

## Consumption Pattern of Beef, Broiler, and Fish in Households in West Sumatra Province

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### Abstract

### Original Research Article

The low consumption of meat has a negative impact on the health of the population of the Province of West Sumatra. This condition is thought to be related to household consumption patterns. To reveal household meat consumption patterns, it is necessary to conduct an in-depth study using the system demand model by taking into account the characteristics of the price of goods, the price of substitute goods, household income, and adding sociodemographic characteristics in the number of household members, mother's age and housewife education. This study aims to determine the diversity of consumption patterns of beef, broiler, and household fish seen from the economic and sociodemographic aspects, explain the demand model and the factors that influence it, and calculate the elasticity of household demand for beef, broiler, and fish. This study uses the literature study method by utilizing the 2016 National Socio-Economic Survey raw data. The data used are data on expenditure and consumption patterns of the population of the Province of West Sumatra in 2016 - 2017. The results showed that fish was the most consumed type of meat. Whereas beef consumption level is still low. The function of household demand in all three meat commodities shows that household characteristics have a diverse influence on expenditure. The price of beef and broiler has a significant effect on the share of each meat expenditure. Demand price elasticity for all types of meat is inelastic. Cross price elasticity shows that the price elasticity of fish for cattle and broilers is complementary, as well as the value of beef price elasticity for broilers. The income elasticity of all types of meat has a positive sign that indicates that the three commodities are normal goods.

**Keywords:** Consumption, Meat, AIDS Model, Household, West Sumatra

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## INTRODUCTION

Food consumption behavior is one indicator to assess the level of the household economy and the national economy, and even becomes one of the indicators in determining the Human Development Index (Human Development Index). Poor households use more than 50% of their income for food consumption[1].

In addition, one indicator of the level of community welfare is the level of nutritional adequacy, which is reflected in the adequacy of calories and protein. Calorie needs are usually obtained from the consumption of staple foods (carbohydrates), while most protein needs are obtained from the consumption of animal foods such as meat, eggs, milk, and fish[2].

One effort to increase consumption of protein from livestock is to increase the contribution of livestock products in the form of meat, milk and eggs[3]. Meat is one of the animal food commodities which has contributed to the improvement of community nutrition, especially animal protein which is very much needed for the development of Indonesian human resources as a whole[4]. The demand for meat can be increased because it is influenced by an increase in population and an increase in the population's own knowledge of the importance of animal protein, so consumption patterns also change, which originally consumed more carbohydrates switched to consuming meat, eggs, milk and fish.

Especially in 2016, beef consumption is projected at 2.85 kg / year per capita population or experiencing a 10% increase from the previous year. That is, meat availability is 738,025 tons or equal to 4,341,323 live cattle. Local is predicted to supply 469,235 tons of meat, equivalent to 2,760,000 head of cattle (62%). This means that there is a need for supplies from imports of 268,790 tons, equivalent to 1,581,117 head of cattle (38%). When compared with the previous year, devisit meat has increased by 12%[5].

The increase in consumption also occurred in several provinces in Indonesia. West Sumatra Province, known as an area where people like to eat meat with a diverse menu, apparently is not included in the group of provinces whose fresh meat consumption is above the national average. It turns out that the opposite, the amount of calorie consumption and especially consumption of animal protein is still below the national consumption standard[2].

The low consumption of meat which is a source of animal protein also has a negative impact on the health of the population of the province of West Sumatra. This condition is thought to be strongly related to consumption patterns in households in West Sumatra. The behavior of household consumers in choosing and consuming food is influenced by several factors, such as the price of meat itself, other meat prices (meat substitution), income, tastes, and habits. To reveal the phenomenon of the low meat consumption patterns of households in West Sumatra Province, this study aims to determine the diversity of household meat consumption patterns, explain the system demand model and the factors that influence it, and calculate the elasticity of demand for households in West Sumatra Province.

## RESEARCH METHODS

This study uses a literature study method. The data used are raw data (row data) sourced from the 2016 National Socio-Economic Survey (Susenas) and Expenditures and Population Patterns for the Province of West Sumatra in 2016 - 2017. To answer the objectives in this study, the measured variables are as follows:

- Amount of meat (beef, broiler and fish) consumed by the household in the past week (gr/ capita/ day)
- Prices of beef, broiler and fish (Rp/ Kg)
- Household income (Rp/ Month)
- Number of household members (person/ RT)
- Mother's age (year)
- Mother education (PT & Non PT)

To answer the research objectives, the data obtained from the 2016 National Socio-Economic Survey (Susenas) data was analyzed using an analysis technique using the AIDS (Almost Ideals Demand System) model through the SAS and SPSS programs based on variable prices of beef, broiler and fish socio-demographic variables consisting of the number of household members, maternal age and education of housewives in West Sumatra Province. The system used in this case is AIDS in the form of a share of the budget: [6].

$$w_i = \alpha_i + \sum Y_{ij} \ln P_j + \beta_i \ln (y/P) \dots\dots\dots(1)$$

(i = 1, 2, ..., n)

with terms / limitations:

w<sub>i</sub> = part of expenditure to buy meat i  
 P<sub>j</sub> = price of type / commodity of meat  
 y = total meat expenditure

α<sub>i</sub>, Y<sub>ij</sub>, and β<sub>i</sub> = parameters to be estimated

P = the price index approached from the Stone index, namely:

$$\ln P^* = \sum w_j \ln P_j \dots\dots\dots(2)$$

In addition to prices and total food expenditure, a series of hypothetical household characteristics influence demand patterns. Some of the above household variables are included in the AIDS model by defining interception as a function of these variables[7,8].

$$\alpha_i = \alpha_{io} + \sum \alpha_{iv} D_{vi} \quad i = 1, 2, \dots, v \dots\dots\dots(3)$$

with the provisions/ limitations D = variable household characteristics. With the additional variable characteristic of the household, the AIDS Model becomes:

$$w_i = \alpha^*_{io} + \sum \alpha_{iv} D_{vi} + \sum Y_{ij} \ln P_j + \beta_i \ln (y/P^*) \dots\dots\dots(4)$$

The variable household characteristics referred to in this case are:

- The number of household members, which is measured by dependence on the expenditure of the household.
- The age of a housewife measured in years.
- Housewife education measured in years.

This the empirical model for analyzing the diversity of food consumption patterns, especially meat is:

$$w_i = \alpha^*_{io} + \alpha_{i1} JK + \alpha_{i2} UI + \alpha_{i3} D + \sum Y_{ij} \ln P_j + \beta_i \ln (y/P^*) + u_i \dots\dots\dots(5)$$

with terms / limitations:

w<sub>i</sub> = part of expenditure to buy meat i  
 JK = number of household members

UI = age of a housewife

PI = education for housewives

D = dummy variable namely mother's education (College or Non-College High) → PT = 1, Non PT = 0

P<sub>j</sub> = price of type / commodity of meat

P = the price index approached from the Stone index, namely:

$$\ln P^* t = \sum w_j \ln P_j$$

u<sub>i</sub> = error

## RESULTS AND DISCUSSION

### Consumption Pattern of Beef, Broiler, and Household Fish

The high and low expenditure of meat in a region or on the social strata of a particular society is related to the level of consumption of meat, the higher the level of consumption, the greater the expenditure. In the Province of West Sumatra, 3 (three) types of meat consumed by many households are beef, broiler meat and fish[2].

In the Province of West Sumatra, fish meat is the most consumed type of meat in all districts of the city. Whereas beef is consumed in all regions of the city, but its consumption level is low at 0.011 kg/ capita/ week. This is related to the level of beef prices which is much higher than other types of meat.

Analysis according to districts and cities shows that for beef, the highest consumption is found in the city of Padang Panjang (0.037 kg/ capita/ week) and the lowest in Pesisir Selatan District (0.001 kg/ capita/ week). Whereas broiler meat, the highest consumption is found in the city of Padang (0.172 kg/ capita/ week) and the lowest in the Mentawai Kepulauan District (0.045 kg/ capita/ week). While for fish meat, the highest consumption is found in the Mentawai Islands Regency (0.692 kg/ capita/ week) and the lowest in Solok Regency (0.192 kg/ capita/ week). The low level of consumption of certain types of meat is possible because the consumption of meat asked for sample households is within the past week, so that households may not consume the meat within a week if they have consumed meat of other types.

Meat is one type of food consumption whose proportion is relatively small in the structure of food consumption of the people of Indonesia, including in West Sumatra[9]. In accordance with the habits of the people and the development of the local economy, most food consumption is dominated by the need for carbohydrates such as rice and tubers. From the average food expenditure per month, the following can be seen in the table the share distribution of beef, broiler and fish consumption in the food expenditure structure[10].

**Table-1: Average Expenditure of Beef, Broiler, and Fish as well the household meat expenditure share is a month in West Sumatra**

No	Type of meat	Spending (Rp)	Expenditures Share Meat (%)
1	Cow	5.443	0,93
2	Broiler	13.129	2,25
3	Fish	36.363	6, 23

In general, the average per capita expenditure of the population of West Sumatra based on the Susenas 2017 results amounted to Rp 1,053,803.48, an increase of almost 7% compared to 2016. The population of West Sumatra spent Rp. 584,045.24 every month for various food commodities (food), or equal to 55.42% of the total expenditure a month. Based on the average household food expenditure, only 0.93% or Rp. 5,443 is set aside for consumption of beef. While for broiler consumption is 2.25% or Rp. 13,129 and the highest for fish meat consumption is 6.23% or Rp. 36,363.

The expenditure pattern can be used as a tool to assess the level of welfare (economy) of the population, with the lower portion of expenditure on food on total expenditure, the better the level of the economy of the population. As Engel's law states that the more one's income increases, the lower the share of his expenditure for food consumption.

### Demand Model and Factors that Influence It on Beef Commodities, Broiler, and Household Fish in West Sumatra Province

The estimation of the demand for household meat in West Sumatra is carried out using a system model that is the Almost Ideal Demand System (AIDS) model which is expanded by including sociodemographic variables. In this equation the share of household expenditure for certain types/ commodities of meat against total meat expenditure is the dependent variable. While the independent variables consisted of the price of the type/ commodity of meat, total meat expenditure (all types/ commodities of meat), number of household members, age of housewife, education of housewives, and regional variables.

The coefficient  $\alpha_0$  is a constant (intercept). The coefficient  $\alpha_1$  is the direction coefficient of the age of the housewife,  $\alpha_2$  is the direction coefficient of the education of the housewife,  $\alpha_3$  is the direction coefficient of the number of household members, and  $\delta_1$  is the direction coefficient of the regional variable.

The coefficient  $\gamma_{ij}$  is the direction coefficient of meat commodity  $i$  to  $j$  (each type/ commodity of meat),  $\gamma_1$  is the direction coefficient of fish meat price,  $\gamma_2$  is the direction coefficient of beef prices, and  $\gamma_3$  is the direction coefficient of chicken meat price. The coefficient  $\beta_i$  shows the change in share of meat expenditure  $i$  as a result of changes in total meat expenditure, assuming other variables are fixed.  $\beta_1$  is the direction coefficient of the proportion of expenditure on fish meat,  $\beta_2$  is the direction coefficient of the proportion of expenditure on beef, and  $\beta_3$  is the direction coefficient of the proportion of expenditure on chicken meat. Therefore, to estimate the demand function of meat in West Sumatra a calculation and analysis of the overall coefficient of meat demand estimation (aggregate) is carried out.

Statistically the request function above has been restricted in the form of homogeneity, symmetry, and adding up. The significance and magnitude of these directions can be seen in the table below:

**Table-2: Estimating Coefficients for Parameters of Meat Expenditure Share in Sumatra West Overall (Aggregate)**

Coefficient	Parameter	Type of meat		
		Cow	Broiler	Fish
Constants	$\alpha_0$	1.350*	-0.004	0.006
Household characteristics	$\alpha_1$	0.035	0.003	-0.010
	$\alpha_2$	0.004	0.00011	0.001
	$\alpha_3$	0.001	-0.001	0.003
Region	$\delta_1$	-0.014	0.001	-0.004
Price	$\gamma_1$	1.118E-08	-2.625E-11	-5.092E-11
	$\gamma_2$	-8.518E-07	8.452E-06*	8.725E-06*
	$\gamma_3$	-1.344E-05	4.787E-06*	1.015E-04*
Income	$\beta_1$	-13.102*	-0.006	0.226
	$\beta_2$	0.843	-0.901	-4.869*
	$\beta_3$	4.629	-2.637	-30.872*

#### Information

- \*significant effect at 0.05 level.
- The coefficient  $\alpha_0$  = constant (intercept),  $\alpha_1$  = age of housewife,  $\alpha_2$  = education of housewife, and  $\alpha_3$  = number of household members.
- The coefficient  $\delta_1$  = region variable.
- Coefficient  $\beta_i$  = change in share of meat expenditure  $i$  as a result of changes in total meat expenditure, assuming other variables are fixed ( $_1$  = fish,  $_2$  = beef, and  $_3$  = broiler).

The influence of housewife age on the demand for broiler chicken meat has a negative sign, meaning that the increasing age of housewives, the smaller the share of household expenditure for broiler chicken (younger housewives will increase their market share for broiler chicken meat) Meanwhile, the effect on fish and beef is positive, which means that the increasing age of housewives will also increase the share of household expenditure for consumption of fish and beef. This shows that older housewives have a preference for fish and beef, while younger housewives have a preference for broiler chicken meat. This shift in preference can be understood because younger housewives are more likely to adopt new things, in this case broiler chicken meat.

The effect of the education of housewives on all meat is positively marked, which means that the higher the education of housewives will the greater the share of household expenditure for meat consumption. Meanwhile, the number of household members does not affect the share of expenditure on beef in West Sumatra. This means that in general there is no real relationship between the number of family members and the share of expenditure on household beef. The more the number of household members should be, the greater the share of expenditure on meat. This is thought to be caused by limited household income factors. But this reality is in line with the results of the research obtained which states that the number of household members has no significant effect on the share of meat expenditure[8].

The price of beef and broiler chicken has a very significant effect on the share of each meat expenditure. The positive sign shows that even though the price of beef and broiler chicken rises, the share of expenditure on meat continues to rise. In addition, beef prices have a significant effect on the share of expenditure on broiler meat, and vice

versa (broiler meat prices have a significant effect on the share of expenditure on beef. The equally positive sign shows that if beef prices rise, the share of expenditure on meat broiler chicken rises and if the price of broiler chicken rises, then the share of expenditure on beef will also increase. This means that beef and chicken broiler are substitute goods between one another. This is in accordance with the Law of Demand which states that if the price rises, the number of items requested will decrease, and if the price drops then the number of items requested will increase.

From the data above, it turns out that overall meat prices do not affect the decrease in household expenditure share of meat. It means that in general for households in West Sumatra meat is included in basic needs. This is certainly very positive, but there are still income factors which also determine the demand for household meat.

In the AIDS model, the coefficient  $\beta_i$  is the direction coefficient of the income logarithmic value for meat types/commodities divided by the price index approached by the Stone index. Based on table 3. it is known that income has a very significant effect on the share of expenditure on fish meat and broiler chicken meat. The coefficient is negative, meaning that if income rises, then the share of expenditure on meat actually decreases. This is understandable, because with the increase in income the household has the opportunity to be able to choose other types of meat consumption, such as beef.

**Demand Elasticity for Beef, Broiler and Fish in West Sumatra**

Based on the coefficient estimation value of meat demand in West Sumatra, it can be calculated the value of elasticity of demand for household meat. The value of elasticity calculated and analyzed consists of its own price elasticity, cross price elasticity, and income elasticity. The following can be seen in the table of demand elasticity for beef, broiler and fish in West Sumatra as a whole.

**Table-3: Demand Elasticity for Beef, Broiler and Fish in West Sumatra as a whole**

No	Type of meat	Fish	Broiler	Cow	Demand Elasticity
1	Fish	0,119452	-0,05497	-0,06449	-0,87745
2	Cow	-0,05497	0,057761	-0,0028	-5,02495
3	Broiler	-0,06449	-0,0028	0,067282	-2,44354

The demand price elasticity value shows the effect of the change in the price of a commodity on the amount of demand for that commodity. The value of elasticity of price demand in the three commodities is negative, this indicates that if prices increase, the amount of consumption of the three commodities will decrease which results in the share of expenditure for the commodity falling.

The price elasticity of demand for beef and broiler chicken is inelastic which is indicated by the absolute value of elasticity that is smaller than one. This value explains that the percentage change in the amount consumed in response to price changes, is smaller than the percentage change in price. If the price of beef and broiler chicken increases by 10%, then the amount of beef and broiler chicken consumed will decrease by 50.02% for beef and 24.4% for meat.

The demand price elasticity for fish meat is inelastic which is indicated by the absolute value of elasticity that is smaller than one. This value explains that the percentage change in the amount consumed in response to price changes, is smaller than the percentage change in price. If the price of fish meat increases by 10%, then the amount of fish meat consumed will decrease by 8.77%.

**Own Price Elasticity**

Based on the previous table it is known that all the price elasticities themselves are positive with small quantities of one. This shows that the demand for meat in general in West Sumatra is inelastic. This means that the increase in meat prices does not have an overall impact on the share of expenditure for each type of meat.

Own price elasticity ranges from 0.057761 (broiler chicken meat) to 0.119452 (fish meat). The demand for broiler chicken is the least elastic, meaning that price changes have very little effect on the demand for meat. Fish meat even though the demand is inelastic, but the value of the price elasticity is relatively large. The table also shows that the price elasticity itself is greater than the cross price elasticity. The absolute value of price elasticity ranges from 0.0028 to 0.119452. This means that if the price of meat rises by 1%, the demand for meat decreases by 0.2 to 11.9%. Because the demand is inelastic, it means that in general meat is already a staple food / food item for households in West Sumatra. This reality is closely related to economic, cultural, geographical, and dietary patterns of the local community.

**Cross Price Elasticity**

The value of cross-meat price elasticity illustrates the magnitude of the change in demand for a meat commodity as a result of changes in other meat commodity prices. The value of cross elasticity with a positive sign indicates that the increase in the price of a commodity of meat will be followed by an increase in demand for other meat commodities. In this case meat is mutually substitute (substituted). While the value of cross elasticity with a negative sign indicates that the increase in the price of a commodity of meat will be followed by a decrease in demand for other meat commodities. In this case meat is complementary (complementary). The value of cross price elasticity for each meat commodity can be seen in the following table:

**Table-4: Cross Price Elasticity of Beef, Broiler, and Fish in West Sumatra**

No	Type of meat	Cross Price Elasticity		
		Fish	Cow	Broiler
1	Fish	-	-0.05845	-0.0687
2	Cow		-	-3.75402E-05
3	Broiler			-

Based on table 4. It is known that the price elasticity of fish meat against beef and broiler chicken is negative, so is the price elasticity of beef prices for broiler chicken meat. This shows that there is a complementary relationship between the two types of meat. The interpretation of the relationship of this complement is that if there is a price decrease, the number of requests for the other type of meat will increase.

### Income Elasticity

The value of household income (expenditure) elasticity in West Sumatra Province for each meat commodity can be seen in the following table:

**Table-5: Household Income Elasticity for Beef, Broiler, and Fish in West Sumatra**

No	Type of meat	Income Elasticity
1	Cow	1,004587268
2	Broiler	0,911497738
3	Fish	0,930594371

Based on the table above it is known that the value of income elasticity of all commodities has a positive value. This shows that the three commodities are normal goods, that is, if the consumer's income increases, the consumption of beef, broiler and fish will also increase.

The value of beef elasticity  $>1$  (greater than one), except fish meat and broiler chicken meat  $<1$ . This means that if household income rises by 1%, then the demand for fish meat and broiler chicken meat rises below 1%. So the demand for broiler chicken and fish is generally inelastic, which shows that fish meat and broiler chicken meat are the main commodities for households in West Sumatra.

Price elasticity and income elasticity are consumer responses to the level of demand as a result of changes in prices and income. The factors that influence price elasticity are the proximity of substitution, the proportion of income spent, and the time passed since the price changes. The closer a type of meat can substitute, the more elastic the demand for this type of meat. The greater the proportion spent on a type of meat, the more elastic the demand for this type of meat. With only a small change from the price of the meat that has a high proportion of expenditure, it will cause consumers to think again to buy this type of meat. The longer the time has passed since the price changes, the more elastic the demand for a type of meat.

## CONCLUSIONS

Based on the results of the research that has been done, then some conclusions can be taken as follows:

- Based on meat consumption patterns in households in West Sumatra Province, it is known that:
  - Fish meat is the most consumed type of meat in all districts of the city. Whereas beef is consumed in all regions of the city, but its consumption level is low at 0.011 kg/ capita/ week. This is related to the level of beef prices which is much higher than other types of meat.
  - Based on the average household food expenditure, only 0.93% or Rp. 5,443 is set aside for consumption of beef. While the highest expenditure for fish meat consumption is 6.23% or Rp. 36,363.
- The function of household demand in beef, broiler and fish commodities shows that:
  - a. Household characteristics (household age, education of the household, and number of household members) have a varied (varied) influence on the expenditure of household meat.

- Older housewives have a preference for fish and beef, while younger housewives have a preference for broiler chicken meat.
- The effect of the education of housewives on all meats is positive, meaning that the higher the education of housewives will the greater the share of household expenditure for meat consumption.
- The number of household members does not affect the share of expenditure on beef, in general there is no real relationship between the number of family members and the share of expenditure on household beef.
- b. The price of beef and broiler chicken has a very significant effect on the share of each meat expenditure. In addition, beef prices have a significant effect on the share of expenditure on broiler meat, and vice versa.
- c. Revenue has a very significant effect on the share of expenditure on fish meat and broiler chicken meat.
- The price elasticity of demand for cows, broilers and fish is inelastic.
  - Own price elasticity of all types of meat is positive with magnitude  $<1$ . This shows that demand for meat is generally inelastic. This means that the increase in meat prices does not have an overall impact on the share of expenditure for each type of meat.
  - Cross price elasticity shows that the price elasticity of fish meat to beef and broiler chicken is negative, so is the price elasticity of beef prices for broiler chicken meat. This shows that there is a complementary relationship between the two types of meat
  - The income elasticity of all types of meat has a positive sign indicating that the three commodities are normal goods.

### Suggestions

Suggestions that researchers can give to anticipate the level of redah meat consumption is by conducting an agribusiness approach in livestock business, especially beef cattle and broiler farms so that in the future it can be pursued relatively cheaper meat prices. In addition, a diversification program for livestock business is also needed by implementing integrated farming systems.

### REFERENCES

1. Soedjana TD. Perkembangan konsumsi daging dan telur ayam di Indonesia. Media Komunikasi dan Infonnasi l'angan, Agribisnis Unggas. VIII (29). 1996.
2. Jafrinur. *Perilaku Konsumen Rumahtangga dalam Menonsumsi Daging – Kasus Propinsi Sumatera Barat* [Disertasi]. Program Pascasarjana Universitas Padjadjaran. Bandung. 2006.
3. Rahardi F dan R. Hartono R. *Agribisnis Peternakan*. Penerbit Penebar Swadaya. Depok. 2003.
4. Setyono DJ, Maharani R, Rindayanti W. Konsumsi daging sapi segar konsumen rumah tangga di pasar tradisional (kasus dikelurahan Tugu Utara, kecamatan Koja, jakarta Utara). Media Peternakan. 2016 Apr 12;26(1):1-3.
5. Romualdi KB. *Swasembada Daging Sapi*. 2016. Diakses dari: <http://indonesiana.tempo.com/>
6. Fulponi L. The almost ideal demand system: An application to food and meat groups for France. Journal of Agricultural Economics. 1989 Jan;40(1):82-92.
7. Sudaryanto T, Sayuti R. Analisa Permintaan Bahan Pangan dengan Pendekatan Persamaan Sistem. Ekonomi dan Keuangan Indonesia. 1990;38(2):141-59.
8. Sayekti AA. Faktor-Faktor yang Mempengaruhi Permintaan Beberapa Bahan Pangan Penting dalam Pola Konsumsi Pangan Rumah Tangga di Indonesia. Disertasi. Bandung: Program Pascasarjana Universitas Padjadjaran. 2004.
9. Suryana S. Pengembangan usaha ternak sapi potong berorientasi agribisnis dengan pola kemitraan. Jurnal Penelitian dan Pengembangan Pertanian. 2017 Sep 27;28(1):29-37.
10. Badan Pusat Statistik Sumatera Barat. *Pola Konsumsi Makanan Penduduk Sumatera Barat*. 2018; 2016 - 2017. BPS Sumbar. Padang.