International Scholars Journals

Global Journal of Food and Agricultural Sciences ISSN 2756-3448 Vol. 11 (1), pp. 001-005, December, 2024. Available online at www.internationalscholarsjournals.org © International Scholars Journals

Full Length Research Paper

Factors influencing urban households' food needs in Minna Metropolis, Niger State, Nigeria

Uzoma and Kawu

Instituto Bayero University, Kano, Nigeria.

Accepted 5 December, 2024

Spawn Rice, yam, and cowpea are examples of agricultural items that are important to urban inhabitants' diets. However, Nigerian urban food prices are still in danger due to rising agricultural production costs. The factors influencing urban families' demand for food commodities in Minna city were examined in this study. 110 heads of households in metropolitan areas who were chosen using a three-stage random sample method provided the data. The multiple regression technique was used to evaluate the data gathered for the investigation. The findings demonstrated the price inelasticity of cowpea, yam, and rice. Cowpea, yam, and rice had cross-price elasticities of 0.005, 0.028, and -0.132, respectively. The calculated income elasticity of demand, cross price, and own price for rice were 0.018, -0.132, and -0.308, respectively. The calculated values for yam were -1.262, 0.028, and 0.289, in that order. These values, however, were -0.530, 0.005, and 0.002 for cowpea, respectively. Yam was found to be a luxury product for income elasticity, while rice and cowpea were shown to be typical goods. To reduce the inflationary pressure on food products in metropolitan areas, the food aids program and other social protection measures should be implemented.

Key words: Analysis, Food, demand, Urban, Households.

INTRODUCTION

The The foundation of the Nigerian economy is agriculture. With modest holdings ranging from 0.5 to 3.0 hectares per household, it involves small-scale farmers dispersed throughout a large land region. These farmers are known for their poor capitalization, crude agricultural methods, and low crop yields per hectare (Kolawole & Ojo, 2007). According to Babatunde et al. (2007), it is the main source of employment for Nigerians and contributes over one-third of the country's GDP and labor force.

According to estimates, one in three people worldwide suffers from severe malnutrition (FAO, 2014; WFP, 2015), and 795 million people lack access to food that is both adequate in quality and quantity (Elver, 2015; WFP, 2015). According to Ashagidigbi et al. (2012), more than 40% of Nigeria's estimated population suffers from undernutrition. Most households' productivity is lowered and their capacity to make the best use of food is hindered due to various types of deprivation of basic necessities. Three main variables influence the demand for food: population expansion, which increases the number of people, urbanization, which advances infrastructure, and, of course, changes in consumption patterns brought about by changes in lifestyle (Pieters et al., 2013). Given supply-side considerations, Nigeria is now one of the world's top producers of these staples, accounting for a larger portion of the country's output of different grain legumes (Kormawa et al., 2002). There is a dearth of information on the factors influencing demand for these essentials, despite the fact that they are important for food production and policy planning.

Consumer demand, which is crucial to this subject, is addressed by the conventional theory of demand. The supply and demand for food staples, which are perhaps the most fundamental of all human needs, have remained unstable in Nigeria. The demand for staple foods has been the subject of several research, mostly at the national, regional, or zonal levels (Tsegai & Kormawa, 2002; Okoruwa & Adebayo, 2006; Ashagidigbi et al., 2010). However, there is a lack of food demand analysis in Nigeria at the household and state levels. As a result, this study took advantage of the gap in the literature. The study, which looked

at the urban household demand analysis for cowpea, yam, and rice in Minna, Niger State, is quite significant. It determined the elements that account for the variation in demand for the various food types. The results could be used as a guide for policy, increase demand for regional staples, boost national consumption, and identify strategies to enhance the welfare of both producers and consumers.

MATERIALS AND METHODS

Study area

The Latitudes 80020' to 11030' N and longitudes 03030' to 07040' E are the coordinates of Niger State, Nigeria. Zamfara State to the north, Kebbi State to the west, Kogi State to the south, Kwara State to the southwest, and Kaduna State and the Federal capital territory to the northeast and southeast, respectively, are her neighbors (Niger State Ministry of Information, 2005).There were 3,950,249 people living in the state as of the 2006 census, and that number is expected to rise at a pace of 2.38% per year. The state's estimated population as of 2012 is 4,514,344 due to the rate of population increase (NPC, 2006).

Sampling design

The respondents were chosen using a three-stage random sampling technique. Because of the state capital's increasing population in comparison to other regions of the state, Minna was purposefully chosen for the first stage. Five (5) wards from the city—Bosso low cost, Maikunkele, Saukakahuta, Tunga low cost, and Chanchaga—were chosen at random for the second stage. Twenty-two (22) households were randomly picked from each ward, taking into consideration the survey frame from each chosen ward. This resulted in a total of 110 households for the study. A systematic questionnaire and a schedule for in-person interviews were used to gather data.

Analytical methods

Multiple regression technique was used to analyze the data of the study. Some of the collected data were used to calculate the average weight of the commodities as well as derive the prices per kilogram of these staple foods as:

Specification of the model

To estimate household demand elasticity of the three food products, a demand function was fitted for the data following the work of Kassali *et al.* (2010). The implicit form of the demand model is specified as;

The lead equation was selected after the data was fitted to various functional forms using standard economic, econometric, and statistical criteria, including the relative magnitude of the coefficient of multiple determinations (R2 value); adherence to a previous expectation in the signs of the predicted regression coefficients; calculated regression coefficient magnitudes; Both the F-ratio and the computed regression coefficients have statistical significance.

RESULTS AND DISCUSSION

Estimation of the demand functions for the food Items

For the food items that the respondents consumed, demand functions were approximated. Four distinct functional forms were fitted to the data in each instance, and the lead equation was selected using standard statistical, econometric, and economic standards. The exponential functional form was the "lead equation" (equation of best fit), according to the results in Table 2. Only three of the eight variables (X1–X8) in this model—price of substitute, income, and household size—were found to have a significant impact on the quantity of rice demanded at the 5% and 1% levels, respectively, with estimated regression coefficients of -0.265, 0.595, and 0.313. The coefficient for the substitute's price was negative. This suggests that the demand for rice rises as the cost of alternatives falls. It was discovered that the coefficient was positive in relation to the consumer's income. It is implied that the demand for rice rises in tandem with consumer income, indicating that rice is a typical good.

This outcome meets expectations and is instructive (Omonon et al. 2009: Kassali et al., 2010). The demand for rice was positively correlated with the household size coefficient, suggesting that the demand for rice rises with household size. This aligns with theoretical foundations as well, as demonstrated by Reardon & Escoba, 2001; Omonona et al., 2009; Abdullahi et al., 2011; Musa et al., 2011; Sampson, 2013; Danquah & Egyir, 2014; Danso et al., 2014; however, it contradicts Almas et al.'s (2019) findings that household size has a negative relationship with demand based on household consumption expenditure.

The exponential form's R2 was 0.713, indicating that the independent variables in the exponential regression model accounted for 71.3% of the variation in the demand for rice consumption. At least one of the explanatory variables' coefficients is substantially different from zero, indicating a strong fit, according to the fitted model's significance (F=28.819), which was judged to be significant at 1%.

The lead equation was the Cobb-Douglas form, according to the results in Table 3. Just two of the eight variables that were modeled were determined to be significant; at the 1% significant level, the price of yam and income were shown to have a significant impact on the quantity requested of yam, with estimated regression coefficients of -1.262 and 0.289, respectively. The yam's price was in line with the priori expectation because its coefficient was negative. The work of Kassali et al. (2010) is supported by the inference that when yam prices rise, yam demand falls. The coefficient pertaining to respondents' income was found to be positive, suggesting that yam is a typical good because consumer demand for it increased as income rose. The chosen factors accounted for around 75% of the variation in household demand for yams, according to the coefficient of multiple determination (R2=0.751). At least one of the explanatory variable coefficients is substantially different from zero, according to the regression equation's overall significance (F=24.153), which was determined to be significant at 1 percent.

Table 4 demonstrated that the lead equation (equation of best fit) was the linear functional form. Two factors in this model—income and substitute price—were found to have a substantial impact on the quantity of cowpeas demanded at the 5% and 1% levels, respectively, with estimate regression coefficients of 0.004 and 1.799E-5. The demand for cowpeas was positively correlated with the substitute's price coefficient. Therefore, it was anticipated that a 0.4% drop in the quantity requested of cowpeas would result from a percentage increase in their price. The consumer's income was shown to have a positive coefficient, indicating that cowpeas are a typical good. This supports the findings of Diako et al. (2010) and Kassali et al. (2010), which show that income was a significant predictor. The linear regression model's independent variables accounted for 89.9% of the variation in demand for cowpea consumption, according to the linear functional form's R2 of 0.899. At the 1% level, the F-ratio of 5.924 is statistically significant. This suggests that the dependent variable was sufficiently explained by

the explanatory variables.

Estimated Demand Elasticity by Own Price, Cross Price, and Income

The own price, cross price and income elasticity with respect to the commodities (Rice, yam and cowpea) were computed and the results are presented below.

The calculated own price, cross price, and income elasticity of demand for rice are -0.308, -0.132, and 0.018, respectively, according to the results in Table 5. The calculated values for yam are -1.262, 0.028, and 0.289, in that order. Conversely, the values for cowpea are -0.530, 0.005, and 0.002, in that order. These numbers were calculated using the proper formulas. Since the concavity constraint from utility theory stipulates that own-price Hicksian or Marshallian demand elasticities must be negative, the own price elasticity for every food under consideration is negative and, therefore, consistent with demand theory (Omonon et al., 2009; Addo, 2016). This suggests that the demand for cowpea and rice (-0.530) and -0.308, respectively, are inelastic, indicating that a change in price will result in a change in quantity sought for the goods that is less than proportional. This is consistent with Korir et al. (2018)'s findings but contradicts those of Kassali et al. (2010). Nonetheless, the demand for yam (-1.262) is demand elastic, which means that a small price increase would result in a larger decline in demand, but a small price drop would result in a more than proportionate rise in yam demand, which would improve industry profits. This supports the Kassali et al. (2010) findings.

Cowpea, yam, and rice have cross price elasticities of 0.005, 0.028, and -0.132, respectively. Since they represent a measure of substitution effects net of income, this provides a more lucid picture of cross-price substitution between goods. As might be predicted, yam and cowpea have positive cross-price elasticities, indicating that they are substitutes. This aligns with Korir et al. (2018)'s research.

Table 5's results also showed that the demand for rice has a positive income elasticity (0.018), which is less than 1 but larger than 0. Accordingly, a percentage change in income will result in a less than proportionate change in the quantity demanded, indicating that rice is income inelastic. A negative price elasticity confirmed that rice is a normal good in the research area and can also be a requirement because of the positive income-demand relationship. This supports the findings of Addo (2016) and Kassali et al. (2010). The yam's demand has a 0.289 positive income elasticity. In the research area, yam is therefore considered a luxury meal. Inadequate storage facilities and the seasonality of its production—yams were not produced—allow it to be available at lower prices during off-season. Cowpea demand has a positive income elasticity that is greater than zero (0) but less than one (0.002). Cowpeas are hence income inelastic. This suggests that a price change will cause the quantity demanded to fluctuate less proportionately. According to the aforementioned, cowpeas are a common good and essential in the research domain.

CONCLUSION

The study looked at the demand for particular foods in urban households in Minna Metropolis. Rice, yam, and cowpeas are price inelastic, according to the study. Yam was found to be a luxury in terms of income elasticity, while rice and cowpea were shown to be typical products. The pattern of food consumption is more closely related to socioeconomic traits of family heads, convenience of preparation, and urban lifestyles than it is to price. The government should provide a suitable policy framework that would safeguard consumers in order to increase the demand for food in urban households. This can be accomplished by offering silos, purchasing the goods when the market is oversupplied, and reselling them to customers at a discount during the off-peak times of the year.

ACKNOWLEDGEMENT

The authors would like to thank the study area respondents for supplying them with accurate and useful information, as well as their field enumerators who helped with the survey.

Authors' contributions

The research strategy was created by Tanko, L. and Obalola, O.T. Kobe, H.I., Aboaba, K.O., and Agboola, B.O. created the survey and oversaw the data gathering procedure. Bello, B.A. examined the information. The original draft was written by Odum, E.B.E., and the final version was completed with input and comments from Audu, R.O., and Danilola, S.T. All authors authorized the paper in its final version.

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this manuscript.

REFERENCES

Abdullahi, F.A., Zainalabidin, M., & Ismail, A.L. (2011). The influence of socio- demographic factors and product attributes on attitudes toward purchasing special rice among Malaysian consumers. *International Food Research Journal, 18*(3), 1135- 1142.

Addo, A.R. (2016). Analysis of the demand for locally produced rice in Kumasi, Ghana. (MSc. Thesis, Department of Economics, Kwame Nkrumah University).

Almas H., Esfandiar, M., & Guanghua, W. (2019). An Analysis of the Determinants of Household Consumption Expenditure and Poverty in India. *Economies, 7*(96), 1-27. DOI: https://doi.org/10.3390/economies7040096.

Ashagidigbi, W.M., Yusuf, S.A., & Okoruwa, V.O. (2012). Determinants of Households' Food Demand in Nigeria. *World Rural Observation, 4*(4), 17-28.

Babatunde, R.O., Omotesho, O.A., & Sholotan, O.S. (2007). Socioeconomics characteristics and Food Security Status of Farming Households in Kwara State, North-Central Nigeria. *Pakistan Journal of Nutrition, 6*(1), 49-58. DOI: https://doi.org/10.3923/pjn.2007.49.58

Danquah, I.B., & Egyir, I.S. (2014). Factors that influence household demand for locally produced brown rice in Ghana. *Journal of Economics and Sustainable Development*, *5*(7), 14-24.

Danso, A.G., Armed, M., & Baidoo, F. (2014). Determinants of consumer preference for local rice in Tamale Metropolis, Ghana. *International Journal of Education and Social Science, 1*(2), 114-122.

Diako, C., Sakyi-Dawson, E., Bediako-Amoa, B., Saalia, F. K., & Manful, J. T. (2010).Consumer perceptions, knowledge and preferences for aromatic rice types in Ghana. *Nature and Science, 8*(12), 12 – 19.

Elver, H. (2015).Why are there still so many hungry people in the World, London, UK: The guardian?

Food and Agriculture Organization of the United Nations (2014).The State of Food Insecurity in the World: Strengthening the enabling environment for food security and nutrition, Rome:

FAO.
Kassali, R., Kareem, R.O., Oluwasola, O., & Ohaegbulam, O.M. (2010). Analysis of Demand for Rice in Ile Ife of Osun State. *Journal of Sustainable Development in Africa, 12* (2), 40-79.
Korir, L., Rizov, M., & Ruto, E. (2018). Analysis of household food demand and its implications on food security in Kenya: an application of QUAIDS model. Agricultural Economics Society-AES, 92nd Annual Conference, April 16-18, 2019, Warwick University, Coventry, UK. DOI: https://doi.org/10.22004/ag.econ.273474.
Kormawa, P.M., Chianu, J.N., & Manyong, V.M. (2002).Cowpea demand and supply patterns in West Africa: the case of Nigeria, 376-386.
Musa, M., Othman, N., & Abdul-Fatah, F. (2011). Determinants of consumers purchasing behavior for rice in Malaysia. *American Journal of Contemporary Research, 1*(3), 159 – 167.
National Population Commission (NPC) (2006). Nigeria's National Census NPC, Abuja.
Niger State Ministry of Information. (2005). Background information on Niger state, the history and location.
Okoruwa, V.O., & Adebayo, E.A. (2006). Household Food Demand Analysis in Adamawa State, Nigeria. *Global Journal of Agricultural Sciences, 5*(2), 109-115.
Omonona, B.T., Nkang, N.M., & Ajao, F.A. (2009). Household food demand analysis: a survey of semi urban and rural households in south-west Nigeria. *Global Journal of Pure and Applied Sciences, 15*(3&4), 315-324. DOI: https://doi.org/10.4314/gjpas.v15i3-4.48545
Pieters, H., Guariso, A., & Vandeplas, A. (2013). Conceptual framework for the analysis of the determinants of food and nutrition security. Food secure, Working papers 13, pp. 1-51. Retrieved from *http://www3.lei.wur.nl/FoodSecurePublications/13_P...ceptualFramework.pdf*
Reardon, T., Berdegue, J., & Escobar, G. (2001). Rural Nonfarm Employment and Incomes in Latin America: Overview and Policy Implications. *World Development*. *29*(3), 395-409. http://www.sciencedirect.com/science/article/pii/S0305-750X(00)00112-1. DOI: https://doi.org/10.1016/S0305-750X(00)00112-1
Sampson, K. (2013).Consumer preferences and willingness to pay for locally produced rice in Kumasi Metropolis of Ghana (Doctoral Dissertation, Kwame Nkrumah University of Science and Technology).
Tsegai, D. & Kormawa, P. (2002). Determinants of urban households' demand for cassava products in Kaduna, Northern Nigeria: The application of AIDS model. Paper presented at conference of International Agricultural Research for Development Witzenhausen, 9-11 October 2002.
United Nations System in Nigeria .(2001). Nigeria Common Country Assessment, March 2001. UNDP, Lagos pp.48
United Nations Organization (UNO). (1991). The causes of Africa's food crisis. *African Development Journal*, *2*, 1631-1645.
World Food Programme. (2015). Food Security Analysis (VAM). Rome, Italy: United Nations World Food Programme.

Table 1: variables and their respective *a priori* signs

Variables	*A priori*	Remark
Price of the commodity	Negative	As price increases, the quantity demanded decreases
Price of substitute	Positive	as price(s) of substitute good(s) increases, the quantity demanded for the other commodity increases
Income	Positive	As income increases, the quantity demanded of the commodity should increase. Normal goods
	Negative	As income increases, the quantity demanded of the commodity decreases. Inferior goods
Household size	Positive	As household size increases, the demand for the commodity should increase
Level of education	Positive	Satisfactory educational level tends to influence quantity demanded positively
Gender	Positive/negative	This tends to flow with the preference as it can either influence quantity demanded positively or negatively
Age	Negative	As the age increases, the quantity of the commodity purchased tends to decrease as older people are likely to resort to traditional staple foods as substitute.
Frequency of purchase	Positive	The frequency of purchase is expected to influence demand positively

Source: Author's design

Table 2: Factors affecting the demand for rice in the study area

Variables	Linear	Semi-log	Exponential	Cobb- Douglas
Constant	1.657 (1.764)	-14.731* (-2.384)	-3.514* (-2.416)	0.629* (2.473)
Price of rice	-0.001 (-0.471)	0.187 (-0.154)	0.22 (0.075)	0.000 (0.340)
Price of substitute	-0.002 (-1.502)	-1.397** (-2.812)	-0.265* (-2.262)	0.000 (-1.303)
Income	5.713E-5**(9.633)	2.423** (7.450)	0.595** (7.771)	1.477E-5** (9.207)
Household size	0.123 ** (2.660)	1.443 ** (2.807)	0.313 ** (2.588)	0.014 (1.149)
Level of education	-0.108 (-1.629)	-0.223 (-0.585)	-0.091 (-1.017)	-0.045* (-2.517)
Gender	-0.195 (-0.857)	0.145 (0.637)	-0.789 (-0.112)	0.006 (0.093)
Age	-0.005 (-0.349)	-0.943 (-1.034)	-0.215 (-1.001)	0.003 (0.682)
Freq. of consumption	0.179 (1.706)	0.194 (0.609)	0.040 (0.529)	0.043 (1.497)
R^2	0.661	0.709	0.713	0.641
R^2 adjusted	0.634	0.671	0.675	0.613
F-ratio	24.635**	18.444**	28.819**	22.548**

Source: Field Survey, 2018.
*Note: * and** implies statistically significant at 5%, and 1% level respectively. Figures in the parentheses are the respective t- ratios.*