally distributed

2. The heteroscedasticity test aims to see whether in the regression model there is an inequality of variance from the residual of an observation to another observation in the regression model. If the residual from one observation to another is fixed, then it is called homoscedasticity or there is no heteroscedasticity. A good regression model is one with homoscedasticity or no heteroscedasticity. This study uses the Scatterplot test as a test of heteroscedasticity, by looking at the significance value.

   Sig. > 0.05 = Homoscedasticity (no heteroscedasticity problem)
   Sig. ≤0.05 = Heteroscedasticity

3. Multicollinearity test aims to test whether the regression model found correlations between independent variables. A good regression model should not have a correlation between the independent variables. If the independent variables are mutually correlated, then the variables are not orthogonal. Orthogonal variables are independent variables whose correlation values are among independent variables. How to detect the presence or absence of multicollinearity in the regression, namely:

   - Analyze the correlation relationship which is quite high (above 0.8)
   - Analyze regression model is free from multicollinearity problems if the tolerance value is less than 0.1 and the VIF value is more than 1.0.

3. Results and Discussion

3.1. Respondent's Socio-Economic Characteristics

1. Education

Table 1. Characteristics of the sample by education level

Characteristics	Number Of Responden (Person)	Percentage (%)
Primary school	21	21.21
Junior high school	18	18.18
High School	38	38.38
Diploma	5	5.05
Under Graduate	17	17.17
Total	99	100.00

Source: Primary data processed 2021

2. Age

Table 2. Characteristics of the sample by age (Age)

Age (Old)	Number Of Responden (Person)	Percentage (%)
Children (5-14 tahun)	0	0
Young Age (15-29 tahun)	14	14.15
Matured (30-49 tahun)	69	69.69
Old Age (>50 tahun)	16	16.16
Total	99	100.00

Source: Primary data processed 2021

3. Number of family members

Table 3. Characteristics of the sample based on the number of family members

Characteristic (Person)	Amount (rt)	Percentage (%)
1 – 3	52	52
4 – 6	42	43
7 – 9	5	5
Total	99	100.00

Source: Primary data processed 2021

4. Income

Table 4. Sample characteristics by income

Charasteristic (Rupiah)	Amount (Person)	Percentage (%)
<IDR 2.900.000	52	52
IDR 2.900.000 – IDR 5.800.000	42	43
≥ Rp 5.800.000	5	5
Total	99	100.00

Source: Primary data processed 2021

3.2. Classic assumption test

3.2.1. Normality test

Table 5. Nomality test

		Not Standardized Residual
N		99
Normal Parameter [a,b]	Mean	.0000000
	Standard Deviation	.49444905
Most Extreme	Absolute	.069
	Positive	.054
	Negative	-.069
Statistical test		.069
Asymp. Sig. (2-tailed)		.200[c,d]

Source: Primary data processed 2021

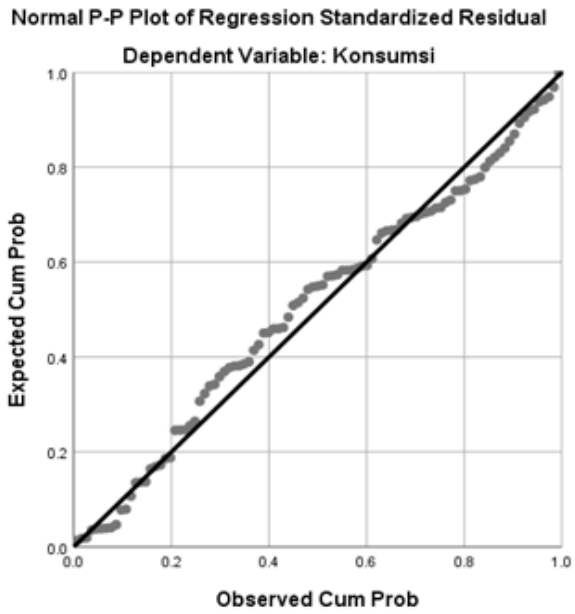

Figure 1. Normality test using the graph method

3.3.2. Heteroscedasticity Symptom Test

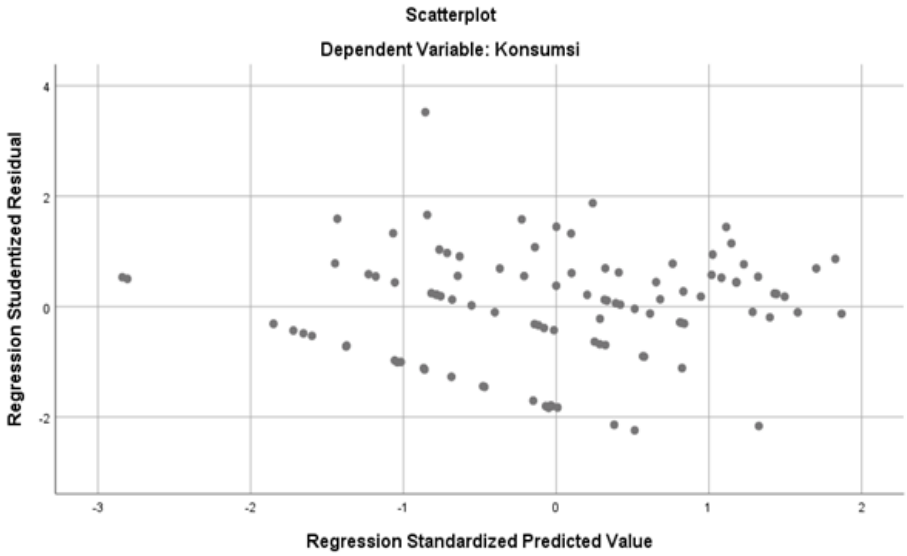

Figure 2. Heteroscedasticity symptom test using the graph method

Heteroscedasticity test is conducted to test whether in the regression model there is an inequality of residual variables from one observation to another observation. To find out, it is necessary to do a scatterplot test. Attachment points spread above and below the number 0 on the dependent variable axis, it can be concluded that they do not experience heteroscedasticityor are free from heteroscedasticity symptoms.

3.3.3. Multicollinearity Symptom Test

Table 6. Multicollinearity Symptom Test

Coefficients[a]						
Coefficient					Statistic Colinearity	
B	Std. Error	Beta	T	Sig.	Toleransi	VIF
.235	1.641		2.036	.000		
.125	.112	.106	1.115	.006	.697	1.435
.047	.259	.016	.182	.004	.791	1.265
-.092	.105	-.074	-.875	.384	.896	1.117
.601	.090	.590	6662	000	.806	1.241

Source: Primary Data processed 2021

Based on the classical assumption test, the data used have normal residual values, there is no heteroscedasticity, and there is no multicollinearity. So the data deserves to be analyzed further.

Regression Equation.

The regression estimation equation is a systematic formula that shows the relationship between one variable or several independent variables on the dependent variable. Based on the appendix, the regression equation of the factors that affect the amount of beef consumption in Batang Toru District, South Tapanuli Regency is as follows:

$$Y = 0{,}235 + (0{,}125)\ X_1 + (0{,}047)\ X_2 + (-0{,}092)\ X_3 + (0{,}601)\ X_4$$

Information :
Y = Total Meat Consumption (Kg/Year)
X1 = Education
X2 = Age (Years)
X3 = Number of Family Members
X4 = Income (Rp/Month)
Based on the above equation it can be explained that:

From the above equation, a constant value of 0.235 can be obtained. This shows that the effect caused by the independent variables of education, age, number of family members, and income affects the dependent variable the amount of household beef consumption is 0.235 or if the value of the independent variable is considered equal to zero (= 0), then the value of the dependent variable consumption beef is 0.235 kg/year.

3.3.4. Model Fit Test

1. Coefficient of Determination Test (R2)

The coefficient of determination test is to find out how far the independent variable affects the dependent variable. Based on the analysis, the coefficient of determination was 0.406, which means that the independent variables used were able to influence the dependent variable by 40.6%, while 59.4% were influenced by other factors. According [3] that for regression with more than two independent variables, R Square is used as the coefficient of determination.

Table 7. Coefficient of Determination Test (R2)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.637[a]	.406.381	.50486	

Source: Primary data processed

2. Simultaneous Test (Statistical F Test)

F-Statistical Test is a test to see the effect of independent variables simultaneously affecting the dependent variable. All independent variables are said to affect the dependent variable if the F-count value > F-table or the probability value is less than 0.05. From the results of the analysis in the ANOVA table, it is 0.000 or less than 0.05, which means that education, age, number of family members, and income simultaneously affect the amount of beef consumption. Therefore, the next

test was carried out, namely the statistical t test to see the variables that affect the amount of household beef consumption.

Table 8. Simultaneous Test (Statistical F Test)

ANOVA[a]						
Model		Sum of Squares	df	Mean square	F	Sig.
	Regression	16.378	4	4.095	16.065	.000[b]
	Residual	23.959	94	.255		
	Total	40.337	98			

Source: Primary data processed 2021

3.Partial Test (Statistical t Test)

This partial test aims to determine what factors are among the independent variables that affect the amount of beef consumption in Batang Toru District, South Tapanuli Regency. If the independent variable has a probability less than 0.05 then the variable significantly affects the amount of household beef consumption.

Table 9. Partial Test (Statistical T Test)

Coefficients[a]						
		Unstandardized		Coefficients		
		Standardized		Coefficients		
Model		B	Std. Error	Beta	tSig.	
1	(Constant)	.235	1.641		2.036	.000
	Education	.125	.112	.106	1.115	.006
	Age	.047	.259	.016	.182	.004
	Family Member	-0.92	.105	-.074	-.875	.384
	Income	.601	.090	.590	6.662.000	

Source: Primary data processed 2021

Based on “Table 9”, it can be explained as follows:

1. Educational independent variable (X1) Partially has a significant effect on the amount of beef consumption (Y). Has a probability value of 0.006 less than 0.05.

2. The independent variable age (X2) partially has a significant effect on the amount of beef consumption (Y). Has a probability value of 0.004 less than 0.05.

3. The independent variable number of family members (X3) partially has no significant effect on the amount of beef consumption (Y). Has a probability value of 0.384 greater than 0.05.

4. The independent variable income (X4) partially significantly affects the amount of meat consumption (Y). Has a probability value of 0.000 less than 0.05.

3.4. Factors Affecting Beef Consumption

1. Education Variable (X1)

The results of the education analysis on the amount of beef consumption have a regression coefficient value of 0.125, which means that if the education level increases by one unit, it will increase the amount of beef consumption by 0.125 kg/year. The higher the formal education of the community, the knowledge and insight about the importance of the quality of the food consumed by the community to improve health will cause the food consumed to be more varied [4]. A positive sign on education shows a positive effect on the amount of beef consumption, which means that if the level of education increases, the amount of consumption will increase. With a sufficient level of education, a person will realize the importance of consuming beef and trying to get it. The significance value for the education variable is 0.006 which is smaller than 0.05. This shows that the research hypothesis on the education variable has a partial effect on the amount of beef consumption.

2. Age Variable (X2)

The results of the analysis of the amount of beef consumption have a regression coefficient value of 0.047, so every 1 year increase in age causes an increase in beef consumption of 0.047 kg/year with the assumption that other variables are considered constant. It can be seen in "Table 5", that the majority of respondents are adults aged 30-49 years with a percentage of 69.69%.). This shows that the respondents have a productive age. The more people of productive age, the level of consumption will increase. This is because the person has the opportunity to work so that he will get additional income. In the age group that is classified as old, namely more than 60 years, it has begun to enter a less productive age. The significance value for the age variable is 0.004 which is smaller than 0.05. A positive sign of age shows a positive effect on the amount of beef consumption, which means that if age increases, the amount of consumption will increase. This shows that the research hypothesis on the age variable has a partial effect on the amount of beef consumption. The age variable has a significant effect on the 95% confidence level [5].

3. Variable Number of Family Members (X3)

The results of the analysis of family members on the amount of beef consumption have a regression coefficient of -0.092, so every increase in the number of family members by 1 person causes a decrease in beef consumption by 0.092 kg/year assuming other variables are considered constant. A negative sign on the number of family members shows a negative effect on the amount of beef consumption, which means that if the number of family members increases, the amount of beef consumption will decrease. This result is in line with the research conducted by [6] which has a regression coefficient value of -0.820, which means that every increase in the number of family

members of 1 person has a negative effect on the dependent variable at the 95% confidence level. It should also be noted that the commodity under study is beef, which has a higher price than other types of meat. It should also be noted that from the data of 99 samples, the average income is only about 4 million rupiah, where the sample will tend to think that beef is expensive so they decide to consume other types of meat and with a large number of family members will be more concerned with quantity than quality. The significance value for the variable number of family members is 0.384, which is greater than 0.05. This shows that the research hypothesis on the variable number of family members does not partially affect the amount of beef consumption.

4. Income Variable (X4)

The result of income analysis on the amount of beef consumption has a regression coefficient value of 0.601, so every increase in income of IDR. 1.000.000,- causes an increase in beef consumption of 0.601 kg/year assuming other variables are considered constant. A positive sign on income shows a positive influence on the amount of beef consumption, which means that if income increases, the amount of consumption will also increase. The significance value on the income variable is 0.000 which is smaller than 0.05. This shows that the research hypothesis on the income variable affects the amount of beef consumption. The higher a person's income, the purchasing power of an item will increase. This makes the purchasing power of respondents to beef increases when income increases [7]. The income variable has a significant influence on beef consumption because the per capita meat consumption is very low, namely 2.9 kg per year in Indonesia [8]. This is also supported by data from [9], which shows the high consumption of beef in Jakarta which reaches 5.39 kg per capita per year. In line with population growth and the increase in the number of the upper middle class, the demand for animal protein also increases. Beef has become part of the staple diet in households, making it a regular consumption for most people. In 2019, the demand for Indonesian beef is estimated to reach 686 thousand tons, with an Annual Growth Rate (CAGR) of 4.6 percent annually [10].

4. Conclusion

Socio-economic characteristics of consumers, namely education, age, number of family members and income contribute to beef consumption. While the variable number of family members does not caused on the amount of beef consumption.

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