Factors Influencing Consumers' Preference for Imported Rice in Kumasi Metropolis, Ghana

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Authors' contributions

This work was carried out in collaboration between both authors. Author MASH designed the study and managed the literature. Author DAV performed the statistical analysis of the study and wrote the first draft of the manuscript. Both authors read and approved the final manuscript.

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ABSTRACT

This study has examined the determinants of consumption of imported rice in the Kumasi Metropolis in the Ashanti Region of Ghana. Data was collected from households that were selected in the various sub-metros within the metropolis. In all 327 rice consumers were sampled and interviewed. Descriptive and inferential statistics involving the use of frequency, mean and standard deviation as well as the Probit regression model were used to analyse the data. The results revealed that age, gender, household size, income, education, and price were statistically significant. Education, gender and income influenced consumption of imported rice positively, while household size, age and price had a negative influence on consumption of imported rice. In conclusion, key factors which influence consumers' preference for imported rice are education, income and household size. It is recommended that government enact law and develop policies to regulate importation of rice into the country and also improve upon the production of rice locally.

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1. INTRODUCTION

Rice belongs to the genus *oryza,* which belongs to the tribe *oryzeae* and the family *gramineae.* The genus *oryza* involves twenty-two species out of which twenty are wild species and two are cultivated (*oryza sativa* and *oryza glaberrima*) [1]. The most broadly cultivated amongst the two species is *oryza sativa,* which are mostly cultivated in the Asian, European Union, Middle East, northern and southern America and African countries. Due to the higher outputs, the hybrid of the two cultivated species is substituting *oryza sativa* in several areas of Africa [2]. According to United States Department of Agriculture [3] rice is consumed by more than fifty percent of the population of the world. Over the years, rice has become one of the staple foods for countries in the sub-Saharan Africa, particularly West Africa where the consumption of cereals (mainly millet and sorghum) has decreased from 61% in the early 1990's to 49% while that of rice increased from 15% to 26% over the same period [4]. The production of rice in West Africa, including the poorest countries, lags well behind demand and no country in West Africa is self-sufficient [5]. Rice imports from countries such as Thailand, China, etc. have helped by supplying rice to meet the demand of consumers in Ghana. Rice is now an important staple food for Ghanaians and consumption per capita is increasing steadily. In Ghana, rice consumption has increased from 17.5 kg per annum between 1999 and 2001 to 22.6 kg per annum between 2002 and 2004 per capita. By the end of 2011, per capita consumption of rice increased to 38 kg per annum and is projected to reach 63 kg per annum by 2015 [6].

This increase has transformed rice into Ghana's most important cereal food after maize. In Ghana there is a definitive preference for imported rice over locally produced rice. Consumer preference for imported rice over the years has been influenced by the quality attributes of rice, which has increased consumption of imported rice to that of the locally produced rice. Approximately 61% of rice consumed in Ghana is imported, locally produced rice accounted for 37% of rice consumed, while food aid accounted for 2% of total rice consumed [7]. Locally produced rice is not preferred because of poor harvest handling and poor post-harvest processing. Consumer preference is determined by taste, price, convenience, kinds, and quality [8] while brand choice is dependent on the influence of the retailer and image of the brand [9].

A research publication done in Ghana by Fintrac Inc. and reviewed by the United States Agency for International Development (USAID) shows that the rice market in Ghana, as in all countries, is highly segmented by variety, degree of processing, grain quality, and sources. Based on the findings of International Rice Research Institute (IRRI) in 1987 to 1989, these quality characteristics are physio-chemical and they include aroma, nutrients and constituents of the rice (Amylose content and protein levels); head rice (shape and size of rice kernels); colour of the rice (whiteness); and the ability of the rice to absorb water during cooking(milling degree).

The degree of milling is a measure of the percent of bran removed from the brown rice kernel. Milling degree affects milling recovery and influences consumer acceptance. Apart from the amount of white rice recovered, the degree of milling influences the colour and the cooking behaviour of rice. Unmilled brown rice absorbs water poorly and does not cook as quickly as milled rice. The water absorption rate improves progressively up to about 25% milling degree after which there is very little effect. Head rice or the head rice percentage is the weight of head grain or whole kernel in the rice lot. Head rice normally includes broken kernels that are 75-80% of the whole kernel. High head rice yield is one of the most important criteria for measuring milled rice quality. Broken grain has normally only half of the value of head rice.

Whiteness is a combination of varietal physical characteristics and degree of milling. In milling, the whitening and polishing greatly affect the whiteness of the grain. During whitening, the silver skin and the bran layer of the brown rice is removed. Polishing after whitening is carried out to improve the appearance of the white rice. During polishing some of the bran particles stick to the surface of the rice that polishes and gives a shiner appearance.

Starch makes up about 90% of the dry matter content of milled rice. Starch is a polymer of glucose and amylose is a linear polymer of glucose. The amylase content of starches usually ranges from 15 to 35%. High amylose content rice shows high volume expansion (not necessarily elongation) and a high degree of

flakiness. High amylose grains cook dry, are less tender, and become hard upon cooling. In contrast, low amylose rice cooks moist and sticky. Intermediate amylose rice is preferred in most rice growing areas of the world, except where low amylose japonicas are grown.

According to Boansi et al. [10] in a competitive market it is ensured that new products conform to the requirement of the customer before it is accepted. It can therefore be concluded that the consumers should be at the forefront of the farm producer's concerns of the farm product, which in this case is rice, ensuring the satisfaction of the consumer's preference [11].

An observation on the consumer's rice preference of rice of the residents in Municipal shows that almost all the residents take in more imported rice than local rice. It was observed that only a few shops in the markets had locally produced rice in the municipality. There has been a high demand and subsequent supply of different brands of imported rice in the various markets in the municipality. Retailers and shop owners complained of low demand for locally produced rice by consumers. In this modern day of an increasingly competitive market for farm products, the most important desire and strategy of every agriculture producing firm or organization is to make a profit, satisfy consumers and add to the development and growth of the economy. No matter how small or expanded an agricultural rice producing firm is, certain conditions and strategies such as customer satisfaction, service quality, customer retention and socio-economic factors, which affect the choice of the consumer, defines the performance of the rice producing firm in any given locality. Paying careful attention to the strategies and conditions listed above, we can infer that consumer satisfaction should be of most concern to the producer of the farm product. Producers do not only produce for a market but their product should satisfy the needs of the consumers. The climatic conditions in Ghana are good for rice production; however, consumers tend to have a greater preference for imported rice. Consequentially, to improve the consumption of local rice, there is the need to change consumers' preference for rice. Hence, the study seeks to evaluate factors influencing consumer preference for imported rice.

2. LITERATURE REVIEW

Glover and Reganold [12] stated in their work that rice belongs to the grain or grass family (poaceae). Out of the twenty-two identifiable rice species, two species are cultivated (*Oryza glaberrima* cultivated in West Africa and *Oryza sativa* cultivated in the other parts of the world). *Oryza sativa* was derived from the wild species *Oryza nivara* in the north eastern and eastern areas of India, northern Southeast Asia and southern China and was farmed between the years of 15,000 and 10,000 BC. *Oryza glaberrima* was likewise domesticated from *Oryza barthii.*

According to Baker [13] rice can be grouped into short, medium and long grain. It can similarly be grouped into two: Japonicas and Indicas. He observed that the two cannot be easily crossed hence it is possible that they separated in the initial centuries of farming. The Japonica types are known as short grains and are characterized by the degree of stickiness when cooked, while the Indica, also known as long grain, is characterized by its dryness when cooked. He further indicated that the above cooking quality is determined by the percentage of starch components including amylo pectin and Amylose. If the percentage is low the rice will be soft and tacky and when high the rice will be hard and frothy.

Glover and Reganold [12] found that rice consists of nutrients such as carbohydrate, minerals, vitamins and a proportion of protein, fibre and lipids. According to Takahashi [14] an enormous amount of *O. sativa* cultivars has been established through periods of domestication. The International Rice Gene Bank holds around 100 000 diverse rice selections most of which are *O. sativa*.

According to Wales et al. [15] rice is a very adjustable crop whose key restrictive factor is its water requirement that has been projected at 9000 m^3 per hectare of paddy in Iran. This explains the fact that most temperate regions such as Western Asia, where rice is grown during dry summer period, meets the temperature requirement of rice. Rice is taken as liquid as well as solid foods.

United States Department of Agriculture [3] indicated that approximately fifty percent of the yearly U.S. rice crop is used locally. The United States per capita rice intake is 24 pounds per annum. About half of the crop is traded to consumers around the world. The U.S. rice industry classically supplies between 50,000 to 90,000 metric tons of rice each year for food aid

programs, which plays an important role in humanitarian food assistance around the world.

Rice production in Sri Lankan has attained notable progress after independence owing to high input use, high-tech development, and extension of the land area, input supports and policy supports. The average output has reached 4.2 mt/ha while the yearly per capita intake is 110 kg.

According to Seck et al. [16] there has been an argument that rice development has possibly been the best driver of development; the engine for growth and poverty reduction. Rupasena and Vijayakumar [17] indicated that Sri Lankan had experienced a lot of structural alterations owing to poverty decline, development of the middle class and urbanization that changed their food preference. Tongo [18] said that more than 90% of rice was consumed in Asia where it is a staple for the majority of the population, including the region's 560 million hungry people. Outside Asia, rice consumption continues to rise steadily, with the fastest growth in sub Saharan Africa. In the past two decades, per capita rice consumption in sub-Saharan Africa (SSA) has increased by more than 50% [19].

The demand for rice is reliant on the accessibility or shortage of further staples such as yam, maize, cassava etc. [20]. According to Wales et al. [15], consumption of farm produce such as rice is influenced by consumer's income, age, and household size. Growing incomes diminish rice demand in some Asian countries where rice is measured as an inferior good. Demographic trends deteriorate rice demand as aging populations and cumulative health consciousness shift preferences away from carbohydrates and towards protein-based diets. About 70% of the entire global rice consumption is accounted for by China, India, Indonesia, Bangladesh, and Vietnam over the baseline period. World total rice consumption has been enlarged by 54.8 mmt (net), with 54.2% coming from the same group of the above five countries; and 6.1% was accounted for by the Philippines and Pakistan. Over the baseline era, world rice yield rose at 1.00% per year with 0.80% from yield enhancement and 0.20% from growth in the area reaped. Determined solely by population growth, global rice consumption increases by 1.06% annually as per capita use remains flat. Net trade endures to grow at 2.54% per year. International rice prices are anticipated to be flat or deteriorate to some extent as self-sufficiency in rice and the use of high-yielding crossbreeds

and further enhanced invention technology counting crossbreeds are adopted. A blend of sluggish growth in consumption and somewhat advanced growth in output are anticipated to increase ending stocks and reduce price over the baseline period.

Over the same period, India and China persist as the biggest rice economies; when pooled they account for 46% of global rice area harvested, 51% of total milled production, and 50% of total consumption. Indonesia, Bangladesh, and Thailand together account for 12% of world area harvested while Indonesia, Bangladesh and Vietnam combined account for 21% of total milled production and 20% of total consumption.

According to Asuming-Brempong and Osei-Asare [7] rice consumption over the years has increased drastically. Per capita consumption of rice in Ghana increased from 17.5% per annum between 1999 and 2001 to 22.6 kg per annum between 2002 and 2004.By 2011 it had reached 38 kg per annum and was projected to reach 63% per annum by 2015. Some factors identify to influence consumer's preference for imported rice include: the price of imported rice, aroma and income levels of consumers and people's knowledge in the nutritional content of rice.

During the year 2000 to 2003, rice consumption per annum increased by 61% and only 2% was from domestic sources [7]. The share of local rice in overall quantities of rice consumed in Ghana has steadily declined over the past two decades. In 1998 the market share of local rice was 88%; and by 2003, the market share of locally produced rice was only 24%.This shows the gradual shift in consumer preference for rice brands in the Ghanaian market. Ghanaians do not patronize local rice because they feel it is inferior to the imported rice.

A survey revealed that consumers make decisions by allocating their limited resources across all probable commodities in order to attain the maximum satisfaction. Officially, it is being said that consumers maximize their utility subject to budget restraints. Utility is the satisfaction that a consumer derives from the consumption of a good. As noted above, utility is determined by a mass of non-economic factors. Consumer value is measured in terms of the relative utilities between goods.

These reflect the consumer's preferences, which are defined as the subjective under utility theory for example taste of different bundles of

commodities. They authorize the consumer to grade these bundles of commodities according to the level of utility they present to the consumer. It was further noted that preferences are autonomous of income and prices. The capacity to acquire commodities does not decide a consumer's likes or dislikes. Greenleaf and Lehmann [21] stated that consumers encounter a phenomenon that entails choosing amongst numerous alternatives in the marketplace. The traditional focus in the decision-making literature has been on understanding how people choose among a given set of alternatives. They further stated that, in reality, many decisions concerning choice among numerous pleasing alternatives can be complicated and give way to a more basic kind of preference: the decision whether or not to choose. Their recent analysis of a sample of consumers finds that the difficulty of selecting a single alternative was one of the most important causes for delaying a number of purchase decisions.

According to Balamurugan and Balasubramanian [22] uncertainty of determining the most preferred alternative plays no role in the rational theory of choice, which assumes that, prior to choice, the vector of attributes is reduced to a scalar value "utility". In contrast, a number of other researchers argue that defensive avoidance is a likely response to difficult choices. Consumer preference for a particular brand of rice depended on the quality characteristics of that particular brand. The rice quality characteristics that consumers looked out for were aroma, taste, cooking quality, source of rice, impurities (presence of foreign matter), cooking time and price.

3. METHODOLOGY

3.1 Study Area (Location)

A total size of 1800 households were identified in the study area based on the above population, and sample size was estimated using the estimation method given by [23] as:

$$n = \frac{N}{1 + N(e)^2}$$

Where n is the sample size; e = error level; e = 1 – confidence level and N is the sample frame, which is equal to 1800. Assuming 95% confidence level, with e = 0.05, based on the above formula the sample size equals 327. The sample was proportionally distributed among the sub-metros where the data was sourced. A questionnaire was administered to the sampled household heads. The survey questionnaire contained detailed sections on demographic and socioeconomic characteristics of the respondents and issues related to consumption of locally produced and imported rice.

3.2 Conceptual and Analytical Framework

Descriptive statistics are used to identify and list the demographic characteristics of the consumers. The study used the Probit regression model to identify and evaluate factors that influence the consumption of imported rice in the Kumasi Metropolis. Rice is one of the stable foods in Ghana, hence most Ghanaian consume rice; however, their preference may vary between locally produced rice and imported rice. Thus, individual's rice consumption may either prefer imported rice or locally produced rice which may be influenced by a number of factors.

This may result in a binary dependent variable being either preference for locally produced rice or important rice. The framework for analysing this type of phenomenon where the dependent variable is a binary has its roots in a threshold theory of decision making. According to this theory, preference for local or imported rice may be arrived at only after the strength of a stimulus increases beyond the individual's reaction threshold [24]. Therefore the consumer faces a choice between imported rice or locally produced rice at a reaction threshold that yields a binary dependent variable y_i that takes on the value of one (1) if the consumer preferred imported rice and a value of zero if the consumer preferred locally produced rice. This decision is influenced by several factors x_i. The probability of observing the value of 1 is:

$$P_r\left(y_i = \frac{1}{x_i\beta_i}\right) = F(-x_i\beta_i) \qquad (1)$$

Where F is a cumulative distribution function, it is a continuous, strictly increasing function that takes a real value and return a value, which ranges from 0 and 1. The probability of observing the zeros is:

$$P_r\left(y_i = \frac{0}{x_i\beta_i}\right) = 1 - F(-x_i\beta_i) \qquad (2)$$

Given such specification, a maximum likelihood estimate is used to estimate the parameters of the model. The dependent variable is the unobserved latent variable that is linearly related to y_i by the equation:

$$y_i = \beta_i x_i + \mu_i \tag{3}$$

Where μ_i is a random disturbance term. The observed dependent variable is determined by whether y_i exceeds a threshold value or otherwise and this is given as:

$$y_i = \begin{cases} 1 \ if \ y_i^* > 0 \\ 0 \ if \ y_i^* \leq 0 \end{cases} \tag{4}$$

Where y_i^* the threshold is value for y_i and is assumed to be normally distributed. They include Linear Probability Model (LPM), and could be used to estimate parameters; however, the LPM is deficient because the probability does not always lie between zero and one [25]. Thus the logit and probit models may be used to estimate the parameters. According to Johnston and [26] the difference between logit and probit is rarely large to discriminate between them because both seem to produce similar result, which mean either probit or logit model is appropriate.

This study has adopted the probit model partly because of its ability to constrain the utility value within 0 and 1 and its ability to solve the problem of heteroscedasticity. Following from the report of [27] the probit model adopted for the study is specified as:

$$P_i = P(y_i^* < y_i) \tag{5}$$

$$P_i = P(y_i^* < \beta_0 + \beta_i x_{ij}) = F(y_i) \tag{6}$$

$$P_i = F(y_i) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{z_i} e^{\frac{S^2}{2}} ds \tag{7}$$

Where P_i is the probability that aconsumer will exhibit a preference for a particular brand of rice or the probability that a consumer would prefer imported rice as compared to locally produced rice; S is a random variable normally distributed with a mean zero, and unit variance y_i is the dependent variable (preference for a rice brand); y_i^* is the threshold value of the dependent variable. To obtain an estimate of the index Z_i, the inverse of the cumulative normal function is used and given as:

$$y_i = F^{-1}(P_i) = \beta_0 + \beta_i x_i + \mu_i \tag{8}$$

The parameters $\beta_0 \ and \ \beta_i$ of the probit model do not provide direct information about the effect of the changes in the explanatory variable and the probability of the preference. The relative effect of each explanatory variable on the likelihood that a consumer will prefer imported rice is given by:

$$\frac{\partial P_i}{\partial x_{ij}} = \beta_{ij} * f(Z_i) \tag{9}$$

Where P_i is the mean dependent variable whose value is given in the probit result as:

$$f(Z_i) = F^{-1}(P_i) \tag{10}$$

The elasticity of the predicted probability is then computed as:

$$\frac{\partial P_i}{\partial x_{ij}} = \beta_{ij} * f(Z_i) * \frac{\bar{x}}{P_i} \tag{11}$$

The empirical model is specified as:

$$CUNRICE = \alpha + \beta_1 EDU_1 + \beta_2 AGE_2 + \beta_3 HSIZ_3 + \beta_4 ICOM_4 + \beta_5 NUTRI_5 + \beta_6 PRICE_6 + +\beta_7 MRT_7 + \beta_8 GEN_8 + +\varepsilon \tag{12}$$

Where $CUNRICE$ is the dependent variable specified as a dummy variable, which has a value of 1 if the respondent prefers, imported rice and 0 otherwise. The table below presents the description of the independent variables and their expected signs.

4. RESULTS AND DISCUSSION

4.1 The Socioeconomic Characteristics of the Respondents

The results in Table 2 show that the ages ranging from 26-35 recorded the highest frequency of the respondents interviewed. The subsequent modal age group lay between the ranges of 15-25 and 36-45 years. The age range from 46 and above recorded the low frequency in the age distribution. The reason for these results might be that the municipality is highly dominated by middle youth, followed by late youth and then the early youth age. On the other hand, the low frequency recorded was mainly non-youth. This result is in agreement with [28] that recorded the population percentage of youth being 77% and the population percentage of the non-youth being 23%.

Table 2 shows that the highly dominated gender in the municipality is female with a percentage of 53% and that of the males being 47%. These figures are in accordance with [28] that recorded

Table 1. Variables and their description

Independent variable	Variable description	Expected sign
EDU	Number of years spent in formal education	+
AGE	Age of respondent at the time of data collection in years	+
HSIZ	Number of individuals making up the household	-
ICOM	Total income of the respondent in Ghana Cedis	+
NUTRI	Nutritional knowledge if high =1 and if low =0	-
PRICE	Price of the rice	-
MRT	If the respondents is married it takes the value of 1 and if not married it takes value of 0	+
GEN	Gender of the respondent Male=1 and Female=0	+/-

52.5% of the population being females and the other portion being males. Table 2 shows the distribution of educational levels of the respondents in the municipality. It recorded basic education level being the educational level with the highest frequency of 45% and the least frequency being 'not educated' at 5%. These results depict a higher number of the respondents completing education at the basic level. The frequency distribution of marital status revealed that 57% of the respondents are married while 3% are divorced.

With respect to household size, the highest frequency was 37 representing the household sizes between 4-6 persons per house. This is in line the Kumasi Metropolitan Assembly (2018) recording an average household size of 3.96. The distribution of income per month of the respondents recorded the highest frequency of 65 representing the income size between 50-250 Ghana Cedis.

The occupational status of the respondents in the municipality is another factor, which was considered. It recorded the highest frequency with civil servant at 33%, with the lowest frequency being farming. Civil servant being the highest occupation explains the cosmopolitan nature of the Metropolis and the educational level of the respondents.

4.2 Consumers' Preference for Imported Rice

Table 3 presents the results of the estimated co-efficient of the probit regression showing variables that were important for determining consumers' preference for important rice in the study area. The result shows that the model is robust with a Log pseudo likelihood value of -30.741794 when all coefficients are zero. The result from our estimation clearly suggests that the model, as a whole, is significant since the calculated LR-Chi2 is significant at 1 percent (Prob> chi2 = 0.0000).

This section analyses the factors using the probit model. From Table 3, the coefficient of education is significant at 1% level and has a positive effect on the consumer preference for imported rice. This suggests that, as the level of education of an individual increases; there is a probability that the preference for imported rice will increase. A marginal effect of 0.0513 indicates that, as the level of education increase by 1 unit, the preference for imported rice increases by 5.13%.

Age also has a negative influence on the probability that a consumer prefers imported rice and is significant at 5% level. This implies that, as one grows older, the likelihood of preferring imported rice decreases, and the likelihood increases by 0.050 units with additional unit increase in age. Thus, based on the marginal effect as a consumer's age increases by a unit (1 year), the probability of the consumer preferring imported rice will increases by 0.5%. This suggests that consumers are more conscious of their health as they grow older and would want to reduce the consumption of imported rice for health reasons. This result is in line with [29] findings on the factors affecting consumers' decisions to shop at stores offering imported rice brands.

The household size variable is significant at 1% level and has its expected negative sign. Thus household size influences consumers' preference for imported rice negatively. This suggests that the larger the consumer's household size, the lower the likelihood of the consumer to prefer imported rice. This further explains that consumers with larger household size prefer larger quantities of rice to be able to feed their large families.

Table 2. The statistics of the socioeconomic characteristics of the residents in the municipality

Characteristics	Sub-level	Frequency	Percentage
Age	15-25	69	21.0
	26-35	95	29.0
	36-45	88	27.0
	46-55	46	14.0
	>5	29	9.0
	Total	327	100.0
Gender	Males	154	47.0
	Females	173	53.3
	Total	327	100.0
Education	Basic education	160	49.0
	S.H.S	98	30.0
	Tertiary	52	16.0
	Not educated	16	5.0
	Total	327	100.0
Marital Status	Single	114	35.0
	Married	186	57.0
	Widowed	16	5.0
	Divorced	10	3.0
	Total	327	100.0
Household Size	1-3	105	32.0
	4-6	121	37.0
	7-9	82	25.0
	10-12	16	5.0
	13-15	3	1.0
	Total	327	100.0
Monthly Income	50-250	219	67.0
	251-450	47	14.4
	451-650	27	8.2
	651-850	10	3.1
	851-1050	20	6.2
	>1050	3	1.0
	Total	327	100.0
Occupation	Civil service	108	33.0
	Artisanship	101	28.0
	Farming	26	8.0
	Others	92	28.0
	Total	327	100

Field survey data, 2019

The coefficient of income is significant at 1% and has a positive influence on a consumer's preference for imported rice. This suggests that, as a consumer's income increases, there is a likelihood of that consumer will prefer imported rice. A marginal effect of 0.5137 indicates that, as consumer's income increases by one unit (GHC1.00), there is a probability that consumption of imported rice increases by 51.3%.

The coefficient of price is significant at 10% level and has a negative relationship with the consumer preference for imported rice. This suggests that the as price levels increases there is the likelihood that a consumer will reduce his or her preference for imported rice to decrease. A marginal effect of -0.0514 indicates that, as the price level increases by 1 unit, the preference for imported rice decreases by 5.14%. The coefficient for gender is significant at 10% level and has a positive influence on consumer preference for imported rice. This implies that females are more likely to consume imported rice than males and the likelihood of a female consuming imported rice increases by 7.34%.

Table 3. Factors influencing the consumers' preference for imported rice

Variables	Coefficients	Z	P>|Z|	Dy/dx
Education	2.3451***	2.8700	0.0040	0.0510
Age	-0.2628**	-2.0700	0.0390	-0.0500
Household size	-0.1591***	-2.6600	0.0080	-0.6250
Income	0.0074***	4.0100	0.0000	0.5130
Nutritional knowledge	0.2624	0.7100	0.4760	0.3960
Price	- 0.6748*	-1.6500	0.0980	-0.0510
Marital status	0.3319	0.6400	0.5190	0.0170
Gender	0.6134*	1.8400	0.0660	0.0730
Constant	1.0009	0.3900	0.6970	-
Pseudo R^2		0.5065		
Number of observation		327.0000		
Log pseudo likelihood		-30.7417		
Prob> chi2 =		0.0000		

NB: Stars denote significance at *** $p<0.01$, ** $p<0.05$, * $p<0.10$ level; p-values for t-test in parentheses. Source: Computed from field survey data, 2019

5. CONCLUSIONS AND RECOMMENDATIONS

The main aim of the study was to evaluate the determinants of consumer preference for imported rice. The result revealed that 98.0% of the respondents interviewed were consuming imported rice. These results depict a positive influence on the consumption of imported rice. A perception of imported rice consumers was that it was the only type of rice available for consumption. Another perception was that imported rice was the best rice type for consumption due to the qualities they perceive imported rice to possess. The 2%, on the other hand, expressed the perception that imported rice was of less nutritive value. From the survey it can be suggested that imported rice is preferred by consumers but nutritive value can be a limiting factor, but with a lower degree of influence.

The factors influencing preference for imported rice by consumers were examined using the probit model with the maximum likelihood estimation approach. Among the eight variables included into the probit model, six were significant, namely age; gender; household size; income; education; and price. Age is significant at 5% level; education, household size and income were all significant at 10%; while gender and prices are significant at 1% level. Education, gender and income influence consumers' preference positively while household size, price and age have a negative influence on consumers' preference. The survey suggests that education, females, higher income, smaller household size, low price, and age are more likely to cause consumers to prefer imported rice.

Factors like nutritional knowledge and marital status are not significant in influencing consumers' preferences for imported rice, thus the likelihood of a consumer preferring imported rice is not dependent on the consumers' nutritional knowledge and marital status. Considering the results on demographic characteristics of the respondents, it can be suggested that education on the consumption of local rice should be targeted at the younger residents (youth). Based on the results from the qualities of the specific brands mostly preferred, it is suggested that rice with qualities such as no foreign material, perfumed, good cooking qualities and with high expansion ratio are mostly preferred and therefore these qualities can be inculcated into our local rice to increase consumption.

Consumer preference for imported rice was dependent on factors such as income, household size, price and educational level; hence these factors should be considered in the process of ensuring increment in local rice consumption. Future studies aimed at increasing local rice consumption should examine the factors, which influence use of imported and local rice by restaurants and hotels in Ghana.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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