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Analysis of Factors Affecting Demand for Cattle Meat in the City of Padang Sidempuan

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Abstract. The amount of beef consumption has fluctuated from year to year. The large amount of public consumption of beef is a reflection of the condition of public demand for beef, which is estimated to have a number of causes. The purpose of this study was to identify factors of beef price (X1), family income (X2), number of dependents (X3), price of chicken (X4), price of fish (X5), price of tofu / tempe (X6) of meat demand in the city of Padang Sidempuan. The method of analysis is multiple linear regression analysis using SPSS 22.0. The sampling technique had 150 respondents. The results showed that the estimation results obtained a determination value (R2) of 0.666. Simultaneously, all independent variables had a significant effect (P <0.05) on the amount of beef demand. Partially, family income, number of dependents, and the price of chicken have an effect on beef demand. Meanwhile, the variables of beef prices, fish prices and tofu / tempeh prices do not affect the demand for beef in the city of Padang Sidempuan. The conclusions of this study indicate that the variable family income is the variable that has the most influence on the demand for beef and is followed by the variable number of dependents and the price of chicken.

Keywords: beef, consumption, demand, padang sidempuan, prices

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1. Introduction

The level of demand for beef in Indonesia is increasing from year to year, apart from being influenced by the increase in population, also due to the increase in population income, the level of knowledge of the population and the level of awareness of the importance of consuming animal protein such as meat, milk and eggs [1]. As for the condition of demand for beef in Padang Sidempuan City based on the amount of beef production is not stable. Data [2] showed that beef production were 87.96 tonnes in 2010. In 2011 there was a high increase of 255.11 tonnes and was followed in 2012 which was 307.00 tonnes. In 2013 it decreased to 95.60 tons, and was followed in 2014 and 2015, namely 91.40 tons and 49.50 tons, respectively. In 2016, there was another increase of 67.60 tonnes.

According to [3] on the development of the Padang Sidempuan City Consumer Price Index (CPI), beef inflation occurred in February at 0.012% which was the sixth largest contributor to

inflation and in June at 0.021% which was the seventh inflation contributor to several food commodities. experiencing inflation. Demand theory explains that if there is an increase in supply, there will tend to be a decrease in the price of the goods or services offered or the lower the goods, the more demand for these goods, and vice versa. The occurrence of inflation may be influenced by several reasons or factors that influence changes in consumer decisions to choose to consume beef. [4] mentioned that the factors which influence demand are the price of the goods themselves, the price of other related goods, the level of income per capita, tastes or habits, number of family members, estimated future prices, income distribution and the efforts of producers to increase sales.

Based of the fenomena of beef demand the objectives of this study was to identify the influence of factors such as beef price, family income, number of dependents, and substitute commodities, namely the price of native chicken / domestic chicken, fish, tofu / tempe on the demand for beef in Padang Sidempuan City.

2. Materials and Methods

The research area was carried out in the city of Padang Sidempuan, with the consideration that this area is one of the municipalities in North Sumatra which is one of the cities that produce and consume beef in North Sumatra which is quite high. The research location was determined purposively (purposive) in several traditional markets in the city of Padang Sidempuan. This research was conducted from August 2018 to October 2018. Determination of the location in this study was carried out purposively. The location of the study was taken intentionally or purposively, namely purposive sampling for reasons known from the characteristics of the sample [5] and there were 5 traditional markets which were researched, namely Sakumpal Bonang Market, Ucok Kodok Market, Batu Tax Market, Dalihan Natolu Market in North Padang Sidempuan District and Saroha Padangmatinggi Market in Padang Sidempuan Selatan District, with the consideration that these two markets are the largest markets. in the city of Padang Sidempuan.

The samples in this study were beef consumers. The method of determining consumer respondents was carried out by the tracing method (Accidental sampling), which was the taking of respondents from consumers who were shopping for beef. This was the easiest to get / find when data collection was carried out and the consumers were willing to be interviewed in traditional markets which were the location of the research.

The sample size of consumers in this study were taken as many as 30 samples of beef consumers in each market so that a total of 150 respondents. [6] stated that based on the sampling theory, minimum sample size were at least 30.

The method of analysis was carried out by using multiple linear analysis methods (multiple regression) with eight independent variables, namely the price of beef, income, number of dependents, the price of native chicken, fish, tofu /tempe as a substitute commodity and as the dependent variable, namely demand for beef.

Linear regression analysis is an analysis to determine the relationship between the independent variable and the dependent variable using linear equations. If there are more than one independent variable it is called multiple linear regression analysis. This analysis is to predict or predict the value of the dependent variable with changes in the independent variable [7].

This analysis uses the OLS (Ordinary Least Square) method or the least squares method with SPSS 22.0 as a tool. The form of the model can be formulated as follows:

$$Y = a + b1X1 + b2X2 + b3X3 + b4X4 + b5X5 + b6X6 + b7X7 + \mu$$

where :
Y = Total consumption of beef (kg / month)
a = intercept coefficient
b1, b2, b3 = regression coefficient
X1 = price of beef (IDR / kg)
X2 = average family income (IDR / month)
X3 = Number of dependents (soul)
X4 = Price of native chicken / domestic chicken as a substitute commodity
(Rp / Kg)
X5 = price of fish as a substitute commodity (Rp / Kg)
X6 = price of tofu / tempe as a substitute commodity (Rp / block)
μ = unconditional error

3 .Result and Discussion

3.1. Estimation of Demand Functions

Based on the results of data analysis, the beef demand function model in the city of Padang Sidempuan is as follows:

Y = 0.610 - 1,224.10-5X1 + 0.359 X2 + 0.194X3 + 1.255.10-5X4 + 5,156.10-6X5 + 4,426.10-5X6

Notes :
Y = Total consumption of beef (Kg / month)
X1 = Price of beef (Rp / Kg)

X2 = family income (IDR / month)

X3 = Number of dependents (soul)

X4 = Price of chicken meat (Rp / Kg)

X5 = Price of fish (Rp / Kg)

X6 = Price of tofu / tempe (Rp / block)

From the multiple linear regression equation above, it can be concluded that:

a. If the coefficient value of beef prices, income, total dependents, and prices for substituted goods, namely chicken, fish, and tofu / tempeh are equal to zero, then the amount of beef demand is 0.610 units.

b. The regression coefficient value for beef prices is equal to -1,224.10-5, meaning that if the beef price is increased by 1 unit, it will affect the decrease in beef demand by 1,224.10-5 units.

c. The regression coefficient value for the income variable is equal to 0.359, which means that every 1 unit increase in income will affect the increase in beef demand by 0.359 units.

d. The regression coefficient value for the number of family dependents is equal to 0.194, meaning that every increase in the number of family members is 1 unit, it will affect the increase in demand for beef by 0.194 units.

e. The regression coefficient value for the price of chicken meat as a substitute good is equal to 1,255.10-5, meaning that every 1 unit increase in the price of substituted goods will affect the increase in demand for beef by 1,255.10-5 units.

f. The regression coefficient value for the price of fish as a substitute good is equal to 5,156.10-6, meaning that every 1 unit increase in the price of substituted goods will affect the increase in demand for beef by 156.10-6 units.

g. The regression coefficient value for the price of tofu / tempe as a substitute good is 4,426.10-5, meaning that every 1 unit increase in the price of substituted goods will affect the increase in demand for beef by 4,426.10-5 units

3.2. Classic Assumption Testing

To determine whether there is a deviation from classical assumptions, a classical assumption test is carried out which includes the residual normality test, multicollinearity, and heteroscedasticity.

a. Residual Normality Test

Table 1. Residual Normality Test Results

Variabel	*KSZ*	Sig.	Conclusion
Unstandardized Residual	0,065	0,200	Normal

Based on "Table 1", it can be seen that the significance value is greater than 0.05, which is equal to 0.200. So it can be said that the residual data is normally distributed.

b. Multicollinearity test

Table 2. Multiolinearity Test Results

Variabel	*Tolerance*	VIF	Conclusion
Price of beef	0,962	1,040	No multikolinearitas
Income	0,346	2,891	No multikolinearitas
Number of dependents	0,433	2,310	No multikolinearitas
Price of chicken meat	0,626	1,598	No multikolinearitas
Price of fish	0,962	1,019	No multikolinearitas
Price of tofu / tempe	0,978	1,023	No multikolinearitas

The results of the analysis shows that each independent variable is a tolerance value> 0.1 and a VIF value <10, so it can be stated that there is no multicollinearity among the independent variables.

c.Heteroscedasticity test

Table 3. Heteroscedasticity Test Results

Variabel	*Correlation Coefficient*	*Absolut Residual*
Price of beef	-0,048	0,557
Income	0,102	0,214
Number of dependents	0,061	0,459
Price of chicken meat	0,060	0,463
Price of fish	0,123	0,134
Price of tofu / tempe	-0,012	0,887

Based on "Table 3", the decision making of the results of the heteroscedasticity test using the Spearman's rho method is that if the significance value between the independent variables and the absolute residue is more than 0.05, there is no heteroscedasticity problem, but if the significance value is less than 0.05, there is a heteroscedasticity problem.

From the table above, it can be seen that the significance value of each variable is more than 0.05, so it can be stated that in the regression model there is no heteroscedasticity problem.

3.3. Model Testing

To analyze the relationship between beef demand in Padang Sidempuan City and the variables that influence it, a multiple linear regression model is used with the OLS (Ordinary Least

Square) method. In order to obtain the best regression results, it must meet the following statistical criteria:

a. Coefficient of Determination (R2)

The coefficient of determination shows how much the percentage of the contribution of the independent variables together on the dependent variable. Based on the results of the analysis, it was obtained an adjusted R2 value of 0.666. This shows that the independent variables used in the model, namely the price of beef, income, the number of dependents, the price of chicken as a substitute, the price of fish as a substitute, and the price of tofu / tempeh as a substitute, contributed 66.6% to the demand. beef in the city of Padangsidimpuan. While the remaining 33.4% is explained by other variables outside the model.

b. F Test

The F test is used to test the effect of the independent variables together on the dependent variable. The results of the F test analysis can be seen in "Table 4".

Table 4. Results of Analysis of Variables Influencing Demand for Beef in Padang Sidempuan City

Model	TotalQuadrate	Df	Mean Quadrate	F count	Significant
Regression	31,923	6	5,320	50,461	0,000
Residue	15,077	143	0,105		
Total	47,000	149			

Source: primary data processed, 2019

Based on the F test analysis carried out, it can be seen that the F count obtained was 50.461 with a significance of F = 0.000 <0.05. This shows that the independent variables observed, namely the price of beef, income, the number of dependents, the price of chicken, the price of fish, and the price of tofu / tempeh together have a significant effect on the demand for beef in the city of Padang Sidempuan.

c.T Test

Table 5. Results of t-test analysis for each variable

Variabel	Regression Coefficient	Coefficient Standard	t count	Significant
Price of beef	$-1{,}224.\ 10^{-5}$	-0,054	-1,095	0,275
Income	0,359	0,562	8,022	0,000
Number of dependents	0,194	0,200	3,290	0,001
Price of chicken meat	$1{,}255.\ 10^{-5}$	0,175	2,861	0,005
Price of fish	$5{,}156.\ 10^{-6}$	0,015	0,313	0,755
Price of tofu / tempe	$4{,}426.\ 10^{-5}$	0,094	1,881	0,062

Source: primary data processed, 2019

Based on the t test in "Table 5", it shows that family income, number of family dependents, and the price of chicken have a partially significant effect on beef demand in Padang Sidempuan

City at the 95% confidence level. The following is an explanation of each effect of the independent variable (free) on demand for beef in the City of Padang Sidempuan.

1. Price of beef

Based on the results of the analysis, it can be seen that the partial regression coefficient of the variable price of beef is -1.224x10-5 and the t value is -1.095. The significance value of the beef price variable shows 0.275> 0.05, so it can be said that the beef price variable itself has no effect on beef demand.

The relatively fluctuating price of beef is influenced by the amount of beef available. When the amount of available beef from both inside and outside the city is abundant, so the price of beef is low, consumer demand for beef increases. Conversely, when the amount of beef availability both from inside and outside the city decreases, it will cause beef prices to rise so that consumer demand for beef decreases [8]. The results showed that the t-count of the variable price of beef obtained was -1.095> t table -1.976 and it can be stated that partially the price of beef has no effect on beef demand in Padang Sidempuan City because the price does not experience a significant increase in price.

2. Family income

Based on the analysis of the t-test results, the t-count value obtained is 8.022> t table 1.976 and the significance value of the family income variable shows 0.000 <0.05, it can be stated that the income variable has an effect on beef demand. Income is one of the determining factors in the demand for an item. The higher the income, the higher the quantity and quality of an item to be purchased and vice versa.

According to [9] income is one of the determinants in demand for an item. The law of superior goods applies if income increases, then society / consumers will increase their demand (positive income effect). For inferior goods, an increase in income will reduce the demand for that good (negative income effect).

According to [10] the relationship between income and the number of goods demanded is positive. When a person's income / society increases, it will increase the demand for an item. Lower incomes mean that in total there is little money to spend, so that people will spend less money on some and possibly most of the goods. If the demand for a good decreases when income decreases, the good is called a normal good.

3. Number of family dependents

Based on the results of the analysis, it can be seen that the partial regression coefficient value of the variable number of dependents is 0.194, which means that every increase in the number of family members is 1 unit, it will affect the increase in beef demand by 0.194 units and the t-count value of 3.290> 1.976. The significance value on the variable number of dependents shows 0.001 <0.05, so it can be said that the variable number of dependents has an effect on beef demand.

The number of dependents will affect the amount of demand for an item if there are more dependents because this is related to the adequacy of each individual's consumption needs. This was stated by [11] that demand is positively related to the number of dependents. An increase in the number of dependents / population does not automatically lead to an increase in demand.
The number of family dependents affects the amount of beef demand for consumption by a family. Basically, with the increase in the number of family dependents, the demand for food needs will increase, as well as the beef consumed will also increase

4. Price of chicken

Based on the results of the analysis, it can be seen that the partial regression coefficient of the variable price of chicken meat as a substitute item is 1.255x10-5 and the t value is 2.861. The significance value of the chicken meat price variable shows 0.005 <0.05, it can be said that the chicken meat price variable has an effect on beef demand. The partial regression coefficient shows that if the price of chicken meat increases by 1 unit, then consumer demand for beef will increase by 1.255x10-5 units.

An increase and decrease in the price of purebred chicken in the market will affect the amount of demand for beef. This is because chicken is a substitute for beef. A decrease in the price of substituted goods (chicken meat) will affect the decline in demand for beef. Consumers buy chicken if the price of purebred chicken is cheaper than beef, and vice versa. The nutritional needs of animal protein can be fulfilled by consuming chicken.

According to [12] broiler chicken meat is the most familiar meat for all levels of society to be consumed or eaten in daily life. From children, adolescents, to adults, there is no one who does not know chicken. Even in various family events that involve consumption, the presence of chicken is never forgotten.

5. Fish Prices

Based on the results of the analysis, it can be seen that the partial regression coefficient value of the variable price of fish as a substitute good is 5.156x10-6 and the t value is 0.313. The

significance value of the fish price variable shows 0.755> 0.05, so it can be said that the fish price variable has no effect on beef demand. The partial regression coefficient shows that if the price of fish increases by 1 unit, then consumer demand for beef will increase by 5.156 x10-6 units.

The variable price of fish as a substitute for beef has no effect on changes in the amount of beef. It means that the fluctuation of fish prices does not affect the demand for beef in Padang Sidempuan City.

6. Price of Tofu / Tempe

Based on the results of the analysis, it can be seen that the partial regression coefficient value of the variable price of tofu / tempe as a substitute item is 4,426x10-5 and the t value is 1.881. The significance value of the tofu / tempe price variable shows 0.062> 0.05, so it can be said that the tofu / tempe price variable has no effect on beef demand. The partial regression coefficient shows that if the price of tofu / tempe increases by 1 unit, then the consumer demand for broiler chicken meat increases by 4,426 x10-5 units.

Based on the analysis above, it can be said that the variable price of tofu / tempeh has no effect on beef demand. The increase in the price of tofu / tempe will not change the amount of beef consumption in the city of Padang Sidempuan.

4. Conclusion

Based on the results of the research and regression analysis conducted from this study, the following conclusions were obtained:

1. Based on the regression analysis, it is known that the price of beef, family income, the number of dependents, the price of chicken, the price of fish, and the price of tofu / tempeh have an effect on the demand for beef in Padang Sidempuan City.
2. Based on the partial analysis, it is known that the influencing variables are family income, number of family dependents, and the price of chicken meat. Meanwhile, the price of beef, fish prices and tofu / tempeh prices do not significantly affect the demand for beef in Padang Sidempuan City.

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