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VARIATIONS IN THE AMOUNT OF CONSUMPTION AND CHANGES IN THE BEHAVIOR OF RICE CONSUMERS IN DETERMINING THE HIGHEST RETAIL PRICE POLICY IN SOUTH SUMATRA

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Abstract

This study analyzes the variation in the amount of consumption and changes in rice consumer behavior at the income level in setting HET in South Sumatra. The aim of the research is to produce a comparison of the amount of rice consumption based on the quality of rice at the household income level and to analyze changes in consumer behavior with different income levels in consuming rice. The research uses a survey method, and chooses consumer housewives as an example (sample). The result of the analysis is that there are significant differences in the quality of Medium and Premium rice in consumer household consumption. There is a change in rice consumption behavior where the proportion of rice expenditure before setting the HET for rice is influenced by fish commodity prices, household rice supplies, area, household education and moderate income. After setting the HET for rice, consumption of rice is influenced by the price of the rice itself and the prices of several other commodities such as meat and fish. In general, there was a change in response to consumption patterns as a result of changes in expenditure before and after the HET for rice was determined.

Keywords: Rice, HET, Determination, Behavior, Variation

INTRODUCTION

Rice is a significant contributor to global food security and provides 19% of global per capita calorie intake and 27% of calorie intake in low and middle income countries (LMIC's), (Lomax, 2015) (Duncan et al., 2020). Rice is a necessity or staple food for the Indonesian population. It was clarified by Simanungkulit and Naibaho in their 2018 research which explained that in everyday life Indonesian people consume rice as a source of carbohydrates (Simanungkalit and Naibaho, 2018) Safaat et al., 2020). PUSDATIN (2019) also said that as a staple food, more than half of the world's population consumes rice, contributing more than 20% of calories.

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Based on the Center for Agricultural Data and Information Systems (2021), more than 90% of the world's rice is produced and consumed by six Asian countries (China, India, Indonesia, Bangladesh, Vietnam and Japan). China is a country with the largest total domestic consumption of rice in the world. In the 2015-2019 period, the average consumption of rice in China reached 142.91 million tons per year or 29.66% of the world's total domestic consumption of rice. The second place is occupied by India with an average domestic consumption of 98.24 million tonnes or 20.39% of total domestic consumption in the world. Indonesia ranks third in domestic consumption of rice in the world considering that more than 90% of Indonesia's population consumes rice as a staple food, which reaches 37.97 million tons or 7.88% of total world domestic consumption. Next, Bangladesh and Vietnam with an average domestic consumption of rice supplies of 35.28 million tons or 7.32% of the world's total domestic consumption of rice and 21.9 million tons or 4.54% of the world's total domestic consumption of rice. Other countries are the Philippines, Burma, Thailand, Japan and Brazil with total domestic consumption of rice below three percent each (Bergman, 2018). In national development, rice is also a strategic commodity (Akhmad 2014; Rahmasuciana et al., 2015; Wahid 2015; Zaeroni et al., 2016). The strategic value of rice is seen from two sides, namely 1) As the main food, rice must be available in sufficient quantities to meet the needs of the community and 2) As a source of income and employment for most Indonesian people, especially rural communities. Rice is also a commodity with inelastic demand, meaning that price changes do not cause a change in the amount of consumer demand and if availability decreases it will cause prices to soar so that consumers cannot afford it (Isvilanonda at al, 2008; Abidin, 2015). From a macroeconomic point of view, high rice prices will be dangerous for the Indonesian economy because it is the main commodity that generates inflation. For this reason, the government always tries to keep rice prices at a certain level that is profitable for farmers and also for consumers. Therefore, the rice price policy adopted by the government is expected to bridge the interests of farmers and consumers (Yustiningsih, 2012). According to Thuraisingham (2010) (Putri et al., 2020) price control by the government is usually applied to goods and services to maintain the availability of essential food and prevent price fluctuations when there is a shortage. (Krisnamurthi & Utami, 2022)(Aryani & Sufri, 2019) states the government is trying to control prices through price policies because it is to protect producers and farmers from experiencing losses during the main harvest. By setting the HET, the market mechanism is not so wild. When rice prices rise, consumers do not immediately switch to cheaper rice but reduce the volume of purchases Khudori (2018). In line with Khudori's statement, PERHEPI (2016) has conducted a study of Indonesian rice consumer behavior in 13 cities stating that 98% of middle-income respondents, 93% of low-income respondents and 83% of high-income respondents stated that eating rice every day is still considered important. In general, food consumption in South Sumatra for the share of food expenditure is still quite high, namely above 50% where the quality of food consumption tends not to change much and the level of diversity in food consumption is still low despite increasing in the last three years (Faharuddin et al., 2015). The difference in rice prices is thought to have caused changes in the quality and quantity of rice consumption before and after the HET rice policy. Based on the background that has been described, it is interesting to study the rice HET policy and its impact on consumer household consumption in South Sumatra.

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RESEARCH METHODS

This research was conducted in South Sumatra Province. This study uses a survey method. This study chose consumer housewives as an example (sample). The sampling carried out was non-probability sampling with a quota sampling technique. The criteria for sample housewives are housewives from non-farmer families.

The method used to answer the first research objective uses a parametric statistical test "Test of two mean values" with the following formula:

$$t = \frac{\bar{d}}{S/\sqrt{n}}$$

Where:

$$\bar{d} = \frac{\sum(x_1 - x_2)}{n}$$

$$sd = \sqrt{\frac{n\left(\sum d^2\right) - \left(\sum d\right)^2}{(n-1)}}$$

information:

db = n – 1
t = statistic test
$\bar{x}_1$ = volume of rice consumption before determination HET
$\bar{x}_2$ = rice consumption volume after determination HET
$\bar{d}$ = difference in consumption volume
$\sum d$ = Total difference in consumption volume
n = Number of samples
Sp = The combined estimated value for the population standard deviation

So the withdrawal of the hypothesis is formulated as follows:

Ho : $\mu_1 = \mu_2$
H : $\mu_1 \neq \mu_2$
$\alpha = 0{,}05$

Meanwhile, to see differences in the quality of rice consumed using the non-parametric McNemar test with the following formula:

Table 1: Frequency Table McNemar

	Test After (-)	Test before (+)
Test before (+)	A	B
Test after (-)	C	D

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Information:

Cell category A: from positive to negative
B cell category: from positive to positive
Category C cells: from negative to negative
Cell category D: from positive to negative

$$X^2 = \sum_{i=1}^{k} \frac{(0_i - E_i)^2}{Ei} = \frac{\left(A - \frac{A+D}{2}\right)^2}{\frac{A+D}{2}} + \frac{\left(D - \frac{A+D}{2}\right)^2}{\frac{A+D}{2}} = \frac{(A-D)^2}{A+D}$$

where :

0i = most cases were observed in category to-i
Ei = many cases would be expected below Ho in the category to-i
A = many cases were observed in cells A
D = many cases were observed in cells D

Significance level: α = 0,05

With the following decision rules:

$X^{2obs} > 0,05$: there is no significant change
$X^{2obs} < 0,05$: there are significant changes

Changes in consumer behavior in consuming rice in the food composition before and after the determination of the HET for rice in producer and consumer areas in South Sumatra uses the LA/AIDS demand model (Linear Approximation-Almost Ideal Demand System) and is processed using STATA 13 software with the following formula:

$$W_t = \alpha_0 + \sum_{i=1}^{n} \beta_{ij} LogP_j + \sum_{i=1}^{n} \gamma_i Log\left(\frac{x}{P*}\right) + D + u_i$$

where:

W_t = Proportion of commodity expenditure i
X = Total staple food expenditure
P_j = commodity prices j (j = 1, 2, 3,…,n)
Log P = Stone price index
$\alpha_0, \beta_{ij}, \gamma i$ = Parameter
D = Dummy Variable
u_i = Error

$$w_i = \alpha_0 + \sum_{i=1}^{n} \beta_{ij} LogP_j + \sum_{i=1}^{n} \gamma_i Log\left(\frac{x}{P*}\right) + \lambda_1 \text{LnJAKi} + \lambda_2 \text{LnPBi} + \lambda_3 \text{LnUi} + \partial_1 \text{KWi} + \partial_2 \text{EDi} + \partial_3 \text{AKLi} + \partial_4 \text{PdRi} + \partial_5 \text{PdSi} + \partial_6 \text{PdTi} + \partial_7 \text{JBrsi} + \mu$$

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where:

Wi = Proportion of output of sample commodities to-i

If W_1 = Proportion of rice commodity expenditure

If W_2 = Proportion of chicken commodity expenditure

If W_3 = Proportion of expenditure on meat commodities

If W_4 = Proportion of fish commodity expenditure

If W_5 = Proportion of egg commodity expenditure

j = 1, 2, 3,..,n (commodity groups: rice, chicken, meat, fish, eggs)

P_j = Commodity prices j (j = 1,2,…,5)

If P_1 = Price of rice

If P_2 = Price of chicken

If P_3 = Price of rmeat

If P_4 = Price of fish

If P_5 = Price of egg

x = Total Staple Food Expenditures (Rp/mouth)

JAK = Number of family members

PB = Household Rice Supply (Kg/mouth)

U = Age (year)

KW = dummy Territory

1 = Producer 0 = Consumer

EDU = education dummy Housewife

1 = SMA to the top 0 = SMP down

AKL = dummy number of male family members

1 = number of men > 3 0 = number of men < 3

PDR = Low Income dummy

1 = Low income 0 = other income

PDS = Medium Income dummy

1 = Medium income 0 = other income

PDT = High Income dummy

1 = High income 0 = other income

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$JBrs$ = dummy Type of Rice

1 = Premium 0 = Medium

$\alpha_0, \beta_{ij}, \gamma i$ = Parameter

The LA/AIDS system equation model for estimating the demand function for each commodity group is as follows:

$$\text{w\_beras} = \alpha_0 + \sum_{i=1}^{n} \beta_{ij} LogP_j + \sum_{i=1}^{n} \gamma_i Log\left(\frac{x}{P*}\right) + \lambda_1 \text{LnJAKi} + \lambda_2 \text{LnPBi} + \lambda_3 \text{LnUi} + \partial_1 \text{KWi} + \partial_2 \text{EDi} + \partial_3 \text{AKLi} + \partial_4 \text{PdRi} + \partial_5 \text{PdSi} + \partial_6 \text{PdTi} + \partial_7 \text{JBrsi} + \mu$$

$$w_{ayam} = \alpha_0 + \sum_{i=1}^{n} \beta_{ij} LogP_j + \sum_{i=1}^{n} \gamma_i Log\left(\frac{x}{P*}\right) + \lambda_1 \text{LnJAKi} + \lambda_2 \text{LnPBi} + \lambda_3 \text{LnUi} + \partial_1 \text{KWi} + \partial_2 \text{EDi} + \partial_3 \text{AKLi} + \partial_4 \text{PdRi} + \partial_5 \text{PdSi} + \partial_6 \text{PdTi} + \partial_7 \text{JBrsi} + \mu$$

$$w_{daging} = \alpha_0 + \sum_{i=1}^{n} \beta_{ij} LogP_j + \sum_{i=1}^{n} \gamma_i Log\left(\frac{x}{P*}\right) + \lambda_1 \text{LnJAKi} + \lambda_2 \text{LnPBi} + \lambda_3 \text{LnUi} + \partial_1 \text{KWi} + \partial_2 \text{EDi} + \partial_3 \text{AKLi} + \partial_4 \text{PdRi} + \partial_5 \text{PdSi} + \partial_6 \text{PdTi} + \partial_7 \text{JBrsi} + \mu$$

$$w_{ikan} = \alpha_0 + \sum_{i=1}^{n} \beta_{ij} LogP_j + \sum_{i=1}^{n} \gamma_i Log\left(\frac{x}{P*}\right) + \lambda_1 \text{LnJAKi} + \lambda_2 \text{LnPBi} + \lambda_3 \text{LnUi} + \partial_1 \text{KWi} + \partial_2 \text{EDi} + \partial_3 \text{AKLi} + \partial_4 \text{PdRi} + \partial_5 \text{PdSi} + \partial_6 \text{PdTi} + \partial_7 \text{JBrsi} + \mu$$

$$w_{telur} = \alpha_0 + \sum_{i=1}^{n} \beta_{ij} LogP_j + \sum_{i=1}^{n} \gamma_i Log\left(\frac{x}{P*}\right) + \lambda_1 \text{LnJAKi} + \lambda_2 \text{LnPBi} + \lambda_3 \text{LnUi} + \partial_1 \text{KWi} + \partial_2 \text{EDi} + \partial_3 \text{AKLi} + \partial_4 \text{PdRi} + \partial_5 \text{PdSi} + \partial_6 \text{PdTi} + \partial_7 \text{JBrsi} + \mu$$

To answer the purpose of this study, an econometric analysis was carried out, to ensure that the assumption of satisfaction maximization is not violated, then there are three restrictions that must be included in the model, namely adivity, homogeneity and symmetry restrictions.

1) Adding up

$$\sum_{i}^{k} a_i = 1 \sum_{i}^{k} \beta_i = 0 \sum_{i}^{k} \gamma_{ij} = 0$$

(2) Homogenitas

$$\sum_{i}^{k} \gamma_{ij} = 0$$

(3) Symtery

$$\gamma_{ij} = \gamma_{ji}$$

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Measurement of the response to changes in a variable is the quantity of elasticity which includes the response to changes in the demand for a commodity due to price changes (self-price elasticity), the response to changes in the demand for a commodity due to changes in the price of other commodities (cross elasticity), the response to changes in the demand for a commodity due to changes in income levels (elasticity income). Based on the model formulated above, the elasticity value based on the model is:

$$\text{own price elasticity} = \frac{\beta_{ij}}{W_1} - 1$$

$$\text{Cross elasticity} = \frac{\beta_{ij}}{W_1} + 1$$

$$\text{Income elasticity} = \frac{\gamma_i}{W_1} + 1$$

RESULT AND DISCUSSION

Differences in Rice Quality Levels in Producer and Consumer Areas Before and After the Highest Retail Price (HET)

Differences in Quality Levels before and After Determination of HET in Producing Areas

The highest retail price (HET) for food is a form of general subsidy. This is a form of market regulation established to protect society from food price inflation by setting the maximum price of a food, regardless of the actual production costs and market prices (Hashim and Sabirzyanov, 2015). With the establishment of the HET for rice, rice is classified into two types, namely medium rice and premium rice. Medium rice is a type of rice that has a minimum degree of milling specification of 95%, a maximum moisture content of 14% and a maximum of 25% broken grains. Meanwhile, premium rice is a type of rice that has specifications for a minimum degree of milling of 95%, water content of 14% and maximum broken grains of 15% (Permendag No. 57/M-DAG/PER/8/2017).

At the research locations in the producer areas, in this case East OKU Regency and OKU Regency which are rice producing areas, it was found that rice mills differentiated between medium and premium rice types not based on the rice quality classification as stipulated in the Minister of Trade regulation, to distinguish between medium and premium rice types. Premium is only done visually such as broken grain and rice color. It is this basis that underlies milling to determine the price of rice. For medium rice, the price range is IDR 8,000/kg and premium rice, IDR 9,000/kg. Meanwhile, the prevailing price in traditional markets around the study site for medium rice is Rp. 9500/kg and premium rice is Rp. 11,000/kg. This is in line with Lastinawati's research (2021) which states that village mills do not use tools to measure rice quality as set by the government. In general, rice produced by the Community Food Enterprises Institution (LUPM) does not fulfill all the rice quality parameters required in the Minister of Agriculture Regulation (Sarastuti et al, 2018).

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Hypothesis testing to see differences in the quality of medium and premium rice consumed before and after the determination of the HET for rice was carried out through the McNemar test with the results presented in Table 2.

Table 2: Results of the McNemar Test for the quality of rice purchased by consumers in producing districts

Regency	Level Income	Before	After		Significance
		Type of Rice	Medium	Premium	
OKU Timur	Low	Medium Premium	14 0	6 0	0,031**
	Currently	Medium Premium	1 2	14 3	0,004*
	Tall	Medium Premium	2 2	13 3	0,007*
OKU	Low	Medium Premium	7 0	6 7	0,031**
	Currently	Medium Premium	8 0	7 5	0,016**
	Tall	Medium Premium	2 0	7 11	0,016**

Information : * real on α = 0,01

** real on α = 0,05

From the results of the McNemar test conducted in the East OKU Regency and OKU Regency, it can be seen that the significance for each income group has a value less than 0.05, which means that there is a difference in the quality of rice consumed by consumers before and after the HET for rice is determined. In this study, the change in quality referred to is for low-income households who previously consumed medium rice to switch to consuming premium rice. Differences in quality can occur due to the determination of the HET for rice which provides guarantees to consumers so that the price of rice can be affordable by the people's purchasing power. However, not all low-income groups switch to consuming premium rice because there are several households that continue to consume medium rice after the establishment of the HET for rice. This is because these households already like the rice they consume, so even if they can afford to buy premium rice, they will not switch. Sayekti (2008) suggests that in addition to age structure factors, number of family members, education, gender, and habit factors related to socio-cultural elements, economic environment and biological needs that influence a person's choice of the type of food they consume. .

In addition, the preferences of the high-income group prefer premium rice compared to medium rice. According to Khrisnamurthi and Sawit (2017), this shift in consumer behavior has occurred over the last 10 years. There are at least two underlying changes. First, the place to buy rice, which was originally in traditional markets, has switched to modern markets (minimarkets, supermarkets, hypermarkets), and the type of rice purchased, which was originally bulk rice, has switched to packaged rice. Second, the quality and quantity of rice consumed. The quality of rice is getting better with the existence of modern rice milling units,

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but the amount of rice consumption per capita has decreased, especially in the high-income group. At the time of the research, although the place to buy rice was one of the factors underlying the shift in behavior change in consuming rice, for the East OKU region for the low and medium income groups who live in rural areas and on average they still buy rice at mills and stalls around House. Likewise with the condition of sample households located in OKU District for low and moderate income groups who are in rural areas. However, in contrast to East OKU District, the number of rice mills in OKU District is not as large as East OKU and the purchase of rice is done at traditional markets or what is commonly called circles.

The calculation results for producing areas on average have a significance value of less than 0.05 which means that consumers in producing areas have made changes to the quality of the rice they consume. The significance value is presented in Table 3.

Table 3: Results of the McNemar Test for the quality of rice purchased by consumers in producer areas

Regency	Level Income	Before	After		Significance
		Type of Rice	Medium	Premium	
Produsen	Low	Medium Premium	31 0	7 2	0,016*
	Currently	Medium Premium	19 0	11 10	0,001*
	Tall	Medium Premium	4 3	19 14	0,001*

Information: * real on α = 0,01

These traditional market rice traders do not yet have criteria for distinguishing medium and premium rice as stipulated in the Regulation of the Minister of Trade. Retailers in traditional markets only visually distinguish medium and premium rice. This is in line with research by Aryani et al (2019) which found that most traders in South Sumatra only visually assessed the types of quality medium and premium rice through broken grains and the water content felt by biting the rice. The measurement of rice quality in traditional markets is only based on self-declare. With regard to income groups, the results of the study show that in low-income households, the change in quality that occurs is that households previously consumed medium rice have switched to premium rice. This was concluded by the researchers from the results of interviews with respondents who bought rice at a price equivalent to the price category of premium rice.

Differences in Quality Levels before and After Determination of HET in Consumer Areas

Changes in quality for consumer areas on average also show the results of calculating a significance value of less than 0.05, which means there are changes in the quality of rice before and after the determination of the HET for rice, presented in Table 4.

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Table 4: Results of the McNemar Test for the quality of rice purchased by consumers in cities in the consumer's area

City	Level Income	Before	After		Significance
		Type of rice	Medium	Premium	
Palembang	Low	Medium Premium	5 0	8 7	0,008*
	Currently	Medium Premium	0 0	7 13	0,016**
	Tall	Medium Premium	2 0	6 12	0,031**
Prabumulih	Low	Medium Premium	7 0	10 3	0,002*
	Currently	Medium Premium	0 0	7 13	0,012**
	Tall	Medium Premium	2 1	8 9	0,039**

Information: * real on α = 0,01

** real on α = 0,05

The results of the McNemar test for the quality of rice in consumer areas, namely the city of Palembang and the city of Prabumulih also have a significance value of less than 0.05, which means that there is a change in the quality of rice consumed before and after the HET for rice is determined. According to Romadhon (2021), the expenditure pattern of Palembang City residents for the last 4 years for non-food expenditure is greater than expenditure for food. This shows that the welfare of the people of Palembang City has increased so that the shift in preferences from initially prioritizing quantity to quality, branded rice or certain types, in this case the attributes of rice are an important factor as a determinant of consumer preferences.

Table 5: McNemar test results for the quality of rice purchased by consumers in consumer areas

Regency	Level Income	Before	After		Significance
		Type of rice	Medium	Premium	
Konsumen	Low	Medium Premium	12 0	18 10	0,000*
	Currently	Medium Premium	1 2	14 3	0,004*
	Tall	Medium Premium	4 1	14 21	0.007*

Information: *real on α = 0,01

The significance value is presented in Table 5. On average, the calculation results for consumer areas obtain a significance value that is less than 0.05, which means that households in consumer areas have made changes to the quality of rice consumed.

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Analysis of Consumer Behavior in Consuming Rice in Food Composition Before and After the Determination of the HET for Rice in Producer and Consumer Areas in South Sumatra.

The third research objective is about changes in consumer behavior in consuming rice in food composition before and after the determination of the HET for rice in producer and consumer areas in South Sumatra. Linear Approximate Almost Ideal Demand Systemd (LA/AIDS) is the approach used in this study.

The LA/AIDS approach is a demand function that can describe consumer behavior in consuming rice in the food composition before and after the determination of the HET for rice in producing and consuming areas in South Sumatra. The AIDS model can fulfill the theory of demand if it fulfills three criteria, namely adding up, homogeneity, and symmetry.

These three constraints are the restriction equations in the Seemingly Unrelated Regression (SUR) method. Before discussing each independent variable, it can be shown that the restriction treatment of adding up, homogeneity and symmetry in the system of equations of the LA-AIDS model has been fulfilled, in detail as follows:

Table 6: Parameter Alpha dan Gamma

Before	**^{W}rice**	**^{W}chicken**	**^{w}meat**	**^{w}fish**	**^{w}egg**
Parameter Alpha	-0.589	0.142	1.808	-0.145	-0.215
Paramater Gamma	0.170	-0.021	-0.158	0.032	-0.024
After	**^{W}rice**	**^{W}chicken**	**^{w}meat**	**^{w}fish**	**^{w}egg**
Parameter Alpha	0.791	-0.098	-0.416	0.236	0.487
Paramater Gamma	0.210	0.019	-0.236	-0.004	0.012

1. Adding up: refers to the equation $\sum_{i=1}^{n} W_i = 1$,$\sum_{i=1}^{n} \alpha_i=1$,$\sum_{i=1}^{n} \gamma_{ij}=0$, dan $\sum_{i=1}^{n} \beta_i= 0$ allows the proportion of expenses to add up to one.
2. Homogenity: Each food group the total coefficient of the prices is equal to zero or when referring to the equation $\sum_{j=1}^{n} \gamma_{ij}= 0$ for each commodity. Thus, the resulting demand system is zero degree homogeneous with respect to prices and demographics, which means that if prices and demographics change in the same proportion, then the demand for a commodity will not change.
3. Symmetry: $\gamma_{ij} = \gamma_{ji}$, indicates that there is consistency in consumer choice.

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Table 7: Parameters Affecting the Proportion of Staple Food Expenditure Before the HET Rice

	^{w}rice	^{w}chicken	^{w}meat	^{w}fish	^{w}egg
lnP(Beras)	0.081	-0.075	0.480	-0.222*	-0.264
lnP(Ayam)	-0.075	0.128	-0.042	-0.021	0.010
lnP(Daging)	0.480	-0.042	-0.615	0.046	0.130
lnP(Ikan)	-0.222*	-0.021	0.046	0.164	0.034
lnP(Telur)	-0.264	0.010	0.130	0.034*	0.090
LnU	-0.047	-0.006	0.064*	0.001	-0.013
LnPB	0.058*	-0.010	-0.052*	-0.008	0.012
LnJAK	-0.023	0.021	0.084*	-0.069*	-0.013
KW	0.123*	-0.007	-0.094*	-0.004	-0.018
EDU	-0.057*	0.004	0.059*	0.000	-0.006
AKL	-0.002	-0.006	0.014	-0.006	-0.001
PDR	0.055	-0.036*	-0.062	0.009	0.034
PDS	0.096*	-0.022*	-0.070*	-0.009	0.004
JBrs	-0.028	0.000	0.004	0.026*	-0.002

Information: *real on α = 0,05

There are two LA/AIDS models that have been estimated, namely before and after the establishment of the HET for rice in producer and consumer areas in South Sumatra. In general, the consumption pattern based on the proportion of expenditure for each commodity before and after the determination of the HET for rice is slightly different. As shown in the Appendix, the coefficient of determination (R-square) is large (more than 0.50) in the rice, meat and fish commodity groups. The chicken and egg commodity model has a low coefficient of determination (less than 0.20). When viewed from the small value of the system determination coefficient on chicken and egg commodities, it shows that the variation in people's consumption of chicken and eggs is influenced by other factors besides price and demographics which have a greater influence on the variation in expenditure proportions, for example tastes. In addition, some of these low coefficients of determination are caused by the data used which is cross-sectional data.

Table 8: Parameters Affecting the Proportion of Staple Food Expenditure after the HET Rice

	^{w}rice	^{w}chicken	^{w}meat	^{w}fish	^{w}egg
lnP(Beras)	0.322*	-0.048	-0.238*	-0.084*	0.048
lnP(Ayam)	-0.048	0.156*	0.026	-0.053*	-0.081*
lnP(Daging)	-0.238*	0.026	0.308*	0.002	-0.098
lnP(Ikan)	-0.084*	-0.053*	0.002	0.141*	-0.006
lnP(Telur)	0.048	-0.081*	-0.098	-0.006	0.137
LnU	-0.063*	0.007	0.086*	-0.015	-0.015
LnPB	0.014	0.004	-0.016	-0.006	0.003
LnJAK	-0.059	-0.004	0.188*	-0.055*	-0.071*
KW	0.096*	0.007	-0.103*	0.022*	-0.023
EDU	-0.056*	0.017*	0.061*	-0.015	-0.007
AKL	0.014	-0.016*	-0.003	-0.004	0.009
PDR	0.150*	-0.036*	-0.104*	-0.018	0.007
PDS	0.113*	-0.029*	-0.082*	-0.003	0.001
JBrs	-0.034	0.007	0.037*	0.012	-0.022*

Information: *real on α = 0,05

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If we look in detail at each model, the proportion of rice expenditure before setting the HET for rice is influenced by fish commodity prices (LnPikan), household rice supply (LnPB), region (KW), housewife education (EDU) and moderate income (PDS), which is significant at the 5 percent significance level because it has a p-value of less than 0.05 as shown in Appendix 37. This condition is different from the condition after the determination of the HET for rice. The proportion of rice expenditure after the determination of the HET for rice is influenced by the price of rice itself (LnPberas), the price of meat commodities (LnPdage), the price of fish commodities (LnPikan), age (lnU), region (KW), education of housewives (EDU), low income (PDR), and moderate income (PDS), which are significant at the 5 percent level of significance. After setting the HET for rice, consumption of rice is influenced by the price of rice itself and the prices of several other commodities such as meat and fish.

In the chicken commodity, the proportion of expenditure before setting the HET for rice was influenced by low (PDR) and moderate (PDS) income, which is significant at the 5 percent significance level because it has a p-value of less than 0.05 as shown in Appendix 36. This condition is different from the condition after the stipulation of HET for rice. The proportion of chicken expenditure after setting the HET for rice is influenced by the price of the chicken itself (LnPayam), fish commodity prices (LnPikan), egg commodity prices (LnPtelur), age (LnU), number of male family members (AKL), low income (PDR) , and moderate income (PDS), which is significant at the 5 percent level of significance. After setting the HET for rice, consumption of chicken is influenced by the price of the chicken itself and the prices of several other commodities such as eggs and fish.

Then for the meat commodity, the proportion of expenditure before setting the HET for rice is influenced by household rice supply (LnPB) and demographic factors, such as age (lnU), region (KW), education of housewives (EDU), number of family members (LnJAK) and moderate income (PDS), significant at the 5 percent level of significance because it has a p-value of less than 0.05. This condition is also different from the condition after the determination of the HET for rice. The proportion of meat expenditure after setting the HET for rice is influenced by the price of rice (LnPberas), the price of own meat (LnPdage), the price of egg commodities (LnPegur), age (lnU), region (KW), education of housewives (EDU), number of family members (LnJAK), low income (PDR), medium income (PDS), and types of rice (JBrs), which are significant at the 5 percent level of significance. After setting the HET for rice, consumption of meat is influenced by the price of the meat itself and the price of rice.

Meanwhile for the fish commodity, the proportion of expenditure before setting the HET for rice was influenced by the price of rice (LnPberas), the price of rice (LnPtelur), the number of family members (LnJAK), and the type of rice (JBrs), significant at the 5 percent level of significance because it has values p is less than 0.05 as shown in the Appendix. Just like other commodities, after the determination of the HET for rice, conditions are different. The proportion of fish expenditure after setting the HET for rice is influenced by the price of rice (LnPberas), the price of chicken (LnPayam), and the price of the fish itself (LnPikan). Demographic factors that influence the proportion of fish expenditure are the number of family members (LnJAK) and area (KW). After setting the HET for rice, consumption of fish is

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influenced by the price of fish itself and the prices of several other commodities such as rice and chicken.

For the egg commodity, there are no variables that affect the proportion of participating expenditures prior to setting the HET for rice. Meanwhile, after the establishment of the HET for rice, conditions were different. The proportion of egg expenditure after setting the HET for rice is influenced by the price of chicken (LnPayam), number of family members (LnJAK) and type of rice (JBrs). After setting the HET for rice, unlike other commodities, the consumption of eggs is affected by the price of the eggs themselves. However, on the other hand the model for egg expenditure is not very good because of the low coefficient of determination.

Table 9: Expenditure Elasticity Before and After Determination of HET Rice

Commodity	Before	After
Rice	1.838	0.170
Chicken	0.806	1.281
Meat	0.724	0.810
Fish	1.689	0.922
Egg	0.677	0.896

In the next stage, it is examined how much the response to changes in food consumption before and after the determination of the HET for rice is by calculating the elasticity based on the coefficient values that have been estimated using the elasticity formula described in Chapter 3. The results of the calculation of the elasticity of expenditure show that in general there is a change in the response pattern of consumption as a result of changes in spending before and after the determination of the HET for rice. For example, for rice, the elasticity value before setting the HET for rice was 1,838 or it is an elastic good because the expenditure elasticity value is more than one. The interpretation is that when there is an increase in total food expenditure by 1%, ceteris paribus, the proportion of expenditure on rice will increase by 1.84%. This figure shows that rice was a luxury item in the period prior to the establishment of the rice HET because the change in the proportion of expenditure on rice was greater than the percentage of the increase in total food expenditure. Meanwhile, the elasticity value of rice expenditure after the determination of the HET for rice is 0.170 or the expenditure becomes inelastic because the expenditure elasticity value is less than one. The interpretation is that when there is an increase in total food expenditure by 1%, ceteris paribus, the proportion of expenditure on rice will increase by 0.170%. This figure shows that rice is a normal good in conditions after the establishment of the HET for rice because the change in the proportion of expenditure on rice is smaller than the percentage of the increase in total food expenditure. These results illustrate that the rice HET policy has an impact on rice consumption patterns.

Then for the chicken commodity, the elasticity value before setting the HET for rice was 0.806 or an inelastic good because the expenditure elasticity value was less than one. It can be interpreted that when there is an increase in total food expenditure by 1%, ceteris paribus, then the proportion of expenditure on chickens will increase by 0.806%. This figure shows that chicken was a normal item before the HET for rice was determined because the change in the proportion of expenditure on chicken was smaller than the percentage increase in total food

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expenditure. Meanwhile, the elasticity value of chicken expenditure after the determination of the HET for rice is 1,281 or it is an elastic good because the expenditure elasticity value is more than one. This value can be interpreted that when there is an increase in total food expenditure by 1%, ceteris paribus, the proportion of expenditure on rice will increase by 1,281%. This figure shows that chicken is a luxury item after the HET for rice is determined because the change in the proportion of expenditure on chicken is greater than the percentage of the increase in total food expenditure. Changes in the expenditure elasticity of chickens are the impact of the HET policy.

In the meat commodity, the elasticity value before setting the HET for rice was 0.724 or an inelastic good because the expenditure elasticity value was less than one. It can be interpreted that when there is an increase in total food expenditure by 1%, ceteris paribus, the proportion of expenditure on meat will increase by 0.724%. This figure shows that meat was a normal item before the HET for rice was determined because the change in the proportion of expenditure on meat was smaller than the percentage of the increase in total food expenditure.

Meanwhile, the elasticity value of meat expenditure after setting the HET for rice was 0.810 or an inelastic good because there was an increase in total food expenditure by 1%, ceteris paribus, so the proportion of expenditure on meat would increase by 0.810%. This figure shows that meat is also a normal good because its expenditure elasticity is less than one. It can be interpreted that meat is a normal good in conditions after the determination of the HET for rice because the change in the proportion of spending on meat is smaller than the percentage of the increase in total food expenditure.

Then for the fish commodity, the elasticity value before setting the HET for rice is 1,689 or it is an elastic item because the expenditure elasticity value is more than one. It can be interpreted that when there is an increase in total food expenditure by 1%, ceteris paribus, the proportion of expenditure on fish will increase by 1,689%. This figure shows that fish was a luxury item before the HET for rice was determined because the change in the proportion of expenditure on rice was greater than the percentage of the increase in total food expenditure.

Meanwhile, the elasticity value of fish expenditure after setting the HET for rice is 0.922 or it is an inelastic good because the expenditure elasticity value is less than one. It can be interpreted that when there is an increase in total food expenditure by 1%, ceteris paribus, the proportion of expenditure on fish will increase by 0.922%. This figure shows that fish is a normal good in conditions after the establishment of the HET for rice because the change in the proportion of expenditure on rice is smaller than the percentage of the increase in total food expenditure. Changes in the elasticity of spending on fish are the impact of the HET policy.

Just like the meat commodity, consumption of eggs also did not change before and after the establishment of the HET for rice. The elasticity value before setting the HET for rice was 0.677 or an inelastic good because the expenditure elasticity value was less than one. It can be interpreted that when there is an increase in total food expenditure by 1%, ceteris paribus, the proportion of expenditure on eggs will increase by 0.677%. This figure shows that eggs were a normal item under conditions prior to the establishment of the HET for rice because the

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change in the proportion of expenditure on eggs was smaller than the percentage of the increase in total food expenditure.

After setting the HET for rice, the elasticity value of egg expenditure is 0.896 or it is an inelastic good because the elasticity value of expenditure is less than one. When there is an increase in total food expenditure by 1%, ceteris paribus, the proportion of expenditure on eggs will increase by 0.896%. This figure shows that eggs are also a normal good in conditions after the establishment of the rice HET because the change in the proportion of expenditure on eggs is smaller than the percentage of the increase in total food expenditure.

Table 10: Own Price Elasticity Before and After Determination of HET Rice

Commodity	Before	After
Rice	-0.562	-2.410
Chicken	0.241	1.291
Meat	-1.902	-0.585
Fish	2.503	1.558
Egg	0.296	-2.222

In the results of self-price elasticity calculations, in general there is no change in the direction of the relationship between the prices of each commodity and its demand or the proportion of expenditure for each of these commodities before and after the HET for rice is determined. However, in terms of large changes in demand due to self-price, there were changes in consumption patterns before and after the establishment of the HET for rice. For example, in the table above, it can be seen that for the elasticity of rice, before setting the HET for rice, the value was -0.562, which means that when there is an increase of 1% in the price of rice, the proportion of spending on rice will decrease by 0.562%. The value of self-price elasticity for rice is in accordance with the theory of demand because it has a negative sign, where when there is an increase in the price of an item, it will reduce the demand for that item. Meanwhile, the price elasticity of rice after the determination of the HET for rice changed to -2.410, which means that when there is an increase in the price of rice by 1%, the proportion of expenditure on rice will be reduced by 2.410%. The direction of the relationship is still in accordance with the theory of demand but the magnitude becomes more than one or includes elastic goods. Meanwhile, prior to the establishment of the HET, rice had a value of less than one or was inelastic, so it was not very responsive to changes in demand.

In terms of chicken elasticity, before setting the HET for rice the value was 0.241 which means that when there is an increase in the price of chicken by 1% it will increase the proportion of expenditure on chicken by 0.241%. The value of self-price elasticity for chicken is not in accordance with demand theory because it has a positive sign, where when there is an increase in the price of an item, it will increase the demand for that item. Meanwhile, the elasticity value of chicken after setting the HET for rice changed to 1,291, which means that when there is an increase in the price of chicken by 1%, the proportion of expenditure on chicken will increase by 1,291%. The direction of the relationship is still not in accordance with the theory of demand. Before setting the HET, rice had an elasticity value of less than one or inelastic goods,

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so it was not very responsive to changes in demand. On the other hand, after setting the HET, rice had a value of more than one or elastic goods.

Then for the elasticity of meat, before setting the HET for rice the value was -1.902 which means that when there is an increase in the price of meat by 1% it will reduce the proportion of expenditure on meat by 1.902%. The value of self-price elasticity for meat is in accordance with the theory of demand because it has a negative sign, where when there is an increase in the price of an item, it will reduce the demand for that item. Meanwhile, the elasticity value of meat after setting the HET for rice changed to -0.585, which means that when there is an increase in meat prices of 1%, the proportion of expenditure on meat will decrease by 0.585%. The direction of the relationship is still in accordance with the theory of demand but the magnitude becomes less than one or includes inelastic goods. Meanwhile, before the HET setting, rice had a value of more than one or elastic goods that were responsive to changes in demand.

The value of the elasticity of fish before setting the HET for rice was 2,503, which means that when there is an increase in the price of fish by 1%, the proportion of expenditure on fish will increase by 2,503%. The value of own price elasticity for fish is not in accordance with the theory of demand because it has a positive sign, where when there is an increase in the price of an item, it will increase the demand for that item. Meanwhile, the elasticity value of fish after the determination of the HET for rice changed to 1,558, which means that when there is an increase in the price of fish by 1%, the proportion of fish expenditure will increase by 1,558%. The direction of the relationship is still not in accordance with demand theory because it has a positive sign, where when there is an increase in the price of an item, it will increase the demand for that item. Before and after the determination of the HET for rice, fish is an elastic good because its value is more than one, so it is responsive to changes in demand.

Table 11: Cross Price Elasticity before Determination of Rice HET

	Rice	Chicken	Meat	Fish	Egg
Rice	-	-0.718	0.827	-4.761	-3.624
Chicken	-0.512	-	-0.026	-0.572	0.187
Meat	1.841	-0.270	-	0.550	1.987
Fish	-1.143	-0.188	0.095	-	0.478
Egg	-1.462	0.129	0.282	0.591	-

Finally, for the elasticity of eggs, before setting the HET for rice, the value was 0.296, which means that when there is an increase in the price of eggs by 1%, it will increase the proportion of spending on eggs by 0.296%. The value of self-price elasticity for eggs is not in accordance with the theory of demand because it has a positive sign, where when there is an increase in the price of an item, it will increase the demand for that item. Meanwhile, the elasticity value of eggs after the determination of the HET for rice changed to -2.222, which means that an increase in the price of eggs by 1% will reduce the proportion of spending on eggs by 2.222%. The direction of the relationship is in accordance with the theory of demand. Prior to setting the HET rice, the elasticity value was positive, less than one or more inelastic goods, so it was not very responsive to changes in demand. On the other hand, after the HET rice price was set,

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the value was negative and more than one or more goods were elastic and responsive to changes in demand.

Table 12: Cross Price Elasticity before Setting the HET for Rice

	Rice	Chicken	Meat	Fish	Egg
Rice	-	-0.660	-0.224	-1.520	-0.451
Chicken	0.222	-	0.029	-0.954	0.733
Meat	1.669	0.144	-	0.098	0.969
Fish	0.490	-0.839	0.038	-	0.075
Egg	-0.140	-1.218	-0.067	-0.105	-

In cross-price elasticity, what will be observed is the change in demand response for each commodity as a result of changes in the prices of other commodities before and after the HET for rice is determined. For example in rice, before the establishment of HET for rice, the meat commodity was a substitute or substituted for one another because it had an elasticity value of more than zero. Meanwhile, the commodities of chicken, fish and eggs are complementary goods because they have an elasticity value of less than zero. For rice substitute goods, namely meat, when there is an increase in the price of meat, ceteris paribus, it will increase the demand or proportion of rice expenditure. Conversely, complementary goods will reduce the demand or proportion of rice expenditure. Meanwhile, after the HET for rice was determined, the commodities of chicken, meat and fish were substitutes for rice. Meanwhile, the egg commodity is a complementary good to rice.

For the chicken commodity, before the HET for rice was determined, the egg commodity was a substitute or substitute for one another because it has an elasticity value of more than zero. Meanwhile, rice, meat and fish are complementary goods because they have an elasticity value of less than zero. Meanwhile, after the HET for rice was determined, meat was a substitute for chicken. Meanwhile, rice, fish and eggs are complementary goods for chickens. Furthermore, prior to the determination of the rice HET for meat commodities, the substitute goods were rice, fish, and eggs and chicken were complementary goods. After the determination of the HET there was a change, namely chicken and fish were substitute goods for meat, then rice and eggs were complementary goods for meat.

Cross-elasticity in fish commodities, before the HET determination for rice, meat and eggs were substitutes or substitutes for each other because they had an elasticity value of more than zero. Meanwhile, rice and chicken are complementary goods because they have an elasticity value of less than zero. Conditions after the establishment of the HET for rice, only meat is a substitute for fish. Meanwhile, rice, chicken and eggs are complementary goods for fish. Finally, for the egg commodity, before the HET for rice was set, the substitutes were chicken, meat and fish. Only rice is a complementary good to eggs. After the determination of the HET for rice there was no change. Only rice is a substitute good, while chicken, meat and fish are complementary goods to eggs.

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CONCLUSION

1. There are significant differences in the quality of Medium and Premium rice in the consumption of middle and low income households and differences in the amount of consumption of Medium and Premium rice in middle and low income consumer households. This illustrates that with the establishment of HET for rice, household consumers with low income groups can consume premium rice.
2. There is a change in rice consumption behavior in which the proportion of rice expenditure before the HET for rice is determined. Changes in response to consumption patterns as a result of changes in spending before and after setting the HET for rice, the price elasticity itself does not change. but for cross-price elasticity, there is a change in demand response for each commodity as a result of changes in other commodity prices before and after the determination of the HET for rice.

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