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Food Insecurity among Urban Households in Nigeria: Recent Evidence from Jos Metropolis, Plateau State

R.O Babatunde.¹, A.O Adejobi,² S.B. Fakayode,¹ and E.K Ndulue³

¹Department of Agricultural Economics and Farm Management, University of Ilorin, PMB 1515 Ilorin, Kwara State, Nigeria

²Nigeria. Department of Agricultural Economics, Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria.

³Department of Agricultural Economics and Social Sciences, University of Hohenheim, D-70593 Stuttgart, Germany.

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ABSTRACT: For the fact that food insecurity had been considered a rural problem, most empirical studies on food insecurity as well as food security strategies in developing countries have concentrated more on the rural areas as against urban areas. Recently however, increased urbanization in developing countries brings about great challenges for assuring urban household's food security. To design appropriate policy response, there is need for solid and up-to-date information about the food insecurity situation in the specific contexts. Here we analyze prevalence and correlates of undernourishment among urban households in Nigeria, using recent survey data. Food consumption data were collected, based on the 24 hour food recall, from selected urban households in the Jos Metropolis, Plateau State, Nigeria. The results show that the average daily per capita calorie intake is low in the area, and about 52% of the households are under-nourished, falling short of the recommended minimum calorie intake level by 8.2% on average. Contrary to expectation, under nourishment is more prevalent among male-headed households. There is positive and significant association between food security and household income, lending support to conventional wisdom that income growth can help to reduce food insecurity. Consequently, food security strategies should also include measures to ensure increased earnings for the poor households to enable them increase their calorie intake and nutrition. In addition, our results show that household assets affect per capita calorie intake in a positive and significant way, suggesting that sustained asset accumulation by poor households may play an important role in improving their food security status.

Keywords: Calorie intake, food insecurity, Jos Metropolis, urban households, 24-hour food recall

1. Introduction

For a long time food insecurity had been thought to be a predominantly rural problem and various international aid agencies, whose objectives include eradicating food insecurity, have concentrated on the rural areas. Recently however, the world's population is becoming increasingly urbanised and this poses new challenges for food security in urban areas of the world. For example, in 1950, 30% of the world's population lived in urban areas, by 2002, that figure had increased to 47% (UNO, 2002). Over three-quarters of the population of industrialized countries now live in urban areas, while rural to urban migration in developing countries is increasing at a rapid pace. In Sub-Saharan Africa, approximately 34% of the population currently lives in urban areas and by 2020, it is estimated that nearly half (46.2%) of the population will be urbanized (UNO, 2001).

The rapid increase in urbanization in developing countries of the world brings about great challenges for assuring urban household's food security (Kennedy, 2003). The recognition of these challenges has prompted national government and international aid agencies to seek appropriate food security strategies for combating food insecurity among urban households.

* Corresponding Author. E-mail: ralphag20@yahoo.com

In the designs of such food security strategies, government and donor agencies are concerned about whether the conceptual framework and programmes meant for the rural areas can simply be transferred to urban areas (Garrett and Ruel, 1999). In other words, are the same factors responsible for food security in rural and urban areas? Furthermore, should similar food security strategies be adopted for the rural and urban areas? Kennedy (2003), is of the opinion that the factors which influence food security differs across urban and rural areas, and therefore the study suggested that urban planners and policy-makers should recognise these differences in the design of programmes to meet the food needs of the urban poor.

Several studies have analyzed food insecurity in Nigeria (e.g. Agboola *et al*, 2004; Akinsanmi, 2005; Amaza *et al*, 2008; Babatunde *et al*, 2007a; Babatunde *et al*, 2007b; Babatunde, 2009; Olayemi, 1998), however, most have focussed mainly on food insecurity in the context of rural areas. The few available studies that analyzed urban food security are not based on actual food consumption survey. This is considered a research gap. Here, we address this gap through empirical analyses. The study analyzes urban food insecurity using a recent food consumption and expenditure survey data of households selected from Jos Metropolis, Plateau State, Nigeria. The study has two main objectives. First, it analyzes the prevalence of under nourishment among the sample of urban households, and second, it identifies the determinants of urban food security using a multivariate econometric analysis. Knowledge of the prevalence and determinants of urban food insecurity is important considering the recent global increase in food prices and its attendant effects on urban food security. More broadly, the results of the study could provide valuable information that could be useful for the design of policies and programmes to improve food security among urban households in Nigeria.

The remaining parts of the paper are organized as follows. Section 2 provides a brief discussion on the concept of food security and the extent of food insecurity in Nigeria. Section 3 describes the household's survey data and the setting in the study areas, including sample characteristics and some preliminary descriptive results of calorie intake and prevalence of under nourishment. The results of the multivariate analysis are presented in section 4 while section 5 concludes the paper with policy implications.

2. FOOD INSECURITY SITUATION IN NIGERIA

Food security has been defined as a situation when all people, at all times, have physical and economic access to sufficient, save and nutritious food needed to maintain a healthy and active life (FAO, 1996). This definition implies that food security is a broad concept that is more than food production and food accessibility.¹ In reality it revolves round four pillars namely, food availability, food accessibility, nutritional factors and stability of food supply (Gross *et al*, 1999). The implication of this definition is that, achieving food security requires that the aggregate availability of physical supplies of food is sufficient, that households have access to those food supplies through their own production, through the markets (given sufficient purchasing power) or through other sources, and that the utilization of those food supplies is appropriate to meet the specific dietary needs of individuals households or individuals in the households. Food accessibility is ensured when all households and all individuals within those households have sufficient resources to obtain appropriate foods for a nutritious diet. It is dependent on the level of household's resources-capital, labour and knowledge and prices.

Among the developmental problems facing Nigeria, food insecurity rank topmost. The level of food insecurity has continued to rise steadily since the 1980s. It rose from about 18% in 1986 to about 41% in 2004 (Sanusi *et al*, 2006). The daily per capita calorie intake as a proportion of recommended requirement was 90% between 1988-1990 and 85% between 1992-1996 (FOS, 1999). According to FAO (2000), Nigeria was able to reduce the prevalence of under nourishment by more than 30% between 1979-1981 and 1996-1998. The prevalence dropped from 44% to 8% between these periods.² However, the average per capita daily calorie intake remained 2050 kcal during the 1979-1981 periods while the diet comprised of 64% cereals and root and tubers (Agboola *et al*, 2004). National food expenditure data showed that almost two thirds of total expenditure of households in 1980 was on food. This food share rose by about 10% points by 1985, but dropped during the period 1985-1992. In subsequent four year period, 1992-1996, a further drop of 5% points took place. The figures were 63.4%, 74.1%, 72.8% and 63.6% for 1980, 1985, 1992 and 1996 respectively. Also, trends in poverty reveal that the incidence of poverty increased sharply both between 1980 and 1985 and between 1992 and 1996. The figures were 27.2%, 46.3%, 42.7% and 65.6% for 1980, 1985, 1992 and 1996 respectively. The figure for 1996 was translated to 67.1 million (Agboola *et al*, 2004). The overall national average household income in 1996 prices indicate a very significant downward trend, moving from

¹ To support this line of argument, there are some countries in which there is sufficient aggregate food production and high per capita income, yet, a sizeable proportion of the population are under nourished. Some countries in Eastern Europe and Oceania fall into this category.

² An important factor for this was the rapid increase in the supply and multiplication of cassava products during the period, which benefited mostly the poor and under nourished people.

₦13,454 in 1980 to ₦6,252 in 1996, over 50% reduction. The average household in the rural areas earned ₦5,590 (FAO, 2000).

Recently however, Nigeria made some progress in the areas of per capita daily calorie intake and was able to reduce the proportion of under nourished people. The per capita daily calorie intake increased from 2050 kcal in 1979-1981 to 2430 kcal in 1989-1991 and to 2700 kcal in 2000-2002. Though cereals, root and tubers accounted for 65.3% of the diet in 2000-2002 compared to 64% in 1979-1981 periods (FAO, 2004). The figure represents an 11% increase in per capita daily calorie intake between 1991 and 2002. Also the proportion of under-nourished people decreases from 13% in 1990-1992 to 9% in 2000-2002 (FAO, 2005).

3. DATA AND SETTING

3.1 Study Area and Setting

This study was conducted in Jos Metropolis, the capital city of Plateau State, north-central Nigeria. Plateau State, often referred to as the “home of tourism”, derived its name from the Jos Plateau. Plateau State is an agrarian state, with a land size of about 26,899 km² and majority of the population practise farming on different scale. There are about 35 different ethnic tribes, with the “Berom”, “Rukuba”, “Taroh” and “Jarawa” as the dominant ones. Jos Metropolis is made up of three local government areas namely, Jos-North, Jos-South and Jos-East local government areas. Jos Metropolis has a total population of about 800,000 inhabitants with a population density of about 400 people per square kilometre (NPC, 2006). Because of its very high altitude which is put at between 1200 and 1700 metre above sea level, Jos Metropolis has a very cold climate with temperature sometimes falling to 15°C. The cold climate in Jos Metropolis coupled with its fascinating landscape and museums, makes it attractive to both tourists and foreigners. Apart from farming, Tin mining is also very popular in Jos Metropolis. Tin mining was the major factor responsible for the migration of people, both indigene and foreigners to Jos Metropolis. Since the era of colonial rule, Jos Metropolis has been called the “Tin City”. As mentioned earlier, farming is the dominant occupation in Plateau State, however, a sizeable proportion of the inhabitants are traders and small-scale business operators. Indeed the largest single market in Nigeria is located in Jos (PLSG, 2005). In addition to the vibrant non-farm sector of Jos Metropolis, urban agriculture is very popular. Food crops such as carrots, potatoes, lettuce, cabbage, yam, millets, maize, guinea-corn are produced in large quantity in the Metropolis (Ndulue, 2007). Despite the favourable climatic condition of Plateau State, food security and calorie availability in Jos Metropolis have continued to fall in the last one decade, and the nutritional status in the area is still very low (Gyan, 2005). Poverty prevalence in Plateau State increased from 10% to 19% in 2005 and the standard of living in Jos Metropolis is low compared to other major cities in Nigeria (Gyan, 2005). These declining fortunes make Jos Metropolis an interesting site for this type of study.

3.2 Data and Sample Characteristics

Data used for this study were obtained from a comprehensive food consumption and expenditure survey of 120 urban households, selected from Jos Metropolis, Nigeria. The data was collected in the summer of 2007. A multi-stage random sampling technique was used in selecting the sample households. From the three local government areas of Jos Metropolis, a number of wards were selected using the proportionality factors. From each selected ward in stage one, a random selection of 8 households was carried out. This makes a total of 40 households from each of the three local government areas and a total of 120 households for the entire sample size. A standardized questionnaire was used in collecting the data. The questionnaire covered information on household food consumption, expenditure and income. Though household's heads and other members were present during the interview, the interview was carried out with the member of household in-charge of food preparation. Information on household's living condition and coping strategies were also collected.

The food consumption data employs a 24-hour recall period and include about 102 food items. The 24-hour recall method helps to minimise error due to omission or addition, since a very short recollection time is required. Secondly, it gives the researcher the liberty of conducting the interview when the household is not expecting it, and this reduces the level of error. On the contrary however, one major limitation is that it is a snapshot method and can not account for dietary diversity. Also, it does not takes into account the seasonality effect on food intake and can sometimes lead to overestimation of food expenditure, given that some food items are only purchased on ceremonial periods.

From the 24-hour food consumption recall data, we estimated the quantity of every food items consumed by the household in the last 24 hour - from own-production, market purchase and out-of-home consumption. The food quantities were converted to calorie value using the locally available food composition table (Oguntona and

Akinyele, 1995), supplemented by the USDA table where necessary.³ The total household calorie intake is divided by the number of household member to obtain the daily per capita calorie intake of each household.

Table 1: Selected Sample characteristics

Characteristics	Percentage
<i>Gender of household head</i>	
Male	55
Female	45
<i>Household size</i>	
1- 4	27.5
5 – 9	62.5
More than 9	10.0
<i>Education of household head</i>	
No formal education	7.6
Primary education	20.8
Secondary education	28.3
University education	43.3
<i>Primary occupation of household head</i>	
Farming	17.0
Unskilled wage labour	7.0
Skilled wage labour	17.0
Civil service	14.0
Self employment	37.0
Others	8.0
<i>Major source of energy for cooking</i>	
Electricity	4.2
Gas	3.3
Kerosene	52.5
Firewood	12.7
Coal	27.3
<i>Major source of drinking water</i>	
Borehole water	11.0
Pipe-borne water	33.0
Well water	50.0
Purchased water	6.0
<i>Major method of refuse disposal</i>	
Local refuse dump	45.0
Government refuse dump	10.0
Refuse buried	14.0
Refuse burnt	31.0
<i>Ownership of present accommodation</i>	
Own house	44.0
Family house	14.0
Rented house	42.0
<i>Type of wall used for the house</i>	
Mud bricks	4.7
Burnt bricks	14.2
Concrete block	81.1
<i>Type of floor used for the house</i>	
Iron roof	90.4
Concrete roof	3.9
Asbestos roof	5.7

Source: Urban household sample survey, 2007

³ The locally-available food composition table has been shown to be better and the United State Department of Agriculture (USDA) food composition table should only be used when there is no locally-available table. This is because of some food that are known to have little variation in calorie composition across countries (Smith, *et al.*, 2006)

Selected characteristics of the sample households are presented in table 1. More than half of all the households are headed by men while the remaining ones are headed by women. Nearly two-third of the households has between 5 and 9 people and about one-tenth had more than 9 people in the household. The average household size is about six. Education status of household heads reveals that about 90% have some forms of formal education and majority of the educated heads have University education. Less than 10% have no formal education. This is quite interesting as education has been identified as an important factor for household food security and nutrition (Armar-Klemesu *et al*, 2000). Individuals and households that are educated know the importance of balanced diets, and they always try to seek nutritious and high-quality food that would improve their nutritional status.

Only 17% of the household derive their primary livelihood from farming, while the rest are engaged in different self-employment, wage employments and civil service. This buttressed the choice of the area as truly representing urban environment. Kerosene is the dominant source of energy for domestic cooking among the households and well water is the major source of drinking water. About 55% of the household dispose their waste through refuse dump while 45% either burn or bury their domestic waste. Fifty-eight percent of the households are either living in their own house or in family houses, but 42% live in rented apartment. Majority of the houses (81.1%), are made of concrete block and corrugated iron roof is the dominant type of roof in the Metropolis.

3.3 Calorie Intake and Prevalence of Undernourishment: Preliminary Result

As mentioned earlier, daily per capita calorie intake of each household was obtained from the 24-hour food consumption data.⁴ A household in which the daily per capita calorie intake is equal or greater than the recommended minimum calorie intake of 2250 kcal is regarded as food secure and those one where the daily per capita calorie intake is less than the minimum requirement are regarded as food insecure.⁵ Based on this, the prevalence of food insecurity, the headcount ratio and the depth of calorie intake deficiency were estimated according to the formula given below:

$$Z_i = \frac{Y_i}{R} \quad \text{..... (1)}$$

Z_i = food security status of i th households which take value 1 for food secure households or 0 for food insecure households.

Y_i = daily per capita calorie intake of i th household

R = recommended per capita daily calorie intake (2250kcal)

Z_i = 1 for Y_i greater than or equal to R

Z_i = 0 for Y_i less than R

$$\text{Calorie intake deficiency} = \frac{1}{M} \sum_{i=1}^m G_i \quad \text{..... (2)}$$

Where:

M = number of food insecure households

G_i = per capita calorie intake deficiency for i th household

$$G_i = \frac{(Y_i - R)}{R} \quad \text{..... (3)}$$

$$\text{Headcount Ratio (H)} = \frac{M}{N} \quad \text{..... (4)}$$

N = the number of households in the sample

Table 2 shows the distribution of households by food security indices. The results in table 2 reveal that the average per capita daily calorie availability is about 2269 kcal. About 52% of all households are under nourished, falling below the minimum recommended daily per capita calorie intake by 8.2% on average. This result shows that

⁴ We use calorie supply, calorie availability and calorie intake interchangeably, but because we build on food expenditure data, what we measure was actually household calorie supply.

⁵ The actual minimum calorie requirement of individuals depends on their age, sex, body size, activity level and physiology. To determine the minimum calorie need of a group of individuals, given unknown requirement - because of individual variations, FAO/WHO/UNU (1985), recommends the use of average calorie requirement for people of different sex, age and activity level. In this study, we used a minimum household per capita calorie intake of 2250 kcal/day.

although calorie intake in the area is comparable to recent estimates obtained from elsewhere in urban Africa, it is lower than the minimum calorie intake recommended by the Food and Agriculture Organization for an adult male (see Smith *et al.*, 2006). The result suggests that much still needs to be done to improve the calorie intake of urban households in Nigeria. Policies that would ensure increased food production and income for the urban households should be pursued vigorously, to enable them increase their calorie intake.

Our result also indicates that under nourishment is higher among households with older heads. This is expected, young people are stronger and are expected to cultivate larger-size farm and earn more income for food consumption than old people. In addition, we find that under nourishment is more prevalent among larger households in the sample area. This is not surprising as excessive food fragmentation in larger households often leads to inadequate per capita calorie availability. It is therefore important for government to put in place good population enlightenment programmes to sensitize urban dwellers on the need to adopt family planning techniques which will reduce the number of children to that which the household can adequately cater for.

Table 2: Calorie intake and Food Security Indices of Urban Households.

Indices	Food Secure	Food Insecure	Total
All Households			
Per capita daily calorie availability	2478.0	2066.0	2268.6
Number of households	59	61	120
Headcount ratio	49.2	50.8	100
Age of household head	40.8	47.3	43.9
Household size	6.1	6.3	6.2
Prevalence of undernourishment (%) ^a	-	51.5	51.5
Depth of calorie deficiency (%) ^b	-	8.2	8.2
Male-headed households			
Number of households	25	41	66
Headcount ratio	37.8	62.1	100
Age of household head	50.1	42.2	45.2
Household size	6.5	6.5	6.5
Prevalence of undernourishment (%) ^a	-	69.3	69.3
Depth of calorie deficiency (%) ^b	-	7.6	7.6
Female-headed households			
Number of households	34	20	54
Headcount ratio	62.9	37.0	100
Age of household head	45.3	37.8	42.5
Household size	5.9	6.0	5.9
Prevalence of undernourishment (%) ^a	-	30.7	30.7
Depth of calorie deficiency (%) ^b	-	9.2	9.2

Source: Urban household sample survey, 2007

(a) Percentage of households that falls short of the minimum daily per capita calorie intake.

(b) This is the level of calorie intake deficiency among the food insecure households only.

Further disaggregation of the data shows that, while 31% of the female-headed households are food insecure, the prevalence is 69% among male-headed households. This result is contrary to the result of Omonona and Agoi (2007), which found the prevalence of food insecurity to be higher in female-headed than in male-headed households. The reason for the low incidence of food insecurity among female-headed households in the area could be because women spend more of their income on food consumption and they direct their resources towards ensuring household food security (Quisumbing *et al.*, 1995; Kojo, 2003). What is needed therefore, is to empower and sensitize men in urban households to devote more of their income to household food consumption and nutrition, so as to improve the overall calorie intake.

4. MULTIVARIATE ANALYSIS

4.1 Model estimation

In this section, we used econometric approach to analyze the determinants of urban food security. For this purpose, two models were estimated. In the first model, a Probit regression was estimated. The dependent variable -

household's food security status, is a dummy and it equals 1 for food secure households and 0 for food insecure households. In the second model, an Ordinary Least Square (OLS) regression was estimated. The dependent variable in this model is household's daily per capita calorie intake. The same set of independent variables were used in the estimation of both models. Econometric tests show that there are no serious problems of endogeneity and multicollinearity among the explanatory variables included in the models.

The implicit form of the Probit and OLS model are respectively expressed as:

$$Z_i = \beta X_i + U_i \quad \dots\dots\dots (5)$$

$$Y_i = \delta X_i + U_i \quad \dots\dots\dots (6)$$

- Z_i = the food security status of *ith* household
- Y_i = daily per capita calorie intake of *ith* household
- X_i = vector of explanatory variables
- U_i = the error term
- β = vector of the parameter estimates of the Probit model
- δ = Vector of parameter estimates of the OLS model

The independent variables included in the estimation take into consideration typical contextual and socioeconomic characteristics of the households. The definition and *apriori* expectation of the explanatory variables are discussed below:

(a) Age of household head

The age of household's head in year is expected to have impact on his labour supply for food production. It is also expected to have impact on ability to seek and obtain off-farm jobs and income, which could improve total household income. Young people are stronger and are expected to cultivate larger-size farm than old people. However, the expected effect of age on food security could be positive or negative.

(b) Gender of household head

This is measure as a dummy and it equals 1 if the household head is male and 0 if the household head is female. The *apriori* effect of this variable on household food security status is not very clear, and therefore the expected effect could be positive or negative.

(c) Education status of household head

Education is a social capital, which could impact positively on household ability to take good and well-informed production and nutritional decisions. Some scholars have argued that spouse education could be more important in food security than household's head educational status. The variable is measured as the number of years of schooling of the household head and the expected effect on food security status is positive.

(d) Household size

This is the number of individual members in the household. Since food requirements increase with the number of persons in a household, the expected effect is negative. Excessive food fragmentation result in lower per capita food supply in larger families.

(e) Dependency ratio

This is the amount of dependants in the household divided by the number of working adults. A household with a very high dependency ratio indicates that lesser hands are working, while many people are just consuming. The expected effect of this variable on food security status is negative.

(f) Household assets

This refers to the sum total of the household network. Assets are useful source of cash income that the household can depend upon in times of unexpected fall in income. Household initial wealth can be viewed from the perspective of providing finance for maintaining and sustaining the production process such as hiring labour, purchasing fertilizer etc. Also, assets are good collateral for securing production or consumption loan. The expected effect of household assets on food security status is positive.

(g) Farm ownership

This is the possession of a farm by the household. It is measured as a dummy and it equals 1 for households that have a family farm and 0 for household without a family farm. Produce from the family farm can help to solve urgent problem of food scarcity especially at the immediate post-harvest period. The expected effect of farm ownership on food security status is positive.

(h) House ownership

This is a measure of whether the household has an accommodation of their own or not. It is an indication of household standard of living and wealth. When a household has an accommodation of its own, it could reduce the expenses on house rent. Likewise, a family accommodation could be rented out to earn additional income, which could be use for purchasing more food. It is measured as a dummy and it equals 1 for households that have a house and 0 for household without a house. The *apriori* effect of this variable on household food security status is positive.

(i) Total household expenditure

This is a proxy for household income. It is expected that income level would determine access to food, the composition of diet and access to other services, which have direct impact on the nutritional condition of the household. The expected effect of this variable on household food security status is positive.

4.2 Estimation results

The results of both models and the accompanied statistics are shown in table 3. The model performances for the two estimations are good with 0.811 pseudo- R^2 and 0.479 R^2 for the Probit and OLS model respectively. Looking at the result in table 3, we found that the coefficient of age of household head is negative and significant in the Probit model. This implies that households with older heads are more likely to be food insecure, since the probability of food security decrease with age.⁶ This result is probably due to the fact that, as the household heads get older, little energy is available to them for engagement in productive activities on and off the farm. This automatically reduces the income and access to sufficient food by the households.

Household size has a negative and significant effect on the probability of household food security in the two models. This is consistent with the finding of Omonona and Agoi (2007). The implication of this result is that larger households are more likely to be food insecure. This is not surprising, because excessive food fragmentation in larger households result in low daily per capita calorie intake. In addition, there is higher dependency ratio among larger households, and this cause insufficient per capita calorie intake. Efforts should be made to sensitize the households on proper family planning methods, which will reduce the number of children to the number that the household can adequately cater for.

Household asset has a positive and significant effect on household food security in the two models. In other words, the higher the value of household assets, the higher the probability of food security and vice-versa. Asset is a form of security on which the household can depend in times of unexpected fall in income. Households with little assets are therefore at a disadvantage, since they become more vulnerable to food insecurity in times of unexpected fall in income. Household income, proxy by total expenditure, has a positive and significant effect on household food security. Increase in income will increase household access to more and high quality food, thereby improving household calorie intake. However, the extent to which income increase will improve food security depends on household consumption patterns. The implication of this result is that food security policies for urban households should include also, measures to ensure increased earnings for the very poor to enable them increase their calorie intake.

Table 3: Determinants of Urban Food Security

	Food security status		Calorie intake	
	Probit model		OLS model	
	Coefficient	t-value	Coefficient	t-value
Constant	-7.491***	-3.23	1926.273***	18.94
Age	-0.140**	-2.12	-2.206	-0.81
Gender	-0.731	-1.31	-45.941	-1.35
Education	0.106	1.59	2.851	0.85
Household size	-0.520**	-2.26	-19.876*	-1.73
Dependency ratio	-0.068	-0.19	1.022	0.05
Assets	0.011***	3.13	0.463***	4.43
Farm ownership	0.395	0.58	27.165	0.82
House ownership	0.380	0.59	1.983	0.05
Total expenditure	2.254E-04***	3.59	0.083***	4.43
Pseudo- R^2	0.8115			
R^2			0.479	

Notes: The number of observations in the two models is 120. *, **, *** indicate statistically significant at the 10%, 5%, and 1% level, respectively.

5. Conclusion

While most food insecurity studies have focused on the rural areas, there are comparatively less empirical studies on food insecurity among urban households in Nigeria. In this paper, we analyzed calorie intake and determinants of

⁶ This result is in agreement with the result shown in table 2, which indicates that under nourishment is more prevalent among households with older heads.

urban food security. The analysis utilizes a food consumption and expenditure survey data collected in 2007 from Jos Metropolis, Plateau State, Nigeria. First, we carried out a 24-hour food consumption recall and determined the prevalence of under nourishment among the sample households. In the second analysis, we examined the correlates of urban food security using multivariate econometric analysis.

We found that the average daily per capita calorie availability of the households is 2269 kcal. While 45% of the households are food secure, 52% are under nourished. The under nourished households, fall short of the recommended minimum daily per capita calorie intake by 8.2% on the average. A disaggregated analysis of the data reveal that more of the male-headed households are under nourished compared to their female-headed counterparts. In addition, smaller households and those with younger heads are more food secure than larger households and those with older heads.

The first policy implication of the results is that there is need to sensitize and empower men in urban households to devote a substantial part of their income to food consumption, this is because our results show that under nourishment is more prevalent among male-headed households. Many studies have submitted that income available to men is often not available for food consumption and this could explain why more households headed by men are food insecure. Conscious campaign and enlightenment programmes will help to change the situation, so as to guarantee more food for the whole households.

Second, since food insecurity incidence increases with increase in household size, efforts should be made to educate urban households on proper family planning techniques, which will reduce the number of children to that which the household can adequately cater for. Third, increase in income improves calorie intake among urban households; therefore, it is important that comprehensive food security strategies should also include measures to ensure increased earnings for the very poor households to enable them to increase their overall calorie intake and nutrition. However, it should be noted that the extent to which calorie consumption will change with increasing income will depend on the consumption pattern of the households. If households choose to substitute more expensive sources of calorie for cheaper ones, their calorie consumption and overall nutrition may increase appreciably.

Finally, our results demonstrate that growth in household asset will increase calorie intake and food security, therefore a flexible asset building strategies should be encouraged among urban households. Loans from government and cooperative societies could be used for asset build-up. Likewise, personal savings should be encouraged among urban households so that they could depend on it in times of unexpected decline in income.

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