

FOOD CONSUMPTION PATTERN IN OGBOMOSO METROPOLIS OF OYO STATE, NIGERIA

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ABSTRACT

The study shed light on food consumption pattern in Ogbomoso Metropolis using Almost Ideal Demand System. Information on different classes of food consumed by the household was obtained using a multistage random technique. The result showed that demand for root and tubers and vegetables are elastic than demands for the other classes of food considered in this study. Also, legume has the most inelastic own- price elasticity among other food items considered in the study. This indicates that households in Ogbomoso metropolis are insensitive to changes in the price of legumes. Expenditure elasticities of all the food items were examined and were found to be less than one. All the food items are expenditure inelastic with root and tubers and fruits having the highest expenditure followed by animal protein, cereals, legumes and vegetables respectively. This implies that despite being staple foods, the consumption of each of these will decline as per capita income increases, this finding is counter intuitive. The highest expenditure elasticity is found for the fruits, suggesting that its demand will grow faster than the demand for the other products as the economy develops and income increases

Key words: food consumption pattern, expenditure elasticities

INTRODUCTION

Food is a basic human need and the major source of nutrients needed for human existence. Various foods serve as important “vehicles” for taking nutrients into the body and bringing about human pleasure, hence, the need for food not only to be taken in the right quantity but also the quality. To measure the quality of food taken, there are classes of essential nutrients, which must be combined, in appropriate proportion to ensure a balanced food intake. These include carbohydrates, protein, fats and oil, vitamins and minerals [Adeyeye, 1992] and is ingested and assimilated by an organism to produce energy, stimulate growth, and maintain life. Almost all foods are of plant or animal origin. Other foods not from animal or plant sources include various edible fungi, especially mushrooms: Fungi and ambient bacteria are used in the preparation of fermented and pickled foods such as leavened bread, alcoholic drinks, cheese, pickles, kombucha and yogurt. Blue-green algae such as Spirulina (McGee,2004) Inorganic substances, baking soda, cream of tartar are also used to chemically alter an ingredient.

While global food demand, especially in developing countries, is expected to increase with income, the food share of total budget is expected to decline as income increases. As population grows, food demand also grows. With increasing income and urbanization, demand for food not only increases, but changes with shifts in consumption patterns (Helene,1990).

Consumers worldwide faced rising food prices as it was reported on March 24, 2008. Reasons for this development are freak weather, dramatic changes in the global economy, including higher oil prices, lower food reserves and growing consumer demand (CNN, 2008).

Although food is one of the basic human needs, it has been a great challenge for many nations to bridge the gap between food production and its demand. The number of people consuming less than the nutritional requirement of 2,100 calories per day in sub-Saharan Africa was estimated at 337 million in 2001. This amount to 57 percent of the population of the region (Rosen and Shala, 2002). Studies showed that the world population could reach eight billion by 2025. Nearly all of the increase of two billion people in the next 25 years will be in the developing countries (McCalla, 2001). Food and nutrition are basic human rights because they are necessary inputs for human development. Over the years, various food cultures and consumption patterns have emerged. In Nigeria, different food types are associated with different ecological regions and ethnic groups. For instance, the Fulanis are highly noted for dairy and meat consumption, while the Ibibios are noted for high consumption of starchy and sea foods. Malnutrition is the major contribution to illness and disease in the world (Ezzati, *et al.*, 2002).

Food consumption patterns can be defined as the recognizable ways of eating foods. Rural dwellers tend to adhere to their old eating patterns rather than venturing to seek new and more proper eating habits. In order to maintain healthful diets, Jama (2002) asserts that a variety and balance of foods from all food groups and moderate consumption of all food items is very important. The importance of food in any country cannot be overemphasized. There is in fact a growing concern in the world today that food production increases are not kept within pace with the phenomenal increase in population in developing countries such as Nigeria. Specifically, activities in areas of food production (including livestock and fishing), processing and marketing account for approximately 80% by value of Nigeria's total agricultural output. Despite the apparent significance of food to the Nigerian agricultural economy, the food intake in the country has been found to be inadequate not only in terms of quantity but also in terms of quality. For instance, the FAO report indicated recently that about 97% of the daily Calorie requirement is met by the Nigerian consumer when viewed from the average dieting standards in the developing countries of Western Europe, where supplies exceed requirements by a margin of 26% (Anita Regmi *et al.*, 2008).

The structure of Nigerian consumption has been undergoing a dramatic change for some years now. There was a decrease in dietary energy consumption (9kcal per caput per day) for the periods 1990-1992,1995-1997,2001-2003 that was put at 2540,2750 2700 respectively. Also there was a decrease in dietary protein consumption (gm per caput per day) for the period of 1995-1997 and 2001 -2003. The per caput protein intake was 62 between 1995-1997 but dropped to 61 between 2001 and 2003 (Olorunfemi and Ajibefun, 2007).

In view of the above, this study therefore examined the food consumption pattern of the inhabitants of Ogbomoso metropolis

METHODOLOGY

The data for this study were obtained from Ogbomoso Metropolis of Oyo State Nigeria. Ogbomoso metropolis consists of two local government areas, they are, Ogbomoso north and Ogbomoso south. The population of the study consists of the household consumers of different food classes such as cereals, legumes, vegetables, roots and tubers etc. Multi-stage sample

random sampling procedure was used for the study by stratifying the study area into two local government areas. The study area was divided along the current political wards to form strata. Ten strata (wards) out of the twenty strata (wards) in the study area (5 from each LGAs) were randomly selected. From each stratum, twenty households were randomly selected making a total of 200 households. Data on household consumption expenditure pattern were collected at intervals of two weeks for four months.

The study employed the Almost Ideal Demand System (AIDS) developed by Deaton and Muellbauer (1980). The model is flexible enough to allow the assumptions of homogeneity and symmetry to be tested or successfully imposed during empirical analysis. It is easy to estimate, gives arbitrary first order estimation to any demand system, and satisfies the axioms of choice. Many of these good attributes have contributed tremendously to the application of the model to demand equation estimation in many parts of the world e.g. Raper *et al.*, (2002) and Dong *et al.*, (2004).

The AIDS model can be specified as

$$w_i = \alpha_i + \sum_j^n \gamma_{ij} \ln P_j + \beta_i \ln \left(\frac{X}{P} \right) + e_i \quad (1)$$

where w_i = budget share of i th commodity

defined by $\frac{P_j Q_i}{X}$

P_j = price of j th commodity within the group

γ_{ij} = estimated coefficient of prices

β_i = estimated expenditure coefficient

X = total expenditure on the group of goods being analyzed

P = price index for the group

The price index can be further defined as:

$$\ln P = \alpha_0 + \sum_k \alpha_k \ln P_k + \frac{1}{2} \sum_j \sum_k \gamma_{jk} \ln P_k \ln P_j \quad (2)$$

The price index makes equation 1 to be non-linear. In order to linearize it, the Stone's index was incorporated.

$$\ln p = \sum w_j \ln p_j \quad (3)$$

Homogeneity, symmetry, and adding up are respectively imposed on the system through the following parameter restrictions:

$$\sum_j \gamma_{ij} = 0; \gamma_{ij} = \gamma_{ji}; \sum_i a_i = 1; \sum a_{is} = 0; \sum \beta_i = 0; \sum \gamma_{ij} = 0. \quad (4)$$

Following Chalfant (1984) and Ahmed and Shams (1994), the Marshallian and Hicksian elasticities are computed from the estimated parameters of the Linear Approximation AIDS model (LAAIDS) in equation 4 as follows;

Marshallian (Uncompensated)

$$\varepsilon_{ij} = -1 + \left(\frac{\gamma_{ij}}{w_i} \right) - \beta_i \quad (\text{own- price}) \quad (5)$$

$$\varepsilon_{ij} = \left(\gamma_{ij} / w_i \right) - \beta_i \left(w_j / w_i \right) \quad \text{(cross-price)} \quad (6)$$

The expenditure elasticity is derived as

$$E_i = -1 + \beta_i / w_i \quad (7)$$

RESULTS AND DISCUSSIONS

Following Deaton and Muellbauer (1980), the demand equation for each of the food items were estimated without imposition of restrictions. The results of the analysis are presented in Table 1 and the test of homogeneity carried out. The result of the tests showed that in all the food items, homogeneity condition is significantly violated. This result is in line with the findings of Deaton and Muellbauer (1980); Ahmed and Shams (1994) and Awoyemi *et al.*, (2006).

Table 1 further showed that all the Durbin-Watson statistics were within the plausible region. In all, one can effectively say that the dependent and independent variables have effectively performed their role. In the first equation using the budget share of root and tubers as the dependent variable, it was clear that five of the variables were significant at 1 percent and 10 percent respectively. This shows that as the household expenditure increases, there is a decrease in the budget share to root and tubers while as the price of legumes, cereals and vegetables increases the budget share of root and tubers increases. There is also a direct relationship between the price of root and tubers and its budget share. A one percent increase in the prices of legumes, cereals and vegetables will lead to 0.41%, 0.51% and 0.18% increase in their budget share respectively.

For legumes as the second equation, three independent variables were significant which are the prices of legumes, root and tubers and total food expenditure respectively at 1% and 10% levels. This shows that a 1 percent increase in the price of root and tubers led leads to a 0.12% decrease in budget share of legume in the home. For cereals as the third equation, two of the variables were significant which are the price of cereals and total food expenditure respectively at 1% level. There is also a direct relationship between the price of cereals and its budget share.

For vegetable as the fourth equation, four of the variables were significant at 1% and 5% receptively. The significant variables are the prices of root and tubers, vegetables, fruits and total food expenditure. There is an inverse relationship between the prices of root and tubers, fruits and total food expenditure and the budget share to vegetables. This indicates that a 1 percent increase in the prices of root and tubers, fruits and total food expenditure leads to a 0.20%, 0.23% and 0.47% decrease in the budget share to vegetables.

For fruits as the fifth equation, four of the variables were significant which are price of fruits, root and tubers, legumes and total food expenditure respectively at 1% and 5% levels. This shows that a 1 percent increase in the prices of root and tubers, legumes and total food expenditure leads to a 0.22%, 0.17% and 0.38% decrease in their budget share to fruits respectively. For animal protein as the sixth equation, three of the independent variables were significant which are the prices of animal protein, fruits and total food expenditure. There is also an inverse relationship between the price of fruit, total food expenditure and the budget share to animal protein.

All expenditure parameters are significant at the 1% level

Table 1: The Unconstrained Parameter Estimates and Test of Homogeneity

Commodity	Constant	γ 11 Root and tuber	γ 12 legume	γ 13 cereal	γ 14 vegetable	γ 15 fruit	γ 16 animal protein	Expenditure	R ²	DW
Root and tuber	-0.571 (-5.304)	0.602*** (6.767)	0.405*** (3.240)	0.51*** (3.502)	0.180* (1.724)	0.0144 (1.465)	0.00371 (0.284)	-0.442*** (-14.022)	0.518	1.67
Legume	-0.889 (-9.337)	-0.124* (-1.850)	0.165*** (15.598)	0.137 (1.146)	0.784 (0.009)	0.437 (0.535)	-0.425 (-0.405)	-0.481*** (-16.093)	0.679	1.97
Cereal	-0.540 (-9.337)	-0.227 (-0.157)	-0.177 (-0.800)	0.164*** (6.559)	0.214 (1.180)	-0.823 (-0.475)	-0.265 (-1.174)	-0.573*** (-11.188)	0.530	1.56
Vegetable	-0.770 (6.530)	-0.203*** (-2.180)	-0.178 (1.272)	0.215 (1.302)	0.162*** (13.644)	-0.230** (-2.080)	-0.174 (-1.205)	-0.468*** (-13.412)	0.715	1.72
Fruit	-0.575 (-8.229)	-0.219*** (-4.224)	-0.168** (-2.145)	0.954 (1.069)	0.795 (-1.223)	0.144*** (21.969)	-0.153 (-0.188)	-0.384*** (-16.795)	0.786	1.66
Animal Protein	-0.903 (-3.508)	-0.192 (0.861)	0.389 (1.091)	0.258 (0.639)	0.594 (0.211)	-0.524** (-1.973)	0.169*** (4.360)	-0.783*** (-8.470)	0.508	1.87

Source: Field Survey, 2009

Note: Values in parenthesis represents t-values,

*** represent significant at 1% level,

** represent significant at 5% level,

* represent significant at 10% level

Own Price and Cross Price Elasticities

From Table 2, all the estimates of own price elasticities conform to the law of demand with negative signs. Using the estimated coefficients, uncompensated price and expenditure elasticities are evaluated at the sample means. Own-price elasticity for root and tubers is -0.996 and that of vegetables is 0.995, which is relatively more elastic than that for other groups. This result indicates that demand for root and tubers and vegetables are elastic than demands for the other groups.

It is surprising that the own price elasticity for all food items are below 1 in absolute terms. If the absolute value is considered, the lowest estimates of own price elasticity for all the food items are found in legumes (-0.038), followed by vegetables (-0.0995), fruits (-0.191), cereals (-0.446), animal protein (-0.577) and root and tubers (-0.996). For this table, legume has the most inelastic own- price elasticity among other food items considered in the study. This indicates that households in Ogbomoso metropolis are insensitive to changes in the price of legumes. That is, if the price of legume comes down or there is an increase in the per capita income of the household, consumption will not be much affected. This also implies that the consumption of these food declines when its price increases.

Also, from the cross price elasticities, majority of the estimated values had negative sign implying a complementary relationship. The rest of the estimated values had positive sign which implies substitution effect. This support the earlier findings from Oyekale (2000) and Awoyemi *et al.*, (2006)

Table 2: Distribution by Own Price and Cross Price Elasticities

Commodity	Root and tubers	Legumes	Cereals	Vegetables	Fruits	Animal protein
Root and tubers	-0.996	0.240(+ve)	0.303(+ve)	0.108(+ve)	0.086(+ve)	0.023(+ve)
Legumes	-0.0275(-ve)	-0.038	0.087(+ve)	0.001(+ve)	0.0279(+ve)	-0.0255(-ve)
Cereals	-0.0249(-ve)	-0.584(-ve)	-0.446	-0.0715(-ve)	-0.0274(-ve)	-0.088(-ve)
Vegetables	-0.069(-ve)	0.0993(+ve)	0.120(+ve)	-0.0995	-0.128(-ve)	-0.0956(-ve)
Fruits	-0.0127(-ve)	-0.138(-ve)	0.0798(+ve)	-0.065(-ve)	-0.191	0.011(+ve)
Animal protein	-0.0152(-ve)	0.0976(+ve)	0.0631(+ve)	0.0153(+ve)	-0.131(-ve)	-0.577

Source: Field survey, 2009

Note: +ve represents positive; -ve represents negative

Elasticities for Food Consumption

Expenditure elasticities of all the food items are less than one as observed in Table 3. All the food items are expenditure inelastic with root and tubers and fruits having the highest expenditure followed by animal protein, cereals, legumes and vegetables respectively. This implies that despite being staple foods, the consumption of each of these will decline as per capita income increases, this finding is counter intuitive. The highest expenditure elasticity is found for the fruits, suggesting that its demand will grow faster than the demand for the other products as the economy develops and income increases. This is not in line with the earlier findings of Cuma *et al.*, 2007)

The mean budget share is also considered. The highest percentage of budget for food went for cereals (29.8%) followed by animal protein (18%), root and tubers (16.9%), legumes (15.9%), vegetables had 11.3% while fruits had 8.1%. Overall the highest percentage of budget for food went for carbohydrates (root and tubers and cereals), which was 46.7%. This result is in line with the findings of Olurunfemi and Ajibefun (2007)

The estimates of income elasticity are yielded by multiplying the estimated expenditure elasticities with the responsiveness of expenditure on food items by income change from Engel's curve. All the estimates of income elasticities show that root and tubers (0.298) fruits (0.298), animal protein (0.245), cereals (0.224), legumes (0.187) and vegetables (0.140) are normal and necessity goods.

Table 3 : Distribution by Elasticities for Food Consumption

Commodity	Mean budget share %	Expenditure elasticity	Income elasticity
Root and tubers	16.9	0.977	0.298
Legumes	15.9	0.624	0.187
Cereals	29.8	0.78	0.224
Vegetables	11.3	0.469	0.140
Fruits	8.1	0.996	0.298
Animal protein	18.0	0.821	0.245

Source: Field survey, 2009

CONCLUSION

The study conclude that all the estimates of own price elasticities conform to the law of demand with negative signs. Using the estimated coefficients, uncompensated price and expenditure elasticities are evaluated at the sample means. Own-price elasticity for root and tubers is -0.996 and that of vegetables is 0.995, which is relatively more elastic than that for other groups. This result indicates that demand for root and tubers and vegetables are elastic than demands for the other classes of food considered in this study. All the food items are expenditure inelastic with root and tubers and fruits having the highest expenditure followed by animal protein, cereals, legumes and vegetables respectively. This implies that despite being staple foods, the consumption of each of these will decline as per capita income increases, this finding is counter intuitive. The highest expenditure elasticity is found for the

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Journal of Agriculture and Social Research (JASR) Vol. 12, No. 1, 2012

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