

ANALYSIS OF CONSUMPTION EXPENDITURE AND CONSUMER PREFERENCES FOR SELECTED ANIMAL PRODUCTS: THE CASE OF LOW INCOME HOUSEHOLDS IN WARRI, NIGERIA.

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ABSTRACT

Most urban low-income households in Nigeria are plagued with inadequate animal protein intake level. The reasons for this according to literature include such problems as low levels of household income, large household size, low level of education of household head, age of household head, age structure of households, and location of dwelling. This study was aimed at re-examining these issues using data from Warri, a major urban area in southern Nigeria. In addition, the study investigated the hypothesis that in consumer behaviour, a consumer may prefer a commodity X to a commodity Z when the preference ranking is strictly based on desire, while the same consumer would prefer Z to X when the basis for preference ranking is influenced by the ability to purchase. The result showed firstly that the monthly household - income, the household size and the age of household head in that order are the major factors through which variation in the level of household expenditure on animal protein intake by urban low-income household can be explained and predicted.

Income elasticity of household expenditure on fish, chicken, beef and eggs was estimated to be 0.96 which is considered fairly high given the national figure of 0.70. This increase in household monthly income may be a veritable way of stimulating animal protein consumption among low-income urban dwellers. Secondly, it was found out

that as a result of high relative prices and low income level the households actually consume less frequently some of those animal products which they desired more (i.e. preferred).

Keywords: Consumption expenditure consumer preference animal products, low income households in Warri Nigeria.

INTRODUCTION

Animal sources supply the greatest amount of protein, though a lot of people derive their protein largely from vegetable sources (plant protein) which are inadequate (Olayide 1982). Generally the consumption of animal protein is very low in Nigeria. Aromolaran and Atobatele (1988) estimated the per caput par day animal protein intake of urban and rural dwellers in Ibadan area to be 9.56 grams and 2.38 grams respectively. This amount is very small compared with the standard daily per caput animal protein requirement of 35-45grams. A few studies in the past have attempted to identify the factors that could have been responsible for this low level of protein intake in general and animal protein in particular. Aromolaran (1987), estimated a regression equation of per caput protein intake on a number of socio-economic variables for consumers in Ibadan, Nigeria. The result showed that household size and household income were significant determinants of the level

of daily per caput protein intake.

An FAO study in Nigeria in 1960 found that as household become more affluent, they tend to consume more animal protein and less of staple in proportionate amount. Ojo (1983) reported that the proportion of food expenditure on protein food was positively related to income.

Praise *et al* (1971) in analyzing household expenditure pattern held that differences in the consumption pattern of households are as much as possible ascribed to variations in disposable income between households. He however ascribed any differences not explained by income variations to non-economic factors such as the hybrid concept of differences in taste. According to him, a careful examination of family budget statistics shows that one such major cause of differences in taste is the variation in the size and composition of the family. According to Sinha(1976), the consumption pattern of households is affected by several factors which may be economic or non-economic in nature. For example, occupation of members, age and sex distribution, marital status can be significant determinants of consumption pattern in addition to income, taste and size of household.

While some authors found that education exerts a significant influence on household consumption pattern (Ahluwaha 1974), some found that education becomes an insignificant factor, once the family has at least high school education (Davis 1982). Adeyokunmu (1976) found out from a study in western Nigeria that variations in total household expenditure explained the highest proportion of variations in egg expenditure. Total food expenditure was next best followed by total household income of household head and the position of household on the household wealth index.

This study was carried out partly to contribute to the search for knowledge on the various socio-economic factors that may serve as useful policy targets when policies are to be directed towards the improvement of the level of animal protein intake by Nigerian consumers. In addition, most of the studies on animal protein consumption have neglected questions on the preferences of consumers and frequency of consumption for each animal product. The relevant questions here are: What is the order of preference of the consumers among the most common animal products? What animal product is most frequently consumed? And what is the relationship between the consumer preference for and the frequency of consumption of various animal products?

In a study by Aromolaran and Igbaro (1998), it was reported that consumers in Abeokuta in Nigeria preferred chicken, beef and chevron/ mutton in that order of ranking. In contrast, beef was the most frequently consumed of the 3 meat products followed by chicken and mutton/ chevron. Beef was consumed about 8 days /month, chevron/mutton and chicken about 2 days/ month. It was thus concluded that consumers did not consume what they preferred most frequently. The major reason given was high relative price of chicken compared with beef.

MATERIALS AND METHODS

Data Collection

The study was carried out in Warri North and South Local Government Area of Delta State. Delta State is one of the 36 States in Nigeria and is located in the south-western part of Nigeria. The area lies within the tropical rainforest zone.

A survey approach was used for data

collection. 120 low -income households were randomly selected for questionnaire administration (60 from each of the local government areas covered). The sampling was done randomly within this category of households . A household as a decision -making unit in this study is defined as a group of persons who eat from the same pot. It excludes any person who does not live permanently with the family FOS (1966) defined a household unit as people living in the same house/ compound sharing meals in common and running a common budget. The study is a deliberate focus on low income household since these group of households are the most susceptible to protein malnutrition as a result of generally low level intake of animal products. To make sure that low-income households were selected, only low-income residential areas within Warri town fell within the sample population. The households were subsequently chosen randomly. The fact that they are really low income households can be seen from the finding that the total monthly income of the average household was about N4887, which was low at 1995 prices.

Data was collected in 1995. Information collected from only eighty out of the 120 originally sampled households were finally judged suitable for use in the analysis

Methods of Data Analysis.

Techniques of analysis adopted include the paired comparison preference ranking technique (Harper and Eastman, 1980. Aromolaran, 1992) and regression technique. The study covered only 4 animal products namely egg, chicken, beef and fish, which are the most prevalent meat products in the study area. The study specified a consumption expenditure

function.

$C=f(X_1, X_2, X_3, X_4, X_5)$; where

X_1 is household size (no of persons),

X_2 is age of household head (years)

X_3 is average age of the household members (years)

X_4 is level of education of household head (no of years)

X_5 is monthly income of household (N/month)

C is the total expenditure on the four animal products per month in (N)

Three functional forms namely double -log, semi-log and linear, were initially tried on the data collected during the process of estimation of regression coefficients for the specified socio-economic factors.

The paired comparison technique was used as a scientific basis for investigating whether the "effective -demand -based preference ranking" is consistent with the "desire-based preference ranking" of the four animal products by the low-income households . In conceiving this study , an attempt was made to model the usually un-emphasized distinction between "what a consumer prefers in terms of the relative intensity of desirability and what he actually purchases for consumption ." As a result the study attempted to provide an answer to the question: "Is it possible for a consumer to prefer chicken to fish but because he lacks the resources to purchase chicken he actually consumes more of fish than chicken? The desire-based preference is assumed to be the preference situation if all the animal products were to command zero prices. On the other hand the effective -demand or purchase based preference situation is the priority pattern revealed by the frequency of consumption of particular products , which is affected by the particular set of commodity prices

being faced by the households as at the time of the study.

The pair-wise comparison techniques is an element ranking technique in which all elements of the set to which preference/priority ranking is to be made are paired and exhaustively compared by the respondents whose priority ranking are to be determined. A pair-wise comparison (PC) matrix is then set up. Every cell in the matrix presents that total number of "first" that the subject represented on the row scored over the one represented in the column. The PC score which is used to judge preference ranking is simply the sum of all "first" for each element in the row of the matrix. The various scores are then subjected to the LSD (Least Square Difference) to test for statistical significance of the difference between every estimated adjacent PC scores. The LSD, calculated is got by the formula.

$$\text{LSD cal} = \frac{t_a \{ (n) (n + 1) \}^{\frac{1}{2}}}{6}$$

Where B is the number of households,
n is the number of products,
t is the tabulated 't-value', and
a is the level of significance at which the test is carried out.

The difference between two adjacent scores is adjudged significant if it is greater than the calculated LSD.

RESULTS AND DISCUSSION

Description of Household consumption pattern of selected Animal Products

The average household head was found to be 39 years of age, with a minimum of secondary school education, and an average monthly income of N4479 75% of the household heads were salary earners. The average household is made up of 5 persons with a monthly income of N4887

The average household expended N2400 on food montly. The average household expended about N965 of this monthly income on chicken, beef, eggs and fish. All the sampled households used in the analysis had monthly income ranging from N2600 to N9350. Among the household in the study area consumed fish 16.44 days in a month, eggs 6.9 days in a month, beef 7.5 days in a month and chicken 1 day in a month. According to the results of the study, the intake levels of fish, meat (beef/ chicken), and egg had changed considerably in the past five years.

45%, 59% and 44% of the respondent households stated that their consumption of fish, egg and beef/chicken respectively did not change significantly in the past five years, while 55%, 41% and 56% claimed to have experienced significant change in intake. For fish 19% of the latter category of household experienced a significant decrease in intake relative to what it was 5 years earlier, while 36% experienced an increase. Of the 41% that experienced a change in the levels of egg intake, only about 12.5% decreased their intake while 28.75 increased. Finally of the 56% that experienced changes in meat intake (beef/chicken), 40% increased, while 19% decreased.

The major reasons for the observed increases in intake levels relative to what it was 5 years ago were given as:

- * increase in household income (39.3% of households),
- * increased desire for the food (26.8% of households),
- * reduced number of dependants (17.9% of households) and
- * reduced prices of other food items (16.1% of households).

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TABLE 1: REGRESSION RESULTS FOR THE ESTIMATION OF FACTORS THAT DETERMINE THE LEVEL OF EXPENDITURE ON ANIMAL PRODUCTS.

| Functional forms | B ₀ | B ₁ | B ₂ | B ₃ | B ₄ | B ₅ | R ² | Adj R ² | F |
|------------------|-------------------|------------------|-------------------|-------------------|-------------------|-------------------|----------------|--------------------|-----|
| Linear | -128 (-0.70) | 33.4* (2.06) | 7.505* (-1.98) | -5.46 (-0.58) | -0.435 (7.09) | -0.169* (7.09) | 0.79 | 0.77 | 55* |
| Semi-log | -8371* (-7.15) | 111 (1.47) | 360* (2.42) | -54.67 (0.49) | -33.57 (0.76) | 963.3* (7.61) | 0.80 | 0.78 | 57* |
| Double log | -2.4 (-1.99) | 0.244* (3.10) | 0.229 (1.48) | 0.0008 (0.006) | -0.038 (-0.82) | 0.96* (7.24) | 0.81 | 0.80 | 65* |

Source: Field survey, 1995

*represents significance at 5%; and ** represents significance at 10% Figures in parenthesis are t-values

TABLE 2: PAIRED COMPARISON MATRIX FOR CONSUMPTION PREFERENCES OF HOUSEHOLD FOR SELECTED ANIMAL PRODUCTS

| | Fish | Beef | Egg | Chicken | PC Score | Rank |
|---------|------|------|-----|---------|----------|-----------------|
| Fish | - | 64 | 77 | 55 | 196 | 1 st |
| Beef | 16 | - | 67 | 21 | 104 | 3 rd |
| Egg | 3 | 13 | - | 14 | 30 | 4 th |
| Chicken | 25 | 59 | 66 | - | 150 | 2 nd |

Source: Field Survey, 1995

LSD_{Calculated (0.05)} = 17.88

TABLE 3. PAIRED COMPARISON MATRIX FOR CONSUMPTION FREQUENCIES OF HOUSEHOLDS FOR SELECTED ANIMAL PRODUCTS

| | Fish | Beef | Egg | Chicken | Score | Rank |
|---------|------|------|-----|---------|-------|-----------------|
| Fish | - | 75 | 78 | 79 | 232 | 1 st |
| Beef | 5 | - | 57 | 71 | 133 | 2 nd |
| Egg | 2 | 23 | - | 66 | 91 | 3 rd |
| Chicken | 1 | 9 | 14 | - | 24 | 4 th |

Source: Field survey, 1995

LSD_{0.05} = 1.88

The major reasons given for the observed decrease in household intake levels were given as:

- * increase in prices of the products and other food items (56.25%)
- * increased non-food expenditure of household head (23.75% of households).
- * reduced desire for the product (18.75% of households).

Identification of Potential Determinants of Expenditure on Animal Product by Low-Income Households

The analysis in this study went further to statistically identify factors that potentially influences the level of expenditure on these selected animal products. The result of the regression analysis is given in Table 1

The 3 equations estimated showed very good R² of 0.81 , 0.80 and 0.79 respectively for the double log, semi-log and linear functions. The number and types of significant coefficients however vary from one functional form to the other.

For example the linear form showed that 3 variables namely: Household monthly income (X_3), household size (X_1) and the age of household -head (X_2) are statistically significant at 5% level. For the double log form, only household size and income are significant, while for semi log the significant variables are for income and age of household head. According to the results, the older the household -head, the more expenditure on animal products. The explanation may be that older household heads are more likely to have older members and families with older members consume more animal products. Also, the result showed that higher household monthly income resulted in higher animal products intake.

Thus the results show a high consistency with the coefficient of household size and age of household head were less consistent but above average. Each are significant in 2 out of 3 estimated functional forms.

Average age of the household member (X_3) and level of education of household head (X_4) were found to be consistently statistically insignificant.

In summary, the monthly household -income, the household size and the age of household-head were found to be the major factors through which variations in the level of household expenditure on animal protein intake by households in the study area can be explained and predicted. This result is in agreement with the findings by other researchers that the amount an average low income urban household spends on animal products is strongly influenced by household size (Aromolaran and Igharo, 1998) and household income (Adeyokunnu, 1976). It however does not confirm findings that education level of household head is a major determinant of consumer expenditure on animal products.

(Aromolaran and Igharo, 1998, Sinha, 1976).

The income elasticity of expenditure on beef, egg, fish, and chicken is 0.96. That is for every 10% increase in monthly household income, expenditure on the four selected animal products will increase by 9.6% given that prices are kept under check. This figure is a little higher than the 0.70 reported for Nigeria by Anthonio (1966) and far much lower than 1.31 reported for Isi-Ugo LGA of Anambra State, Nigeria (Edeh, 1992). The income elasticity figure obtained for this study is considered fairly high given that the first the national figure of 0.70 and second given the proportion of household income that is presently committed to the purchase of these products which is as high as 19.7%.

Furthermore the estimated elasticity of household expenditure with respect to increase in household size is very low (0.24). The implication of this is that any marginal increase in household size is more likely to reduce the per capital expenditure on animal products by the average household, if income remains constant.

Analysis of Preference Pattern for Animal Products by Low-Income Households

The result of the consumption preference analysis is given in Table 2. The result showed that fish is the most preferred animal protein source in the study area when the priority ranking is based strictly on desire and not actual purchases. The major reasons given for this is its availability and ease of preparation. Chicken is next with a score of 150 followed by beef with a score of 104. Egg is the least preferred of the four products. According to Table 2, 64 of the

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80 respondent preferred fish to beef, 77 preferred fish to egg and 55 preferred fish to chicken. This resulted in a total score of 196 for fish. The LSD calculated at 5% significance level is 17.88. Since the differences between 169 and 150, 150 and 104, 104 and 30 are all greater than 17.88; all the 4 ranking s are significantly different. The preference for chicken by those who preferred it was mainly due to its unique taste. For beef the reason for preference was availability and habit. Eggs are preferred by the few who do primarily because of its nutritional quality.

Table 3 shows the ranking of frequencies of consumption. Fish is again ranked first followed by beef, egg and chicken in that order. The result gives a constant ranking for fish in terms of preference and frequency of consumption. The situation is however different for the other products. For example, chicken is preferred to beef, but beef is consumed more frequently. The main reason given for this is the higher relative price of chicken. They also alluded to the fact that beef was more readily available than chicken. Secondly chicken is preferred to eggs but is consumed less frequently. The major reason is also the lower relative price of egg.

CONCLUSION

This investigation has shown among other things that:

- * Consumers do not necessarily consume more frequently those animal products that they actually prefer more for reasons that are basically economic.

- * Fish was clearly the most preferred as well as the most frequently consumed among the group of low-income households in the study area.

- * In the past 5 years, the intake level of the 4 investigated products has witnessed substantial increase among majority of the households. The major reasons given for these increase were increased level of household income per capita and improved attitude towards the intake of meat products.

- * Household income, household size and age of household head are major determinants of household consumption expenditure on animal products.

- * The income elasticity of expenditure on animal products was found to be fairly high at 0.96, suggesting that income growth policies may succeed in increasing urban low income household intake of animal protein given that prices are kept under control.

- * The estimated elasticity of household expenditure with respect to increases in household size is as low as 0.24, suggesting that any marginal increase in household size is more likely to reduce the per capita expenditure on animal products by the average household, if income remains constant. This has a strong implication for the population control efforts of government in Nigeria.

Thus, any policy aimed at improving the animal protein intake of Nigerians may not succeed if the present problem of low level of per capita real income of the household is not adequately addressed. If the people have more money to spend, they will more likely increase their spending on animal protein.

RECOMMENDATION

Based on the findings of this study. It is recommended that appropriate programme should be directed towards improving per capita real monthly income of low-income urban households in

Nigeria.

One way of doing this, is by improving the employment environment, so that more household members will become income earners thereby reducing the dependency ratio. Secondly population policy should emphasise not too large household sizes among these category of urban dwellers. Thirdly more efforts need to be directed into stabilising the retail prices of animal products since price increase reduces the real income of the households.

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