

## **MODELLING THE HOUSEHOLD DEMAND FOR POULTRY PRODUCTS IN OBAFEMI AWOLOWO UNIVERSITY: A LINEAR APPROXIMATE ALMOST IDEAL DEMAND SYSTEM (LA-AIDS) APPROACH**

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### **ABSTRACT**

The study investigated the demand structure for poultry products in the Obafemi Awolowo University Campus in Nigeria. The study analyzed the budget share allocated to poultry products by households determined the socio-economic characteristics that influenced the size of the budget share, and estimated their income and prices elasticities. Primary data were collected through two-stage sampling procedure. OAU Staff quarters were purposively chosen at the first stage and the second stage involved random selection of staff residing at the quarters.

Descriptive statistics and the Linear Approximate Almost Ideal Demand System (LA-AIDS) were used to analyse the data. The results showed that 53% household's heads are below 50 years of age, 85% of the households had more than 15 years of formal education. 75% are employed in the civil service and 54% of households spend less than 50% of the expenditure on food. The budget share of chicken was significantly and positively affected by prices, those of egg and turkey were significantly affected by their

prices and health status of the household within the community. The elasticity estimates revealed that all poultry products were not own-price elastic while income elasticities for all the poultry products were positive and inelastic but for chicken. The cross price elasticities estimates revealed that turkey was a good substitute for chicken and chicken a good complement for egg.

**Key words:** Poultry, Demand, Elasticities and LA-AIDS model.

### **INTRODUCTION**

Literature has shown that protein is outstandingly important of all the various food components because it provides the body with the basic structural materials needed for growth and repairs and also supplies the vital nutrients that activate the intricate chemical reactions involved in the functioning of the body (FAO, 2003). Apart from the biological function, protein consumption is a pointer to the well being of the economy of a country as corroborated by Food and Agricultural Organization (FAO, 2003).

One major indicator of poverty (which is directly linked with the level of living) is the nutritional status measured by energy and protein intake (Reutlinger and Selowsky, 1976; Srinivason, 1988; Babatunde et al., 2010). Since the energy intake is consistently increasing unlike that of protein (especially animal protein) the level of living could be linked with animal protein consumption. Poultry is one of the cheapest and most available sources of high quality animal protein in Nigeria and other developing countries. The term poultry generally refers to all domesticated birds kept or reared in small or large quantity for egg and meat production. Such birds include chicken, turkey, duck, geese, and guinea fowl. However, chicken is the most common of all the rest in the study area.

Poultry products generally refer to all products derived from poultry birds such as eggs and meat for mainly domestic consumption, poultry droppings used by farmers to improve soil fertility, feathers used for cultural entitlement and industrially to produce feather pillows, beds and foot mats. This study focuses mainly on eggs and meats as poultry products since household demand for poultry products is chiefly in relation to these in terms of food. The demand for protein is due to its direct relationship to food quality. This is corroborated by the Food and Agricultural Organisation of United Nations (FAO, 1995), which estimated a minimum protein requirement of about 70g per caput per day for an adult, and that at least 50% of daily protein requirement should come from animal products of which poultry products belong. Also, poultry products, especially eggs have very high biological value as well as net protein utilization and protein efficiency ratio compared to those of other animal protein sources (FAO, 1949).

Despite the active promotion and direct involvement in the sub-sector, the Nigerian

government was unable to efficiently provide many of the services, which it had undertaken as part of the development initiatives. For instance, the government could not sustain breeding and hatching services, thereby creating a gap between the demand and supply of day-old chicks. Although all the states had their own hatcheries, the hatcheries seldom worked at more than 25% capacity. Due to lack of adequate maintenance culture, many of the incubators soon became moribund. In addition, only about 40-60% of eggs sent to the hatcheries produced live chicks (FAO, 1997).

#### **Statement of Problem**

Per capita food demand in Nigeria is higher than the rate of production (Okuneye 1989, Adejobi, 2004, Babatunde et al. 2009). Invariably, this includes poultry products too. The production and demand for poultry product in Nigeria is affected by several factors such as production cost, selling prices of poultry products, income of the household, etc. These factors determine the gap between the demand for poultry products and their production. This study therefore assessed the effect of the various factors that affect the demand for poultry products in Obafemi Awolowo University (OAU) campus. Also, this study measured the elasticities of poultry products in relation to substitutes and other factors of demand. These were expected to provide quantitative information on the characteristics and the determinants of the demand for poultry products. This was aimed at providing solid footing on which to formulate and implement policies to improve the relationship or gap between demand for poultry products and production of these products.

Furthermore, food consumption and expenditure decisions have long-term effects. Governments' attempts however to reduce the adverse effects of these decisions, affect the food purchasing decisions of household.

Household food decision gives an indication of household food security. They also provide insight into the causes of existing conditions in household food security and help to monitor the welfare effects of macroeconomics policies on the population. This study improved upon existing studies, which estimated food (especially poultry products) demand thus bridging the literature gap. It is intended that the conclusions drawn from this study would help align agricultural development with health and nutritional programmes. This study also gave a comparative information on the poultry products consumption by households in relation to the various factors affecting it.

**The Demand Concept**

According to the theory of consumer behavior, individual or household purchase goods and services to maximize utility (satisfaction) subject to limited income (Koutsoyannis, 1975).

Mathematically, the demand function is expressed as :

$$Q_i = f_i (P_1, P_2, \dots, P_i, \dots, P_n, Y) \tag{1}$$

Where,

- Q<sub>i</sub> = quantity of the i<sup>th</sup> commodity,
- P<sub>i</sub> = price of the i<sup>th</sup> commodity
- Y = household or consumer income

The demand theory suggests an inverse relationship between the quantity demanded of a product and the price of the product (Koutsoyiannis, 1975). This relationship means that an increase in the price of the commodity results in a decrease in the quantity demanded (purchased) with other factors remaining constant. The demand for a product is affected by many factors apart from price, such as income of consumer or household, price of other commodities, which could either be close substitute or complements, taste of consumer, etc. The

relationship between demand for a commodity and the factors that affect that demand (such as price, income, price of other commodities) is known as Elasticity of Demand.

**Elasticity of Demand**

Elasticity of demand is the rate of change (% change) of demand for a commodity in relation to changes in the factors that affect the demand. It describes the relationship that exists between demand and the factors that affect it (Fan et al., 1994). Different types of elasticities exist depending on the factor of demand being considered. Some of the elasticities of demand include the following:

- i. Price elasticity of demand
- ii. Price cross-elasticity of demand
- iii. Income elasticity of demand

**Price Elasticity**

Price elasticity is defined as the ratio of the proportionate change in quantity demanded in response to the proportionate change in price (Fan et al., 1994). Price elasticity is perhaps the most frequently used of the elasticities of demand. It is mathematically expressed thus:

$$E_p = \frac{\text{Relative change in quantity demanded}}{\text{Corresponding relative change in price}}$$

OR

$$E_p = \frac{dq}{q} \div \frac{dp}{p} = \frac{dq}{dp} \times \frac{p}{q} = p \frac{(dq)}{q(dp)} \tag{2}$$

Price elasticity could be greater than 1, less than 1 or even zero depending on the reaction of the demand for the commodity to price change. When the price elasticity of a commodity is greater than 1 (E<sub>p</sub> > 1), the demand for the product is said to be elastic, meaning that the demand for the product will vary considerably above proportion when the price changes. When the price elasticity is less than 1 (E<sub>p</sub> < 1), the demand for the product is said to be inelastic, meaning that a change in

price of the commodity will more or less not affect the demand for that product. When the price elasticity of a commodity is unity ( $E_p = 1$ ), the demand for the product changes with equal proportion to change in price.

Price elasticity of demand depends on both the elasticity of substitution and income elasticity of demand. Thus:

$$E_p = (KX) (E_i) + (1-KX)(E_{ss}) \quad (3)$$

Where,

$E_{ss}$  = elasticity of substitution

$E_i$  = income elasticity

$KX$  = proportion of income spent on X.

All things being equal (*ceteris paribus*) the price of commodity X is inversely related to the quantity demanded, such that the higher the price, the lesser the quantity that will be demanded of X. However, the change in quantity demanded of a product when the price changes depend on the income effect. The income effect in turn depends on partly the proportion of consumer income spent on the commodity.

Given the elasticity of substitution, a decline in the price of X will cause a shift of purchase from X to another commodity only to the extent that other commodity was previously bought. Thus,  $1-KX$  indicates the proportion of income not spent on X and the proportion within which it is possible to substitute X for another commodity.

### **Cross-Elasticity of Demand**

Often, commodities are related in a way that changes in the price of one leads the consumer to change his or her purchases of the other. The cross elasticity of demand measures the extent to which various commodities are related to each other i.e. the strength of substitutability or complementarity (Fan et al. 1994; Adejobi et al. 2009). Where there are

two commodities A and B, the cross elasticity of demand is obtained as the percentage change in quantity of A demanded resulting from a given percentage change in price of B, with the price of A held constant.

Thus;

$$E_c = \frac{\text{Relative change in demand of A}}{\text{Relative change in price of B}} = \frac{\Delta A/A}{\Delta P_b/P_b} \quad (4)$$

The cross elasticity ( $E_c$ ) can be positive, negative or zero, depending on the relationship between the two commodities in question. If  $E_c$  is positive, the commodities are good substitutes, which means that if the price of B rises, there will be large increase in the demand for A. If  $E_c$  is negative, the commodities are considered good complements, meaning that if the price of B should rise; and the quantity of B demanded should reduce, the quantity of A demanded would decrease also. If  $E_c$  is zero, then there is no relationship between the commodities, i.e. a rise or fall in the price of B would cause no change in quantity demanded of A. Commodities with infinite cross-elasticity are considered the same commodity.

### **Income Elasticity**

The level of income of a person has substantial effect on the amount of a given commodity the person will be willing to demand for. The income elasticity ( $E_i$ ) is the responsiveness of a consumer's demand for a commodity to a change in income with price remaining constant (Bishop, 1952). It may be expressed mathematically as;

$$E_i = \frac{\text{Relative change in quantity of commodity purchased}}{\text{Relative change in income}}$$

OR

$$E_i = \frac{dq}{q} \div \frac{dl}{l} = \frac{dq}{dl} \times \frac{l}{q} \quad (5)$$

Income elasticity can be of negative or positive value depending on the type of commodity. All normal goods have positive elasticities, i.e. an increase in income leads to an increase in the amount demanded of the good. Inferior goods have negative income elasticity, meaning that an increase in income leads to a decrease in the quantity demanded of that commodity. Superior goods could be divided into necessity category and luxury category. When  $E_i$  is less than one ( $E_i < 1$ ), the commodity is considered to be of the necessity category. When  $E_i$  is greater than one ( $E_i > 1$ ), the commodity is considered to be of the luxury category.

### Research methodology

#### Study area

The area of study was the Obafemi Awolowo University (OAU) community, Ile-Ife, Osun State, Nigeria. OAU community is located in Ife Central Local Government Area. The University was established in October 1962 to cope with the country's need for post-secondary and higher education. The site comprises about 5,605 hectares of land constituting the central campus, staff quarters, the Teaching and Research Farm, and the OAU Teaching Hospital Complex. The University has 13 Faculties and a Postgraduate College with an approximate population of about 30,000.00. The study was conducted in the staff residence area of the university, where we have the real household set-up as defined by the United Nations (Adejobi, 2004).

#### Sampling Technique and Data Collection

Two-stage sampling procedure was employed. At the first stage, the Staff Quarters area was selected because of the presence of real household setting as defined by the United Nations (2004). At the second stage, a list of staff allocated residence in the senior and junior staff quarters was obtained from the Housing Unit of the University and households were selected at random and were

interviewed with the aid of structured and open-ended questionnaires.

The study made use of primary data. The data for the study was collected with the aid of well-structured questionnaires through interviews, discussions and personal observations on real households. The questionnaires were structured to provide information satisfying the objectives of this study. The study required data covering various aspects of demand such as price of goods, income of household, household demand/ consumption, socioeconomic and demographic data, etc.

#### Analytical technique

Statistical analyses were performed on the data collected. The statistical techniques that were employed include the descriptive statistics and the Linear Approximate Almost Ideal Demand System (LA-AIDS)

#### The Linear Approximate Almost Ideal Demand System (LA-AIDS) Model

This model was used in this study to model household behaviors and to establish the relationship between the demand for poultry products and the various socio-economic variables of households in the study area. The model is expressed below as used by Savadogo and Brandt (1988), Fulponi (1989), Mergos and Donators (1989), Soe et al. (1994) and Adejobi et al. (2009).

$$W_i = a_i + b_i \log(m/p^*) + \sum_j Y_{ij} \log P_j + EV + u_i \quad (6)$$

For  $i, j = 1, \dots, n$

Where,

$W_i$  = Average budget share of items

$a_i$  = Average value of the budget share in the absence of price and income effects.

$b_i$  = Effects on the budget share of item  $i$  of a 1% change in the Real income

$Y_{ij}$  = Effects on the budget share of item  $i$  of 1% change in prices of items in group

M = Total expenditure on the group of items being analyzed

$P_i$  = Weighed average price of items in group j

V = Vector of other independent variables

E = Coefficient of other independent variables

P\* = Price index approximated by stone price index.

$U_i$  = Error term (independently distributed)

The independent variables that describe demand for poultry products are captured as:

AGE = Age of household head

HHSZ = Household Size

EDUC = Level of Education (Years completed in school)

OCCP = Occupation of household head (1 if head is a civil servant; 0 = otherwise)

RFETTE = Ratio of food expenditure to total expenditure of household

DEPRAT = Dependency Ratio

HHINCM = Household monthly income (N)

RPFDEX = Ratio of expenditure on poultry products to total food Expenditure

MEXHELT = Household Monthly Expenditure on Health (N)

ASSETS = Estimated Value of Household Assets (N)

THHEXP = Total Household Expenditure (N)

### **Results and discussion**

Descriptive statistics of socio-economic characteristics and demand of households

The socio-economic characteristics of households such as age, gender, educational status and occupational status of the respondents are discussed in this section. Other socio-economic variables discussed are dependency ration, income and expenditure of households, etc are presented in Table 1.

From Table 1, an average head of household belonged to the middle age category. This is

expected as the fairly old ones had retired from the University service and had vacated the staff quarters. The results further revealed in the same table that an average household head was well read, having more than 15 years formal education and engaged in the civil service.

Table 1 further revealed that majority of the respondents were in the middle income class judging from the ratio of household food expenditure to total household expenditure. Barnett law states that poor households allocate more of their expenditure to food than the non-poor households (Varian, 1996; Adejobi, 2004). Furthermore, there was a very high dependency ratio among the households surveyed in the study area and their allocation to poultry product revealed that majority spent more on poultry products, which might mean higher number of child-dependants. An average household had reduced expenditure on health care services. This might be an indication of healthy living or the effect of the health insurance scheme (NHIS-National Health Insurance Scheme-) being practiced in the University.

### **THE LINEAR APPROXIMATE ALMOST IDEAL DEMAND SYSTEM MODEL ANALYSIS (LA-AIDS)**

**Budget Share of Egg:** From the LA-AIDS Model, it was observed that Adjusted  $R^2 = 0.1$ . This means that just 10% of the budget share allocated to eggs by the household is jointly accounted for by the explanatory variables. It is also observed that the F-value is significant at 5% ( $p < 0.05$ ). This means that the model is of good fit in the analysis. The mean budget share allocated to eggs by household was 0.28 (i.e. 28% of household expenditure on poultry products went to eggs).

Only two variables (monthly expenditure on health and price of eggs purchased) significantly affected the budget share allocated to eggs by household (at 1%

**Table 1: Socio-Economic and Demand Characteristics of Households**

Variable Name	Dominant Indicator	Mean	Standard Deviation
Age	Majority (53%) of household heads are below the age of 50 years	50	6.72
Level of Education of Household Heads	85% of household heads have more than 15 education years of formal	20	5.3
Occupation of household heads	75% of household head are employed in the civil service	-	-
Ratio of food to total household expenditure	54% of households spend less than 50% of their expenditure on food	47	14
Dependency ratio	83% of households have between 0.41 and 0.80 dependency ratio	0.64	0.14
Household monthly income	79% of the households earn more than 100,000.00 per month	187,671	94,498.95
Household Monthly Expenditure on food	76% of households spent more than 20,000.00 on food	20,491.00	11,276.70
Household Monthly Non-food Expenditure	42% of households spent more than 20,000.00 on non food items	22,710.00	19,830.40
Budget share allocated to poultry products	73% of household allocated below 20% of their monthly budget to poultry products	0.158	0.137
Household monthly expenditure on health care services	75% spent less than 2000.00 on healthcare services per month	2,465.19	2,372.97

**Source: field survey, 2008**

probability level). The model showed that expenditure on health is inversely proportional to the budget share allocated to egg by households. This indicates that less consumption or demand for eggs reduces increases the proportion of household income spent on healthcare services.

The price of eggs purchased is directly proportional to the budget share of household

income allocated to eggs as indicated by the model. This means that as prices of eggs purchased increased, the budget share of eggs increased too. This is because the respondents being elites, know the biological value of eggs. Thus they retain their level of egg consumption and demand even as the prices of eggs increased. These resulted in the increases in the budget share of eggs by households as the prices of eggs increased.

### **Budget Share of Chicken**

From the LA-AIDS estimates, the adjusted  $R^2 = 0.5$ , meaning that 50% of the budget share allocated to chicken by households is jointly explained by the explanatory variables. Also, the F-value is significant at 1% probability ( $p < 0.01$ ). This means that the model has a good fit for the analysis. The mean budget share of chicken was 0.413, suggesting that 41.3% of the household expenditure on poultry products was on chicken.

Only the price of chicken purchased is significant at 5% ( $p < 0.05$ ). From the model, budget share allocated to chicken by households was directly proportional to price of chicken consumed. This is because the households, having maintained their level of demand for chicken due to prior knowledge of the biological value, increased their budget shares allocated to chicken as the prices increased, all other factors held constant.

### **Budget Share of Turkey**

From the LA-AIDS model, the adjusted  $R^2 = 0.1$ . This means that 10% of the budget share allocated to turkey by households is jointly accounted for by the explanatory variables. Also, the F-value is significant at 5% ( $p < 0.05$ ), meaning that the model is of good fit in the analysis. The mean budget share of turkey by household is 0.307, suggesting that about 31% of the expenditure on poultry products is spent on Turkey.

The coefficients of only two explanatory variables, used in the analysis (expenditure on health and price of eggs purchased) were significant, and both of them at 1% ( $P < 0.01$ ). Expenditure on health is inversely

proportional to budget share of turkey. This shows that increase in the demand for Turkey by households might improve the health status of the household and as such might cause household to reduce expenditure on health.

Price of egg purchased is directly proportional to budget share of turkey by household. This perhaps indicates that turkey is a close substitute of egg. Thus, as the price of egg purchased increases, more of the household budget meant for egg is shifted to that of turkey.

### **Elasticities of Egg, Chicken and Turkey**

From the LA-AIDS model, three types of elasticities were computed for the different poultry products using the formulae below

$$\text{Own-price elasticity} = 1 + \left( \frac{Y_{ii}}{W_i} \right) + b_i$$

$$\text{Income elasticity} = 1 + \frac{b_i}{W_i}$$

$$\text{Cross-price elasticity} = \left( \frac{Y_{ij}}{W_i} \right) - (b_i * W_j) / W_i$$

Where

$Y_{ii}$  = Coefficient of  $i$ th commodity price

$b_i$  = Coefficient of stone price index

$Y_{ij}$  = Coefficient of  $j$ th commodity price

$*w_j$  = Absolute mean budget share of  $j$ th commodity.

Own price elasticity measures the degree of responsiveness of the budget share allocated to the various poultry products as their respective prices change.

**Table 2: LA-AIDS MODEL ANALYSIS**

Variable	EGG		CHICKEN		TURKEY	
	Coefficien t	t-value	Coefficien t	t-value	Coefficien t	t-value
Constant	2.651	1.421	-8.650	-2.186	2.220	1.412
Age	-2.990	-1.355	8.710	1.758	-2.970	-1.346
Household size	1.128	0.131	8.460	1.470	1.161	0.134
Education level	-3.770	-0.795	-2.101	-0.222	-3.762	-0.775
HHINCM	-0.027	-0.155	0.061	1.579	-0.027	-0.155
ASSETS	0.027	0.002	-8.766	-1.529	-0.195	-0.002
MEXHELT	-0.156	- 2.875***	0.037	-0.298	-0.156	-2.875***
PREGPU	0.048	2.678***	0.069	-1.691	0.048	2.673***
PRECHIKPU	0.051	0.621	0.051	2.472**	0.052	0.629
PRTUKPU	0.015	-0.001	-0.056	-0.244	0.013	0.013
Adjusted R <sup>2</sup>	0.1		0.5		0.1	
F-value	2.33**		10.58***		2.23**	

**Source: Computed from Results of AIDS Model, 2008**

\* = Significant at 10%

\*\* = Significant at 5%

\*\*\* = Significant at 1%

From Table 3, all the poultry food components were price inelastic with respect to the budget share allocated to them. It is also observed that egg is the most inelastic of the poultry products. The negative signs on the elasticity coefficients indicate that there is however, a tendency for the budget share to decrease rather than increase as the price of the products rise. Thus, the price elasticities of the

poultry products implies that price increase of these poultry products (egg, chicken and turkey) results to less than proportionate decrease in the budget share allocated to them. Income elasticity measures the degree of responsiveness of the budget share allocated to the various poultry products with respect to change in income.

**Table 3: Own Price Elasticity**

<b>Food Class</b>	<b>Own Price Elasticity</b>
Chicken	-0.93
Egg	-0.71
Turkey	-0.99

**Source: Computed from the results of AIDS Model, 2008**

**Table 4: Income Elasticity**

<b>Poultry Products</b>	<b>Price Elasticity</b>
Chicken	1.003
Egg	0.999
Turkey	0.999

**Source: Computed from the results of AIDS Model, 2008**

From Table 4, it can be deduced that the income elasticity of all the poultry products are positive, meaning that they are all superior goods to the household. However, it is observed that chicken is a luxury good and income elastic such that increase in income would result into more than proportionate increase in the budget share allocated to chicken by the household. Thus, it could be deduced that households consume chicken as a show of their wealth.

For egg and turkey, the income elasticities are inelastic and thus necessary household goods. This implies that as income increases, budget

share allocated to egg and turkey increases less proportionately to the increase in income. This conforms to the a prior expectation that the quantity demanded of necessity goods are relatively constant irrespective of increase or decrease in income of household.

Price-cross elasticities is the degree of responsiveness of the share of food budget allocated to a particular poultry product with respect to changes in the prices of other food subgroups (other poultry products). Thus this measures the degree of complementarily or substitutability of the different poultry products. The signs of the co-efficient, if

positive indicate substitutability, and if negative indicates complementarity. From Table 5, the price cross elasticity of turkey/chicken, turkey/egg, and chicken/egg are positive, indicating substitutability of turkey to chicken, turkey to egg, and chicken to egg. This implies that a rise in the price of chicken and egg would cause increase in the budget share allocated to turkey. Rise in price

of egg would cause increase in the budget share allocated to chicken. The price-cross elasticity of chicken/turkey, egg/turkey, and egg/chicken are negative, indicating complementarity. This means that a rise in the price of turkey would cause a decrease in the budget share of chicken. A rise in the price of turkey and chicken would also cause a decrease in the budget share allocated to egg.

**Table 5: Price Cross - Elasticity**

Poultry Products	Price Cross – Elasticity
Turkey/ Chicken	0.25
Turkey/ Egg	0.24
Chicken/Egg	0.017
Chicken/Turkey	-0.0044
Egg/Turkey	-0.048
Egg/Chicken	-0.3

**Source: Computed from the results of AIDS Model, 2008.**

## 5.0 CONCLUSION AND RECOMMENDATIONS

This study examined the demand for poultry products by households in Obafemi Awolowo University Campus. The study covered the residential staff quarters of the University. In the course of the study, 100 households were selected at random, majority of whose heads were married and very few separated. The average age of respondent is 50 years with an average household size of 5 members. About 85% of the respondents were well educated up to graduate and post-graduate level. Most of the respondents were lecturers and teachers (about 75%). The dependency ratio of the households were high (averagely 64%), perhaps due to the longer number of years spent in schooling by the household members. The average monthly income of the

households was N187, 670 (\$1251.13), while their average total expenditure was N42, 700 (\$284.67) monthly. It is also observed that the ratio of food expenditure to total expenditure was 0.5 with an average food expenditure of N20, 500 (\$136.67) per month.

The average ratio of poultry food expenditure to total food expenditure was 0.16, with the average budget share of the different poultry components being 0.28 for Eggs, 0.413 for Chicken, and 0.307 for Turkey. The average overall budget share allocated to poultry products relative to total food budget of the households was 0.158.

From the study, price of eggs purchased was a significant factor which positively influenced budget share allocated to eggs by the

household. The proportional relationship between the price of eggs purchased and the budget share allocated to egg showed that egg was a necessary household good in the community. This was further corroborated by the income elasticity of egg which was positive and less than 1. It also implied that the demand for egg was high. Also the inverse relationship between the budget share of egg and the household health expenditure implied that households should increase their consumption of eggs to enhance their nutrition for better family health and thereby reducing expenditure on health.

Also, the, price of Chicken purchased was a significant factor which positively influenced the budget share allocated to chicken. The budget share increased as price of chicken increased. This was further corroborated by the income elasticity of chicken which was positive and greater than 1, indicating that it is a luxury good, and thus consumed even at high price to boast the household wealth status.

From the results, it was observed that the coefficient of the expenditure on health was significant and negatively affected the budget share allocated to turkey. This implied that turkey, due to its high biological value, boosts the household health status, thereby reducing their expenditure on health as demand for turkey by household increases. Also it was observed that the price of eggs significantly and positively affected budget share allocated to turkey, such that the higher the price of egg, the higher the budget share allocated to turkey, implying that turkey and egg may be substitutes. This was further corroborated by the price cross-elasticity of turkey to egg which was positive and high. It was observed from the cross-elasticities in Table 4, that turkey was a good substitute for chicken too, while chicken was a poor substitute for egg. However, chicken was observed to be a good complement of egg.

## **5.1 RECOMMENDATIONS**

From the results of this study, it is recommended that there should be nutritional policies targeted at stimulating the household demand for Egg and Turkey, while putting into consideration the significant effect of increase in the prices of eggs on household demand for Turkey. Moreso that they have been confirmed to be close substitutes by the price cross elasticity of Turkey for Eggs. These policies should focus at reducing the cost of Eggs by expanding production and marketing of Eggs and at the same time increasing the production of Turkey as a close substitute to Chicken. The present production level of Chicken should be maintained for the benefit of the higher income earners and also for the fact that the price elasticity of Chicken for the household is inelastic.

Further more, since the variable for expenditure on healthcare services by households affected the budget share allocated to various poultry products, there is need for the development of dietary guide for the consumption of these products as this will reduce health risks with their attendant increases in costs associated with health care services.

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