



Food Affordability Among Households in Akure South Local Government Area, Ondo State, Nigeria: Any Rural-Urban Divide?

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ABSTRACT

Affordability remains a crucial barrier to accessing nutritious foods that constitute healthy diets especially in Africa. The aim of the research is to analyze rural-urban divide in food affordability. Primary data were collected for the purpose of this research with the aid of structured questionnaire using a two-stage sampling procedure. The survey covered 125 households from rural and urban areas. The data collected were analysed using descriptive and inferential statistics. The Cost of Recommended Diets (CoRD) was calculated using 2023 prices of commonly available, least-cost foods within each food group identified in the food based dietary guidelines. The estimated CoRD per day was ₦3466.98 and ₦2730.87 for urban and rural households respectively. In the same vein, the per capita cost of urban households was ₦199.40 higher than the rural households. However, when compared with the food expenditure, unaffordability of food was higher in the rural areas. The results revealed that only 13.3% of households in the rural areas can afford the daily cost of recommended diets compared with 33.3% in the urban areas. The logit regression results revealed that household size, households' health expenditure and expenditure on cooking fuels were significant factors affecting households' food affordability. The study concludes that food affordability is generally low among Nigerian households. However, rural households had a lower food affordability rate than the urban households. Social protection programmes that could help households cope with high prices is recommended. More attention should be focused on resilience building among households, particularly in the rural areas.

Keywords: Affordability, Food prices, Healthy diet, Nigeria, Rural Urban.

INTRODUCTION

Food has a vital role in a person's growth and development. According to Ahmed *et al.* (2015), the Universal Declaration of Human Rights recognizes the right to a standard quality of living, which includes food security. As a vital component of food security, food affordability is a major challenge for any country. Food affordability influences dietary habits, nutritional status, general health and

environmental impacts, making it a significant factor of food choice and access. Among the world's poorest populations, affordability continues to be a major obstacle to obtaining wholesome foods that comprise balanced diets, especially in low-income nations in South Eastern Asia and sub-Saharan Africa (World Business Council for Sustainable Development, 2022). Over 3.1 billion people

could not afford healthy diets (Food and Agriculture Organization (FAO), 2021) and malnutrition continues to be a major burden to the international community (World Health Organization (WHO), 2020). Furthermore, it has been projected that 600 million people will be chronically undernourished in 2030 (FAO *et al.*, 2023). On the average, 783 million people in the world are affected by hunger with majority living in Africa (FAO *et al.*, 2023a). According to World Food Programme (WFP) (2023), the present hunger levels are higher than the previous years. Hence, there is a great challenge of attaining the Sustainable Development Goal (SDG) target of eradicating hunger.

In Africa, meeting the Melabo targets of eradicating hunger and malnutrition in all its forms by 2025 and the SDGs of food and nutrition security by 2030 remains infeasible (United Nations Economic Commission for Africa, 2022). It is worrisome that no improvement has been observed in the nutrition of citizens in many African nations with 19.7% of the population being undernourished (WFP, 2023). Larger proportions of the population in Africa are affected by hunger compared to other regions and there is a forecast of significant increase in African hunger levels (FAO *et al.*, 2023b). According to World Bank report, one out of five African goes to bed hungry while 140 million Africans experienced acute food insecurity (World Bank, 2022). The sub-Saharan has the highest prevalence of undernourishment in the world at 22.5% with West Africa recording 14.6%. In the region, severe food insecurity is more prevalent in the rural areas. From estimates, 33.3% of adults in rural areas were affected by severe food insecurity compared to 26.0 % in the urban areas (FAO *et al.*, 2023).

Food and nutrition security is threatened by a number of factors, including the rising cost of nutritious food and widening inequality. The estimates of the cost and affordability of a healthy diet are useful indicators of people's economic access to nutritious foods and healthy diets. Despite the Gross Domestic Product (GDP) of the United States of America (USA) is over 35 times higher than

Africa's; the cost of healthy diet in the continent is as high as that of USA (UNICEF, 2023). Roughly 78% of Africans were unable to afford healthy diets compared with 42% globally. The average cost of healthy diets has been on the increase overtime. In Africa, it stood at 3.57 Purchasing Power Parity (PPP) dollars per person per day in 2021. This value is higher than the extreme poverty threshold of USD 2.15 per person per day. This indicates that both the poor and large proportion of the non-poor cannot afford a healthy diet in the region (Reliefweb, 2023). Furthermore, the prices of staple food in SSA have increased by an average of 23.9% between 2020 and 2022 (Okou *et al.*, 2022). In the same vein, West Africa recorded the largest cumulative increases in the cost of healthy diets between 2019 and 2021.

In Nigeria, the food insecurity situation has been alarming with 18.6 million people being food insecure in 2023. Rising inflation, climate crisis, conflict and insecurity among other factors are responsible for hunger in the country (International Monetary Fund, 2023). The food inflation rate in the country has been on the increase, the rate stood at 23% in 2023. Furthermore, the country ranked 109th out of 125 countries with global hunger index score of 28.3, revealing a serious hunger situation (Global Hunger Index (GHI), 2023). In the global food security index considering core issues of affordability, availability, quality and safety, sustainability and adaptation, Nigeria ranked 107th out of 113 countries with overall score of 42.0. The nation had the lowest affordability score of 25.0 which is an indication that food insecurity and malnutrition in the nation is linked to poverty (Economist Impact, 2022). Though staples make up nearly two-thirds of the daily diets of the poor households, unfortunately, they lack wide range of substitutes for staples unlike the better-off households (Mekonnen *et al.*, 2021). The impact of global prices on rural food inflation has been more launce. Rural households face a high level of income variability as a result of factors beyond their control (Etea *et al.*, 2019). Therefore, this study examined rural-urban divide in food affordability among Nigerian households.

Specifically, the study analyzed and compared the food affordability of rural and urban households; and determined the factors influencing food affordability. The study contributes to the few existing literature on food affordability in Nigeria, namely Mekonnen *et al.* (2021) and Mekonnen *et al.* (2023). These studies utilized national data obtained in 2015/16 and 2018/19 respectively, which are collected over 5 years ago. Considering the rise in the country's inflation rate, it is imperative to have an update of food affordability especially at the community level. Furthermore, the study employed Cost of Recommended Diets (CoRD) which places more emphasis on cheaper food items. It also examined rural-urban divide in food affordability, thereby revealing the locality where resilience building for improved food system should be intensified.

MATERIALS AND METHODS

The Study Area

The study was conducted in Akure South Local Government Area of Ondo State, Nigeria. With its headquarters located in Akure, which also serves as the state capital.

Akure South Local Government Area (LGA), is one of the eighteen LGAs in Ondo State and one of the six (6) LGAs designated as the Ondo central senatorial district. It lies between longitudes $5^{\circ} 50' \text{ E}$ and $7^{\circ} 25' \text{ E}$ and latitudes $7^{\circ} 21' \text{ N}$ and $7^{\circ} 50' \text{ N}$. Its landmass is 331 square kilometers in size, and it is situated at 250 meters above sea level (Ajala and Adegboyega, 2024). Akure North Local Government Area borders it on the northeast, while Ifedore Local Government Area borders it on the northwest and Idanre Local Government Area borders it on the southern part (Figure 1). The area plays host to the Federal University of Technology and as such is a community with multi-ethnic representation of Nigeria because of the influx of students, workers, traders etc. into the area. The major occupation of the people in the rural area is farming of arable crops like maize, yam, cassava, vegetables etc.; permanent crops like cocoa, kolanut etc. and also livestock farming. People in the urban areas engage in secular jobs such as civil service, trading and artisans (Folayan, 2013; Oseni, 2015; Ogunyinka *et al.* 2024).

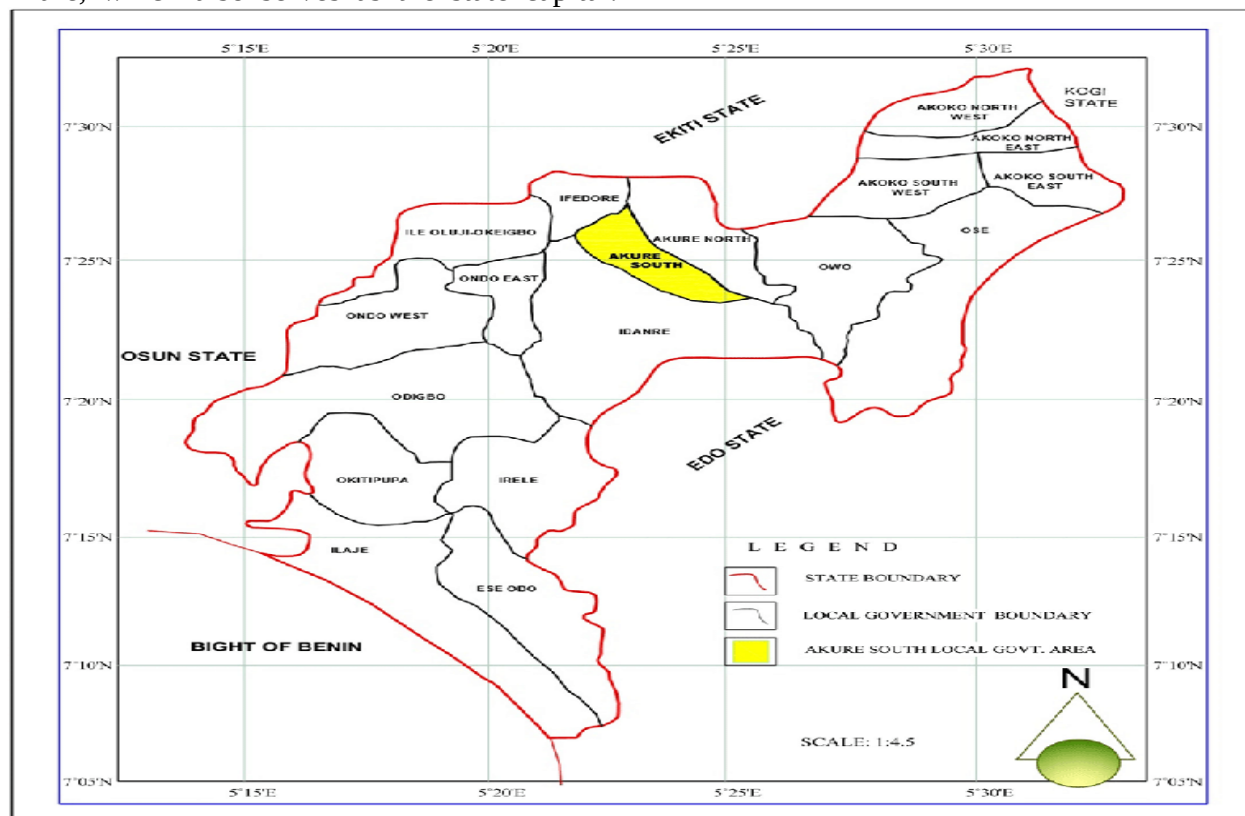


Figure 1: Map of Ondo State showing the Study Area

Source: Ondo State Ministry of Housing and Urban Development, Akure, Ondo State

Sampling Procedure

A two-stage sampling procedure was used in the selection of the respondents. The first stage involved the purposive selection of two (2) communities each from urban and rural areas in the Local Government Area, namely Alagbaka and Ijapo from the urban area and Ipinsa and Awule in the rural area. In the second stage, there was random selection of households from the selected communities proportionate to size; 40 households were selected from each urban community while 22 households were selected from each rural community. This gave a total of 124 respondents. However, due to incompleteness of few copies of the questionnaire, only 120 copies were used in the analysis.

Data Collection

Primary data were collected for this study using a structured questionnaire. The data collected include socio-economic characteristics of the respondents such as: age, gender, educational level, marital status and household size, etc.; food consumption and food expenditures.

Data Analysis

Data were analyzed using descriptive statistics, Z-test, price-based index and logit regression analysis. Descriptive statistics such as frequency, percentage, mean, and tables were used to describe the selected socio-economic characteristics. Z-test was used to examine the significant differences between the food affordability index of rural and urban households.

Price-based index

The study used a price-based index to measure the Cost of Recommended Diet (CoRD) (Dizon *et al.*, 2019). The index is a measure of the minimum amount it would cost to meet national Food Based Dietary Guideline (FBDG) (Herforth *et al.*, 2020). Calculation of the CoRD uses prices of commonly available, least-cost foods within each food group identified in FBDG. The calculation of CoRD is a straight forward arithmetic, it was calculated in the steps summarized below, following Dizon *et al.* (2019), Raghunathan *et al.* (2020), and Herforth *et al.* (2020):

1. Categorize each food in food price list according to the food groups in the dietary guidelines identified in the FBDG.
2. Remove items not required for a healthy diet (e.g., sweets) and duplicate items (e.g., multiple varieties of rice).
3. Calculate price per day for each item, using the price per kilogram or other standard unit multiplied by the recommended quantity per day, accounting for edible portion. For the above and related reasons, the 2001 Nigeria dietary guideline favours the food-based approach to “quantitative goals and recommendations for nutrient intakes” (Federal Ministry of Health, 2006)
4. Take the average of the 1-3 lowest cost items (price/day) in each food group.
5. Sum the cost for all food groups.

Clearly, the cost of healthy diet calculations described above requires quantified dietary references. The Nigerian FBGD published in 2001 identified five food groups to healthy eating. However, the Nigerian food guide does not specify reference quantities. Hence, following Herforth *et al.* (2020), a quantified FBDG from Benin, a neighbouring country was used for the calculation of the CoRD. The Benin’s FBDG was chosen because it is the most recent and only quantitative choice available in SSA (Herforth *et al.*, 2020). Moreso, since Nigeria and Benin are in West Africa region and share borders, they are likely to have similar foods and food systems compared to other regions of the world. Hence, Benin’s FBDG could be a better proxy for Nigeria than FBDGs from other parts of the world.

Logit regression model specification

The Logit regression model was used to determine the factors influencing food affordability status of the households. The specification of the Logit model is as follows (Leeper, 2017):

$$P_i = E(Y = 1/X_i) = 1 / (1 + e^{-z}) \quad 1$$

Where: Y is dependent variable which is a dichotomous response variable (1= if household can afford food; 0=otherwise)

P_i is a probability that $Y_i = 1$, its values range from 0 to 1, and it is assumed to be non-linearly related to Z.

$$Z = \beta_0 + \beta_i X_i \quad 2$$

Where:

X_i = a set of independent variables

β_0 = the intercept which is a constant

β_i = the coefficient of the identified variables influencing

Where: Y= food affordability status (Yes=1, No=0)

X_1 = Sex of household head (female=0, male=1)

X_2 = Household's head age (years)

X_3 = Household size (number)

X_4 = Locality (urban=1, rural=0)

X_5 = Household income (Naira)

X_6 = Cooperative society (yes=1, 0 otherwise)

X_7 = Transportation expenditure (Naira)

X_8 = Cooking fuel expenditure (Naira)

X_9 = Health care expenditure (Naira)

ε = error term

$\beta_0, \beta_1 - \beta_9$ = vectors of food index parameters to be estimated (Regression coefficients).

RESULTS AND DISCUSSION

Descriptive Analysis of the Socio-Economic Characteristics of the Respondents

The descriptive statistics of the socio-economic characteristics of the respondents is presented in Table 1. The results revealed that majority (95.8%) of the household heads were males with a mean age of 44 years. This indicates they are in their economically active age. This is consistent with Adepoju *et al.* (2016). Majority of the respondents were married while the mean household size was 5 persons. This show that they don't have a large household size. This aligns with the findings of Adepoju *et al.* (2016) in Akure Metropolis of Ondo State. Most of the household heads were educated with 55% having tertiary education. This is in line with Ogungbade *et al.* (2020) which claimed that majority of respondents in Akure metropolis were educated. The mean monthly household income was ₦171,417. Most of the respondents were salary earners; however, many of them diversified their income.

Food Affordability Status of Households

Based on the Cost of Recommended Diets (CORD), the household's least-cost healthy diet cost was ₦3098.00 per day while the per

capita cost was ₦609.67 per person per day (Table 2). This value is significantly higher when compared with ₦235 per person per day obtained from 2018/19 dataset by Mekonnen *et al.*, (2023). This pictured high inflation rate in the country which has pushed many into poverty. Estimating affordability of diets with respect to the household's daily food expenditure, it was observed that 76.7% of the households cannot afford food. This depicts high rate of unaffordability of healthy diets among households. Furthermore, this suggested high rate of depreciation in the disposable income of many Nigerians and confirms previous findings that cost of healthier foods and nutrient adequacy is unaffordable by the poor (Bai *et al.*, 2020; Herforth *et al.*, 2020; Raghunathan *et al.*, 2020). This is also worrisome when compared with Mekonnen *et al.* (2023), which was estimated from the 2018/2019 national dataset. that 65% of Nigerian households could afford healthy diets.

Furthermore, the study examined the rural-urban divide in food affordability (Table 2). The household's least-cost healthy diet cost was higher in the urban households compared to rural households. From the study, the estimated CORD per day was ₦3466.98 and ₦2730.87 for urban and rural households respectively. In the same vein, the per capita cost of urban households was ₦199.40 higher than the rural households. However, when compared with the food expenditure, unaffordability of food was higher in the rural areas. The results revealed that only 13.3% of households in the rural areas can afford the daily cost of recommended diets compared with 33.3% in the urban areas. This is in line with Mekonnen *et al.* (2021) which concluded that affordability of healthy diets was higher in urban region of the country than the rural areas. According to the study, this might be adduced to the high prevalence of poverty in the rural areas and the complexities that exists in rural-urban food price patterns (National Bureau of Statistics (NBS), 2020; Nakamura *et al.*, 2016).

Table 1: Descriptive Statistics of the Respondents' Socio-Economic Characteristics

Variables	Frequency	Percentage (%)
Sex		
Male	115	95.8
Female	5	4.2
Age >35	6	5.0
35-44	33	27.5
45-54	41	34.2
55-64	26	21.7
<65	14	11.7
Mean 44 years		
Marital status		
Single	6	5.0
Married	109	90.8
Widowed/separated	5	4.2
Family type		
Monogamous	109	90.8
Polygamous	11	9.2
Household size	68	
1-5	52	56.7
6 -10		43.3
Mean 5 persons		
Educational qualification		
Primary Education	3	2.5
Secondary Education	50	41.7
Tertiary Education	66	55.0
No formal education	1	0.8
Primary occupation		
Farming	29	24.2
Trading	30	25.0
Artisan	14	11.7
Processor	1	0.8
Salary job	46	38.3
Income diversification	83	0.69
Yes	37	0.31
No		
Cooperative membership	106	88.33
Yes	14	11.67
No		
Cooking fuel expenditure		29.17
1000 – 5000	35	48.33
5001 – 10000	58	22.50
>10000	27	
Mean = 6391.66		
Transportation	12	10.0
1000 – 5000	10	8.33
5001 – 10000	23	19.17
10001 – 15000	42	35.0
15001 – 20000	30	25.0
20001 - 25000	3	2.50
>25000		
Mean = 20991.67		
Healthcare	30	0.25
1000 – 5000	56	46.67
5001 – 10000	34	28.33
>10000		
Mean= 7479.73		
Monthly income		
<100,000	44	36.7
100,001-200,000	52	43.3
200,001-300,000	10	8.3
300,001-400,000	8	6.7
400,001-500,000	4	3.3
>500,000	2	1.7
Mean= 171416.7		

Source: Authors' Estimation (2023)

Though, it is expected that rural areas should have higher level of affordability of diets than urban since food production is concentrated in the rural areas and households consume food

from self-production. The finding is contrary to expectation. The challenges of post-harvest losses, inadequate storage and processing facilities may be responsible for the higher

level of unaffordability in the rural areas. Most agricultural produce are highly perishable, as a result, farming households are forced to sell their produce at cheaper prices during the peak season while they result to purchasing at the

lean periods. This necessitates the need to proffer solutions to the post-harvest bottlenecks encountered by rural farming households in Nigeria.

Table 2: Cost of Diets and Households' Food Affordability Status

Variables	All	Rural	Urban	Difference
Household's CORD/day	3098	2730.87	3466.98	736.11**
CORDper capita/day	609.67	509.97	709.37	199.40***
Food affordability	23.3	13.3	33.3	20.00**

Source: Authors' Estimation (2023)

Key: ** = 5% and *** = 1% significance levels.

Determinants of Food Affordability

The results of the Logit regression model on the factors influencing the household's food affordability are shown on Table 3. The Prob > chi2 is 0.0001, indicates that the overall model is statistically significant at a 1% level. The Pseudo R2 value of 0.5526 indicates that the model explains 55.26% of the variation in the dependent variable. From the results, household size, cost of cooking fuel and healthcare expenditure significantly influenced food affordability.

From the results of the study, the household size reduces the odd of food affordability. The larger the household size, the lower the odd of food affordability among households. This is consistent with Amao et al. (2023) that large household size reduces food security status of households in Nigeria. Similarly, Zhang et al. (2021) opined that household size had a negative effect on household food security in Wuhan, China. In the same vein, cost of cooking fuel reduced the odd of food affordability. In Nigeria, the price of clean

cooking fuel especially the Liquefied Petroleum Gas (LPG) has increased sharply in recent years. According to Perros & Shupler (2022), the high cost of clean fuel forces households to shift to dirtier alternatives. The study reported that a combination of rising gas and food prices forced families to eat fewer and low-quality meals in Sri Lanka and Vietnam. High cooking fuel prices can cause households to reduce intake of protein because more energy is required for the cooking. Furthermore, Fadly et al. (2023) found that dirty fuels which are cheaper reduced the number of meals per day by 1.5% in India. Akano et al. (2023) posited that affordable clean fuels significantly improve national food security outlook in Nigeria.

Moreover, from the results of the study, health care expenditure significantly ($P < 0.05$) reduced the odd of food affordability of households. According to Dean et al. (2020), less food secure households are more likely to have higher health care expenditure.

Table 3: Factors Affecting Food Affordability

Variable	Coefficients	Standard error	p/z/	dy/dx
Locality	-.3185761	1.261916	0.801	-.0575014
Sex	-2.229152	2.630576	0.397	-.499955
Age	.0284397	.0778103	0.715	.0048347
Household size	-1.939208**	.9357156	0.038	-.3296614
Income	1.30e-08	6.11e-06	0.998	2.21e-09
Cooperative membership	10.2722	2005.975	0.996	.4757183
Transportation expenditure	-0.0000192	.0000328	0.559	3.26e-06
Cooking fuel expenditure	-0.000418*	.0002409	0.083	.0000711
Health care expenditure	-0.0002284 **	.000099	0.021	.0000388
Constant				
Prob > chi ²	0.0001			
Pseudo R ²	0.5526			

Source: Authors' Estimation (2023)

CONCLUSION

The study examined food affordability among households at the community level using the Cost of Recommended Diets (CoRD). The household's least-cost healthy diet cost was higher in the urban areas compared to rural areas. Food affordability is low among all households. However, urban households had a higher food affordability rate than the rural households. Health care expenditure, household size and cooking fuel expenditure significantly reduced food affordability. The study recommends that resilience building for improved food system should be intensified in the rural areas. Family planning should be encouraged among households and the price of clean fuel should be made affordable for Nigerian citizens. The health care system should be improved to reduce out-of-pocket health expenditure among households at community levels and social protection programmes that could help households cope with high food prices should be introduced.

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