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Consumer Characteristics and Preferences of Rice Attributes Based on the Income Levels in Palembang

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Authors' contributions

This work was carried out in collaboration among all authors. Author Yunita designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors Lifianthi and MA managed the analyses of the study. Author MA managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

The study was conducted on 150 respondents living in Palembang city that were randomly selected based on the assumptions of community groups that have high income groups (50 respondents), medium income groups (50 respondents), and low income groups (50 respondents). The purpose of the study is to describe the characteristics of consumers and analyze consumer preferences for rice attributes based on the level of household income in Palembang city. This showed that the characteristics of households from the three level groups, both from the high, medium, and low income groups are very diverse which can influence the decision to choose and buy rice to be consumed. Rice attributes include the level of rice extinction, rice retention, taste of rice, aromatic, type of rice, volume of development, head rice, broken grains, grain groats, lime grains, and color. Household consumer preferences based on the importance level of rice attributes for the very important category most selected in the high and medium income groups are the quality before the rice becomes rice, while the low income group is a resilience factor in rice.

Household consumer preferences based on the level of preference for the attribute of rice for the category of very like the most chosen in the high income group is the taste of rice, for the medium income group is rice cake and the low income group is rice and head rice.

Keywords: Characteristics; consumer preferences; rice attributes.

1. INTRODUCTION

Rice is a staple food in a densely populated country of no less than 26 countries including China, India, Pakistan, Bangladesh, Malaysia, Thailand, Vietnam and half of the world's population who consume rice. In Indonesia, rice has a level of consumption that exceeds the level of consumption of other staples such as sweet potatoes, sago, corn, with values above 1.6 kg / capita / week [1]. Indonesia's rice production is far behind demand, while the level of participation in rice consumption both in cities and villages, in Java and outside Java is quite high at 97-100 percent, this means that only 3 percent of households do not consume rice [2].

In terms of consumption, rice is an important commodity in Indonesia because most people consume rice as daily food. One of the government's policies regarding the consumption of food diversification [3]. People in areas with rice surplus and deficit have diversified food products by replacing rice with other wheatbased foods. However, although food diversification has been programmed by the government, it has not yet reached the desired target. There is no other type of food that can replace rice as a whole, so the need for rice in Indonesia will always be high. As a result, as the population grows, the need for rice in Indonesia will increase [4,5,6].

Rice consumption in South Sumatra from January to December 2018 is estimated to be around 824.29 thousand tons, lower than the rice production from January to December 2018. Thus, the surplus of rice production in South Sumatra in 2018 is estimated to be around 687.69 thousand tons. Per capita consumption uses the average per capita consumption figure per province in 2017. The average national consumption is 111.58 Kg / Capita / Year. While the population uses the projected population by mid-2018.

Individual buyers will spend their income on goods that will offer the greatest satisfaction, depending on their taste and the relative prices of goods. Those actions directly involved in obtaining, consuming and services, including the decisions processes that precede and follow these actions [7]. The assumption is that the consumer will act rationally and will maximize the overall benefit that is associated with a combination of goods and services that accompany the product [8].

The high demand and consumption of rice in the community certainly also affects the amount of consumer spending to buy food needs, bearing in mind the relatively affordable price of rice causes many people to consume rice, one of which is in Palembang city. In addition, rice is a daily consumption of the community which is a staple food for some people of Palembang City with a population in Palembang City of 1,580,517 people and with a population density reaching 3,945 people per kilo square meter [1].

The livelihoods of Palembang city residents are very diverse, so the amount of income derived from each resident varies. Therefore, household consumption will be directly affected by household income. Food consumption will be different at each level of income namely high, medium and low income. Income is also one of the important factors that influence consumer behavior in buying and consuming. Some consumers prioritize the quality of the attributes of a product. The difference in quality and price allows people to choose rice with the quality they want and the amount of consumption consumed [9]. Consumers want rice in accordance with their preferences. In purchasing rice, consumers will always pay attention to the attributes attached to rice [10]. From the description above, an interesting problem to study is how consumers' preferences are based on rice attributes to the income of people living in of Palembang city.

1.1 Problems of the Study

Based on the description, the interesting problems of the study are:

 What are the characteristics of consumers based on household income groups in of Palembang city 2. What is the consumer's preference for rice attributes based on the level of household income groups in Palembang city.

1.2 Objectives of the Study

Based on the above problem formulation, the objectives of this study are:

- 1. Describe the characteristics of consumers based on the level of household income groups in Palembang city.
- Analyzing consumer preferences for rice attributes based on the level of household income in Palembang city.

The results of this study are expected to be useful as consideration for the local government to determine policies related to rice in Palembang city.

2. RESEARCH METHODOLOGY

The study was designed by the survey method and was carried out in residential settlements in Palembang city in September 2019 on 150 respondents. The sampling method in this study used a probability sampling technique which was a sampling technique that provided equal opportunities for each element (member) of the population to be selected as a sample member. The type of probability sampling technique used is the Cluster Sampling (Area Sampling) technique. According several authors [11,12,13] cluster sampling is a regional sampling technique used to determine samples when the object to be examined or data sources is very broad. Because the sub-districts in Palembang are best or not the same, the sampling needs to use stratified random sampling based on income levels. Districts that become the sampling are Sako District, Sematang Borang District and Kalidoni District. Sako Subdistrict represents low income consumers namely RSS Griya Harapan A, Ilir Timur II Subdistrict with middle income is the BULOG Housing Complex and Kalidoni Subdistrict represents high income consumers namely PT Pusri Complex housing. The number of sample households in this study each was 50 households, bringing the total to 150 households. To obtain primary and secondary data, interviews were conducted based on the questionnaire that had been prepared.

The variables studied include household consumer preferences based on the rice attribute in several income categories of household consumers in Palembang City. To answer the first and second objectives will be described descriptively analytically.

3. RESULTS AND DISCUSSION

3.1 Profile of Respondents

The population of Palembang City is 1,623,099, which experienced an increase in the population in the previous year. The total population of Palembang City in 2016 was 1,602,071 people. This showed that the population of Palembang City has increased by 21,028 people. Characteristics of respondents taken in this study are household consumers who buy rice consisting of 3 layers, namely low, medium and high income household consumers in Palembang city. The number of respondents taken was as many as 50 people in each household document both on low, medium and high income consumers.

3.2 Characteristics of Respondents by Age

Age is one of the factors that can influence the tastes of consumers in buying rice because of the age difference between consumers. The age difference can affect the way someone thinks in influencing consumers' decision to buy rice.

3.3 Characteristics of Respondents by Genders

Gender is one of the characteristics that can influence consumers in buying rice for their daily needs. Characteristics of consumers based on genders are divided into 2 groups, male and female. Generally, gender can indicate differences in tastes and habits of consumers in buying rice. Characteristics of respondents by gender can be seen in the Table 2.

It is known that the characteristics of respondents based on gender are dominated by female, namely at low income by 90% and middle income by 66%. While for high income, it is dominated by male which is 68%.

3.4 Characteristics of Respondents by Education Level

The higher the level of education, the more extensive knowledge and information that is known and tends to have better ways of thinking in making decisions. Characteristics of respondents based on education are divided into 5 groups namely, elementary, junior high, high school, diploma and bachelor.

No	Age level	Low income		Mediur	n income	High income	
	(years)	Total	(%)	Total	(%)	Total	(%)
1	15-56	35	70	48	96	50	100
2	57-65	8	16	1	2	0	0
3	>65	7	14	1	2	0	0
Tota	al	50	100	50	100	50	100

Table 1. Distribution of respondents by age

Source : Data Monografi Desa, Year 2019

No	Genders Low Income		Medium In	come	High In	High Income		
		Number	(%)	Number	(%)	Number	(%)	
1	Male	5	10	17	34	34	68	
2	Female	45	90	33	66	16	32	
Tota		50	100	50	100	50	100	

Source : Data Monografi Desa di Wilayah Studi, 2019

Table 3. Characteristics of Respondents by Education Level
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No	Education level	n level Low income		Medi	Medium income		ome
		Number	(%)	Number	(%)	Number	(%)
1	Not go to school	1	2	0	0	0	0
2	Elemantary	5	10	0	0	0	0
3	Junior High	14	28	0	0	0	0
4	High School	24	48	5	10	8	16
5	Diploma	1	2	3	6	9	18
6	Bachelor	5	10	32	64	27	54
7	Postgraduate	0	0	10	20	6	12
Total		50	100	50	100	50	100

Table 4. Characteristics of Respondents by Work

No	Work	Low income		Medium income		High income	
		Number	(%)	Number	(%)	Number	(%)
1	Civil Servant (PNS)	0	0	22	44	0	0
2	Private Employee	0	0	0	0	0	0
3	BUMN/BUMD	0	0	28	56	33	66
4	Enterpreuner	6	12	0	0	12	24
5	Housewive	32	64	0	0	0	0
6	Others	12	24	0	0	5	10
Jum	nlah	50	100	50	100	50	100

Table 5. Characteristics of respondents by income

No	Income (months)	Low income		Medium income		High inc	ome
		Number	(%)	Number	(%)	Number	(%)
1	<1.000.000	4	8	0	0	0	0
2	1.000.001-2.500.000	33	66	0	0	0	0
3	2.500.001-5.000.000	13	26	2	4	8	16
4	5.000.001-7.500.000	0	0	20	40	10	20
5	7.500.001-10.000.000	0	0	13	26	15	30
6	>10.000.000	0	0	15	30	17	34
Tota	al	50	100	50	100	50	100

No	Rice consumption	Low income		Medium income		High income	
	(Kg)	Number	(%)	Number	(%)	Number	(%)
1	0	0	0	0	0	1	2
2	1-10	7	14	20	40	18	36
3	11-20	32	64	20	40	25	50
4	21-30	10	20	4	8	4	8
5	31-40	1	2	3	6	1	2
6	41-50	0	0	1	2	1	2
7	51-60	0	0	2	4	0	0
Jun	nlah	50	100	50	100	50	100

In low-income consumers, dominated by high school / high school education levels of 48%, while for middle and high income household consumers are dominated by undergraduate education levels of 64% and 54%. This showed that in low-income household consumers tend to be aware of the education is still low, whereas for middle and high income household consumers realize that the level of education is very important because more than half the number of existing household consumers have become bachelor and graduate.

3.5 Characateristics of Respondents by Work

Work is one of the things that can determine the preferences of consumers to choose and buy rice because work indirectly affects the household income of consumers. Characteristics of consumers based on work consist of civil servants (PNS), Private Employees, BUMN / BUMD, entrepreneurs, private employees, housewives and others.

The most dominant low income household consumers are as housewives by 64%, the medium income household consumers who dominate the most are those who work in BUMN / BUMD by 56% and the most dominant high income household consumers are those who work as a civil servant (PNS). This showed that the most dominant occupations as a whole are housewives, BUMN / BUMD and Pengawai Negeri (PNS).

3.6 Characteristics of Respondents by Income

The income can determine the quality that consumers want in buying rice. Characteristics of respondents who buy rice based on income are divided into 4 categories, namely category 1 for income less than IDR 1,000,000), second category is IDR 1,000,001-1,500,000, the third category is IDR 2,500,001 - 5,000,000, category 4 is Rp5,000.001-7,500,000, category 5 is 7,500,001-10,000,000 and category 6 is more than Rp10,000,000.

In low income household consumers, the dominating income is Rp1,000,001-2,500,000 by 66%, in medium income household consumers that is Rp 5,000,001-7,500,000 by 40%, and in high income household consumers is more from Rp 10,000,000 of 34%. This showed that household income from the three categories, both for low, medium and high income household consumers is very diverse. Household consumer income can influence consumers in buying rice because the amount of income will be taken into consideration by consumers in making a decision to choose and buy rice to be consumed. Income will affect consumers' purchasing power of rice to be consumed.

3.7 Characteristics of Respondents by Rice Comsuption

Rice consumption is the amount of rice consumed by household consumers per month to meet their daily needs. Consumption of rice consumed ranges from 1 to 60 kg per month.

In low-income household consumers, the dominant rice consumer is 11-20 kg per month with a percentage of 64%, in medium income household consumers ranging from 11-30 kg per month with a percentage of 40% and in high-income household consumers, namely between 11-20 kg per month with a percentage of more than 50%. This showed that the tendency to consume rice in amounts that are in low, medium and high income households is in the range of 11-20 kg. The need for rice consumption can also be influenced by the number of family members, if the number of family members is large, then rice consumption will be high and vice

versa, because rice is the staple food needed in daily life.

3.8 Consumer Preferences Based on Rice Attributes in Palembang City

Consumer preferences based on rice attributes consist of the level of importance, level of preference and level of performance chosen from consumers. There are 3 classes of household consumers, namely low, medium and high income household consumers.

3.9 Consumer Preferences Based on the Importance of Rice Attributes

Consumer preferences based on the level of importance of rice attributes is a level that lists the attributes of rice based on the level of importance of rice consumers in Palembang city in choosing and buying rice based on existing rice attributes. In this case there are 3 categories of rice consumers consisting of low, medium and high income household consumers.

Household consumer preferences for the attributes taken are the most chosen by consumers, when they want to buy rice for their daily needs. In buying rice, there are categories that are selected, starting from the categories that are very important, important, ordinary, not important, and very not important.

The preference of household consumers to the rice attribute for the very important category most chosen in low income households is the shelf life of rice by 25 people with a percentage of 50%, for medium income households that is the attribute of pesticide residues by 33 people with a percentage of 66% and high-income households, namely the attributes of foreign objects as many as 23 people with a percentage of 46%. This showed that the level of importance of consumers to the attributes of rice varies greatly. Low-income household consumers are more likely to choose rice resilience, while medium and high-income household consumers tend to choose quality-related matters before the rice becomes rice.

Household consumer preferences for rice attributes for the most important categories chosen in low income households are the color / white degree attribute of 30 people with a percentage of 60%, medium income households namely the head rice attribute of 29 people with a percentage of 58%, and high-income household consumers, namely the attribute of color / degree of white as many as 29 people with a percentage of 58%. This showed that there are similarities in preferences of low and high income household consumers to the rice attribute, namely color / degree of white, whereas it is different from medium income household consumers.

Household consumer preferences for the rice attribute for the most common category chosen in low-income households are 34 people with the packaging of rice with a percentage of 68%, medium income households, namely the brand rice attribute for 27 people with a percentage of 54%, and home consumers the high income ladder is the head rice attribute of 27 people with a percentage of 54%. This showed that the preferences of household consumers. low. medium and high income household consumers, for the selection of rice attributes vary greatly.

The preferences of household consumers to the attribute of rice for non-essential categories are the most widely chosen in low-income households, namely the item of the menir grain as many as 18 people with a percentage of 36%, the medium income household that is the item attribute of the menir as many as 34 people with a percentage of 68%, and the consumers Highincome households are 10 people with 25 percent. This showed that the preferences of household consumers both low, medium and high income household consumers have similarities in choosing non-essential rice attributes, namely the menu grain characteristics.

Household consumer preferences for the rice attribute for the very unimportant category are the most widely chosen in low income households, namely the foreign body attribute of 20 people with a percentage of 40%, the medium income household that is the lime grain attribute of 14 people with a percentage of 28% and highincome household consumers, namely the attributes of menir items, broken grains, lime grains and foreign objects only 2 people with a percentage of 4%, very few choose. This showed that the preferences of household consumers both low, medium and high income household consumers vary greatly in choosing the rice attributes, and the high income household consumers do not choose this category too much.

3.10 Consumer Preferences Based on the Level of Favor of Rice Attributes

Consumer preferences based on the level of preference for rice attributes is a level that lists the attributes of rice based on the level of preference of rice consumers in Palembang city in choosing and buying rice based on the existing rice attributes. In this case there are 3 categories of rice consumers consisting of low, medium and high income household consumers.

The level of preference also influences consumers to choose and buy rice. In buying rice, there are selected categories, starting from the category of very like, like, ordinary, dislike and very dislike.

Table 7. Rice consumer preferences based on the importance of rice attributes

	Low inco	me househo	old		
Rice atttribute	Very unimportant	Not important	Ordinary	Important	Very important
	%	%	%	%	%
Cooked rice	0	0	18	50	12
Durability of saving the rice	0	0	2	48	50
Rice flavor	0	0	30	40	20
Aromatic	0	0	30	42	38
Varieties/type of rice	0	4	44	42	10
Volume of progress	0	24	40	32	4
Head rice	0	2	42	18	38
Broken grain	2	28	50	20	0
Menir grain	4	36	36	24	0
Chalk grain	0	34	38	24	0
Rice color/degree white	40	0	40	60	0
Foreign object	0	30	2	12	16
Pesticide residues	32	30	14	10	14
Rice oacking	0	14	68	10	8
Rice brand	0	2	38	52	8
Medium income househol	d				
Cooked rice	2	2	8	36	52
Durability of saving the rice	0	4	24	40	32
Rice flavor	0	8	40	44	8
Aromatic	2	40	36	22	Ō
Varieties/type of rice	2	2	18	54	24
Volume of progress	2	24	34	36	4
Head rice	0	0	20	58	22
Broken grain	4	56	38	2	0
Menir grain	14	68	14	4	Ő
Chalk grain	28	62	8	2	Ő
Rice color/degree white	2	10	36	36	16
Foreign object	2	0	10	32	56
Pesticide residues	2	2	4	26	66
Rice oacking	0	4	40	42	14
Rice brand	0	4 10	4 0 54	32	4
High income household	0	10	54	52	
Cooked rice	2	0	4	52	42
Durability of saving the rice	0	6	4 16	52 54	24
Rice flavor	2	2	10	54 44	24 40
Aromatic	2	2	30	44 46	40 20
Varieties/type of rice	2 0	2 4	30 30	40 44	20 22
	2	4 6	30 42	44 42	
Volume of progress Head rice	2	6 10	42 54	42 28	8 6
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Yunita et al.; AJARR, 11(3): 16-25, 2020; Article no.AJARR.55318

Level of important									
Low income household									
Rice atttribute	Rice atttribute Very unimportant Not Ordinary Important								
		important			important				
	%	%	%	%	%				
Broken grain	4	16	36	36	8				
Menir grain	5	25	43	20	8				
Chalk grain	4	10	42	36	8				
Rice color/degree white	0	2	30	58	10				
Foreign object	4	14	6	30	46				
Pesticide residues	2	12	16	40	30				
Rice oacking	0	8	34	48	10				
Rice brand	0	4	28	54	14				

Table 8. Rice consumer preferences based on the level of favor of rice attributes

		of important	4					
Low income household Rice atttribute Very Not Ordinary Important Very								
	unimportant	important	Orumary	important	important			
	%	%	%	%	%			
Cooked rice	0	0	10	66	24			
Durability of saving the rice	0	0	20	58	24			
Rice flavor	0	0	30	58 52	18			
Aromatic	0	0	50 64	32	4			
Varieties/type of rice	0	2	22	62	4 14			
Volume of progress	0	2	66	26	4			
Head rice	0	4 2	50 50	20 24	4 24			
	0	2 28	50 62	24 10	24 0			
Broken grain	0	28 32	62 56	10	0			
Menir grain	2	32 24	50 64					
Chalk grain				10	0			
Rice color/degree white	0	4	38	48	10			
Medium Income Household	0	0	•	00	50			
Cooked rice	2	2	8	36	52			
Durability of saving the rice	0	4	24	40	32			
Rice flavor	0	8	40	44	8			
Aromatic	2	38	36	24	0			
Varieties/type of rice	2	6	18	52	22			
Volume of progress	2	24	34	36	4			
Head rice	0	2	18	58	22			
Broken grain	4	54	40	2	0			
Menir grain	14	68	12	6	0			
Chalk grain	28	62	8	2	0			
Rice color/degree white	2	10	36	36	16			
High Income Household								
Cooked rice	0	0	6	44	50			
Durability of saving the rice	0	0	18	52	30			
Rice flavor	0	0	6	40	54			
Aromatic	0	0	6	42	52			
Varieties/type of rice	0	0	48	34	18			
Volume of progress	0	2	44	48	6			
Head rice	0	6	32	32	6			
Broken grain	0	16	32	32	8			
Menir grain	0	18	26	26	10			
Chalk grain	0	19	29	29	8			
Rice color/degree white	0	6	48	48	10			

Household consumer preferences for the attribute of rice for the category of very like the most chosen in low-income households, namely the presence of rice and head rice as many as 12 people with a percentage of 24%, for medium income households namely the attribute of rice extinction as many as 26 people with a percentage of 52%, and for high income namely 27 people taste rice attributes with a percentage of 54%. This showed that there is a similarity of preferences among low and medium income household consumers to the rice attribute, which is rice loss, whereas it is different from high income household consumers who are more dependent on the rice flavor attribute.

Household consumer preferences for the rice attribute for the category of likes most chosen in low-income households, namely the extinction of rice by 33 people with a percentage of 66%, for medium income households namely the head rice attribute by 29 people with a percentage of 58%, and for income high namely the attributes of rice retention as many as 26 people with a percentage of 52%. This shows that the level of consumer preference for rice attributes in this category varies greatly.

Household consumer preferences for rice attribute for the most common category chosen in low income households are the volume of backwardness by 33 people with a percentage of 66%, for medium income households that is the attribute of the taste of rice and broken grains for 20 people with a percentage of 40%, and for high income, there are 28 people with head rice attribute with 56% percentage. This showed that the level of consumer preference for rice attributes in this category varies greatly.

The preferences of household consumers for the attribute of rice for the disliked category are the most widely chosen in low income households, namely 16 items of menir with a percentage of 32%, for medium income households namely 34 items of menir with 68%, and for high income namely attributes of menir items and lime grains for 9 people with a percentage of 18%. This showed that the level of preference for rice attributes in this category is the same, in which household consumers alike choose the item grain menu.

The preference of household consumers to the attribute of rice for the most disliked category is

the most chosen among low income household consumers, namely lime grains for 16 people with a percentage of 32%, for medium income household consumers, namely lime grain attribute for 14 people with a percentage of 28%, and for high income household consumers no one chooses the rice attribute in this category. This showed that the level of preference of household consumers of low and medium income consumers is the same, namely the attributes of rice in the form of lime grains, whereas for high income household consumers no one chooses because their consumers prefer to be in the regular, like and very like categories.

4. CONCLUSION

From the results of the study can be concluded as follows:

- 1. Characteristics of rice consumers based household income on groups in Palembang city generally have ages between 15-56 years, female gender, educated from those who do not attend school to those who have graduated from tertiary institutions, the majority work as housewives and BUMN, the income between <Rp1,000,000 up to> Rp10,000,000 per month, with an average rice consumption of 1-10 kg / month to 51-60 kg / month.
- 2. Rice attributes include the level of rice extinction, rice storage endurance, rice flavor, aromatic, type of rice, volume of development, rice head, broken grains, menir grains, lime grains and colors.
- Household consumer preferences based on the importance level of rice attributes for the very important category most selected in the high and medium income groups are the quality before the rice becomes rice, while the low income class is a resilience factor in rice.
- 4. Household consumer preferences based on the level of preference for the attribute of rice for the category of very like the most chosen in the high income group is the taste of rice, for the medium income group is rice extinction, and the low income group is rice and head rice.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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