Vol. 1 No.1, July 2021

FUAM Journal of Pure and Applied Science

Available online at
www.fuamjpas.org.ng

An official Publication of
College of Science
Joseph Sarwuan Tarka University,
Makurdi.

FUAM Journal of Pure and Applied Science
© College of Science, Joseph Sarwuan Tarka University, Makurdi
https://fuamjpas.org.ng/
Vol.1. No. 1. July, 2021

Consumer Demand for Broiler Chicken: A Panacea for Meat Needs in Hidden Hunger Situations in Kaduna Metropolis of Kaduna State, Nigeria.

S.I. Ogbonna
Department of Agricultural Economics and Extension, Faculty of Agricultural Sciences,
National Open University of Nigeria Abuja, Kaduna Campus, Kaduna State.
Correspondence E-mail: sogbonna@noun.edu.ng

Received: 19/04/2021 **Accepted**: 17/07/2021 **Published online**: 24/07/2021

Abstract
The objective of this study was to analyze consumer demand for broiler chicken meat as solution for meat needs in solving nutrition problem associated with hidden hunger in Kaduna metropolis of Kaduna State, Nigeria. Primary data was gathered with structured questionnaire from thirty (30) Broiler Chicken consumers and subjected to descriptive and inferential analysis using Ordinary least Square (OLS) multiple regression tool. The findings showed responsive broiler chicken meat consumption across income categories positively increasing with their monthly expenditure on chicken broiler meat for reasons ranging from palatability to availability. The own price elasticity of broiler was perfectly inelastic while the income elasticity of demand for broiler meat was elastic. The value of cross price elasticity of demand for broiler meat with frozen fish indicated a strong degree of competitiveness and substitutability. It is the recommendation of this study that Kaduna State government should implement policies and programs geared towards reducing the cost of broiler meat for consumers living in Kaduna metropolis to stimulate consumption of broiler meat (white meat)as to enjoy food nutrient security and banish hidden hunger in the state.

Keywords: Hidden hunger, Consumer demand, Broiler Chicken, Meat.

Introduction

The traditional meat in Nigerian markets over the years has been beef. In recent times, many Nigerians are complying with international health calls [10]to reduce consumption of red meats and dairy products and substitute them with white meat, fruits and vegetables. This seems to have altered demand for meat including Chicken broiler by households in urban markets of developing countries [11]. Most consumer goods have their demands influenced by their unit prices, consumer tastes and preference-related factors.

These preference-related factors are most times nutrition-based as one's health depends much on what he/she eats.

Many consumers suffer from malnutrition especially in terms of deficiencies of vitamins and minerals. This is called hidden hunger. Food micro nutrients are very important in controlling

metabolic balances. Apparently, consuming households in urban areas have the money to buy their food needs, yet nutritionally they may be suffering from hidden hunger. Hidden hunger does not show as hunger but chronically manifests as iron, zinc, iodine and vitamin A deficiency. Chicken meat (broilers) provides vitamins mainly the B complex, including the niacin or vitamin B_3 essential for metabolism of fats and sugars and maintenance of healthy cells. It also provides Magnesium, Potassium, Phosphorous, selenium and zinc. The cholesterol content is low with the exception of the easily removable skin.

The expenditure elasticity for chicken meat alongside other meat substitutes was greater than unity, suggesting that chicken meat is a luxury food for many households [8]. This study therefore was designed to: (i) analyze consumer demand for broiler chicken by households in Kaduna metropolis of Kaduna State, Nigeria; (ii) determine tastes and preference-related factors influencing demand for broiler chicken in the study area; and (iii) analyze elasticity measures in the demand for broiler chicken in the study area.

Materials and Methods

The study was carried out in Kaduna Metropolis, the Kaduna state administrative capital in Nigeria. Kaduna metropolis is the economic and financial center located between Longitudes 07^0 19' and 07^0 31' East occupies an area of about 260km^{2}and between Latitudes 10^0 28' and 10^0 37' North of the Equator. Kaduna Metropolis is made up of two main local government areas, the Kaduna North and the Kaduna South, other adjoining local government areas are Igabi and Chikun. The total population that made up the metropolis has the largest concentration at Kaduna North, (677,714) followed by Kaduna South (584,105) [7].

This study applied stratified random sampling method in selecting broiler chicken meat consumers in Kaduna metropolis. Three long standing broiler chicken traders in Abubakar Mahmud Gumi market were involved. They guided the selection of consumers on basis of income categories (high, medium and low income) they perceived of the broiler consumer. Data collected were subjected to descriptive analyses of mean, frequency tables, percentages and multiple regression analysis.

The implicit model of the determinants of demand for broiler by the consumers was formulated as follows:

$$Q = F(X_1, X_2, X_3, X_4, X_5, e_i) \quad (1)$$

Where

Q = Monthly weight of broiler chicken consumed (kg);

X_1 = Distance of consumer to broiler market (Km);

X_2 = Household size(number);

X_3 = unit Price of matured broiler (₦);

X_4 = monthly expenditure on broiler meat (₦);

X_5 = Level of education (years);

X_6 = Price of substitute (fresh fish) (₦)

X_7 = Availability of processing services (Yes = 1; No = 0)

Four functional forms (linear, exponential, double-logarithmic and semi-logarithmic forms) were fitted with the data. The lead equation was selected based on statistical and econometric criteria such as number of significant variables exposed, magnitude of F-ratio and coefficient of multiple determinations (R^2) and the conformity of the coefficients to *a priori* expectations.

In estimating response of consumers to broiler and fresh fish as cross products, the following variables were considered:
Q = Quantity of broiler demanded; P = Unit Price of commodity (broiler); and the cross-price elasticity of demand were estimated using:

$$EXY = \frac{\delta Qx}{\delta Py} \cdot \frac{Py}{Qx} \quad (2)$$

Where
EXY= Cross elasticity of commodity X (broiler) with regard to commodity Y(frozen fish);
Qx = Quantity demanded of commodity X (broiler);

Py = Price of commodity Y (frozen fish).
The income elasticity was specified as

$$\frac{\delta Q}{\delta Y} \cdot \frac{Y}{Q} \quad (3)$$

WhereQ = Quantity of the broiler meat demanded (kg);Y = Consumer's income (estimated with monthly expenditure in Naira).

Results and Discussion

Socio-economic Characteristics of Broiler Chicken Consumers

Table 1.0 shows the distribution of attributes associated with consumers of Broiler Chicken in Kaduna Metropolis. The findings showed that 50.0% of the broiler chicken meat consumers were within the ages of 41 and 50years, 13.3% of the consumers were within the age range of 60 years and above. The mean age of broiler meat consumers was 45 years. In terms of gender, 56.7 % of broiler meat consumers were females while 43.3% of them were males. The Table also showed that 66.7% of broiler meat consumers were married, while 13.3% of them were single. This suggests that married consumers demanded more broilers for meat to meet the needs of their larger household size and for the protein requirement of their growing children. The table 1 showed that 56.7% of broiler meat consumers had secondary school education. It is evident that 20.0% of broiler consumers had tertiary education. This result aligned with [2]and [8]who believed that educational level affects food consumption patterns. Table 1.0 also showed that 43.3% of the broiler meat consumers had household size of between 5 and 9 persons while 23.3% of the consumers had household size of above 9 persons. The mean household size of the consumers was5persons. The findings revealed that 46.6% of broiler meat consumers earned annual income of between ₦150, 000.00 and ₦200, 000.00. The mean annual income of broiler consumers was₦112, 290. This finding aligned with (8) who believed that income determines the quantity of broiler meat consumption.

Table 1: Socio-economic Characteristics of Broiler Chicken Consumers

Socio economic characteristics	Category	Frequency	Percentage
Age of Chicken Broiler Consumers	30 – 40	6	20.0
	41 – 50	15	50.0
	51 – 60	5	16.7
	Above 60	4	13.3
	Total	**30**	**100.0**
	Mean = 45.03	**SD = 2.0882**	
Gender	Male	13	43.3
	Female	17	56.7
	Total	**30**	**100.0**
Marital Status	Single	4	13.3
	Married	20	66.7
	Widowed	5	16.7
	Divorced	1	3.3
Educational Status	No formal education	2	6.7
	Primary education	5	16.7
	Secondary education	17	56.7
	Tertiary education	6	20.0
House hold size	1 – 4	13	33.3
	5 – 9	7	43.3
	Above 9	10	23.4
	Total	**30**	**100.0**
	Mean house hold size is 5		
			6.7
Income level	1 – 50,000	2	3.3
	50,000 – 100,000	1	10.0
	100,000 – 150,000	3	46.6
	150,000 – 200,000	14	16.7
	200,000 – 250,000	5	16.7
	250,000 – 3000,000	5	

Total	**30**	**100.0**

Monthly Per Capita Broiler Chicken Meat Demanded by Kaduna Metropolitan Consumers

Table 2.0 shows the monthly broiler meat demanded by metropolitan consumers according to income group. The findings showed that within the households 2.1 kg, 1.3kg, and 0.9kg of broiler meat was demanded on average weekly by high income group, medium income group and low-income group respectively in favour of each member of their household. The minimum daily protein requirement could only be met by the high-income group leaving persons in medium and low-income group with hidden hunger not only in terms of protein needs but minerals and vitamins.

The three income categories patronized the chicken broiler traders within the Kaduna metropolis and were investigated. [5] Classified Nigerian Middle Class" as persons that earn ₦75,

000.00--₦100, 000.00 (US$480-US$645 monthly). This formed the basis of getting the low income below them and the high income as people that earned higher than them as used by [4] and applied in Table 2.0.

Table 2: Mean Monthly Per Capita Chicken Broiler Meat Demanded by Income Groups in Kaduna Metropolis

S/N	Monthly Income Group* (n=30)	Mean weekly Broiler Per capita Demand (Kg)	Remarks
1.	High income Group >₦100,000.00	2.1	WHO recommended 44.4g of protein per person per day
2.	Medium income Group ₦75,000.00 – ₦100,000.00	1.3	ditto
3.	Low-income Group <₦75,000.00	0.9	ditto

*Based on Femi Adewunmi's 2011Classification in "Renaissance Capital Survey on booming Nigerian Middle Class" ₦75,000.00--₦100,000.00 (US$480-US$645 monthly);[ф]=WHO, 2003

Hidden Hunger Factors that Influenced Consumers Expenditure on Broiler meat

Estimates of factors that influenced consumers' demand for broiler in Kaduna metropolis is shown as Table 3.0.The Table showed that all the functional forms tried (linear, exponential, double logarithmic and Semi-logarithmic) fitted the data well and were significant ($P < 0.01$). This implies that any of the functional forms was adequate in explaining the variations in monthly expenditure on chicken broiler meat. However, the demand equation was best estimated and explained using the linear functional form which explained 64.67% of the total variation in explanatory variables in the model. Furthermore, other statistical and econometric considerations such as the number of significant coefficients of variables and their conformity to *a priori* expectations were in favour of linear functional form which served as the lead equation.

The coefficient (-0.229) of price was inversely related to consumers' monthly expenditures on broiler meat and was significant at 10.0% probability level. An increase in the price of broiler meat led to a decrease in consumers' monthly expenditure on broiler meat and the quantity. The coefficient of household size (0.075) was positive and significant at 1.0% risk level, strongly suggesting that an increase in household size led to an increase in monthly expenditure on

broiler meat. This result was at variance with *a priori* expectation. This shows that the level of meat consumption was not dependent on household size but of the level of income and choice of the consumers. This is in contrast with [10] that consumption rate is a function of family size. Expectedly, consumers with large household size are less likely to spend more on broiler meat, but will rather spend on frozen fish that was relatively cheap and served as the main source of daily per capita consumption of animal protein. The coefficient of income was positive (21.75) and significant at 5.0% alpha level. This implies that as the income of consumers' increased, the monthly expenditure on broiler and quantity consumed increased. The coefficient (0.088) of education was positive and statistically significant at 5.0% risk level. An educated consumer was likely to be rational in decision making and responsive to the protein needs of the family [2]

Table 3: Ordinary least Square (OLS) Estimates of Hidden Hunger Factors that Influenced Consumers Expenditure on Broiler Chicken meat in Kaduna.

Variable	Linear +	Experience	Double Log.	Semi Log.
Constant	3.609* (1.77)	1.438*** (4.95)	-1.075 (-0.74)	-12.32 (-1.18)
Education(X_1)	0.088** (2.45)	0.013** (2.43)	0.487** (2.25)	3.1189** (2.06)
Income (X_2)	21.75** (2.06)	1.94e-06 (0.74)	0.026 (0.28)	0.037 (0.06)
Marital Status (X_3)	-0.062 (-0.88)	-0.008 (-0.78)	-0.043 (-0.50)	-0.316 (-0.52)
Distance to market(X_4)	0.546 (0.81)	0.039 (0.41)	0.045 (0.46)	0.567 (0.82)
Price of Meat (X_5)	-0.229* (-1.81)	8.27e-06*** (2.54)	0.155* (1.96)	1.226*** (2.17)
Household (X_6)	0.075*** (3.30)	-0.037** (-2.04)	-0.255** (-2.42)	1.835** (2.45)
Processing service(X_7)	0.427 (0.59)	0.032 (0.30)	0.025 (0.23)	0.362 (0.48)
Price of substitute(X_6)	0.189 (1.38)	0.036 (1.45)	0.740 (1.34)	1.317 (1.40)
R^2	0.6467	0.41	0.199	0.396
Adjusted R^2	0.6159	0.456	0.123	0.330
F- ratio	5.64***	2.80***	2.62***	2.73***

***, **, * = Significant at 1.0%, 5.0% and 10.0% alpha level respectively; Figures in parenthesis are the t- ratios + = Lead equation

Price, Income and Cross Elasticity of broiler demand by the Consumers

Table 3 showed that the income elasticity of demand for broiler meat was 0.3. This implies that as consumers' income increase, a portion of their income will be spent on the product. This result is consistent with [3] result in the consumption of pork. However, a change in consumer's money income will have a significant influence on consumption of the product either increasing or decreasing consumption.

Table 4.0 showed the evaluation of the variation in prices of broiler on consumption expenditures. The analysis of the coefficient of price income and

cross elasticity of demand for broiler meat consumers showed that the own price elasticity of broiler meat was 0.06. This indicates that a percentage change in the price of broiler meat would result in a less than proportionate change in the quantity demanded of it, hence being perfectly inelastic. This result compared favorably with [3] that obtained -0.83 as own price elasticity in pork demand in Cross River State of Nigeria.

The value of cross price elasticity of demand for broiler meat with fish was 2.3. This implies that a one percent increase in the price of broiler meat will increase the consumption of frozen fish by 2.3% in Kaduna metropolis. This indicates a strong degree of competitiveness and substitutability of broiler meat with frozen fish. As the elasticity coefficient is positive, it infers that the two commodities (broiler and frozen fish) are substitute, while a negative coefficient means that the goods are complementary good.

Table 4: Estimate of Own Price, Cross Price and Income Elasticity of Demand for Broiler Meat in Kaduna Metropolis of Kaduna State, Nigeria.

Elasticity	Coefficient
Own price elasticity	0.06
Income elasticity	0.32
Cross elasticity	2.30

Conclusion

Based on empirical estimates from both descriptive and inferential analyses done on this study, the following conclusions were made:

(i) The consumers' monthly demand of broiler chicken meat was influenced by household size, annual income, unit price and level of education of the consumers;

(ii) The own price elasticity of demand of broiler was perfectly inelastic with the income elasticity of demand for broiler meat being elastic.

(iii) The value of cross price elasticity of demand for broiler meat with frozen fish indicated a strong degree of competitiveness and substitutability of fish with broiler meat.

It is the recommendation of this study that Kaduna State government should implement policies and programs geared towards reducing the cost of broiler meat for consumers living in Kaduna metropolis to stimulate consumption of broiler meat (white meat)as to enjoy food nutrient security and banish hidden hunger in the state. This will enable the attainment of the daily protein intake recommended by [6] and [13] and achieve household food security.

References

[1] Adewunmi, O. 2011. **Nigeria's Middle Class**: How we live, and what we want from Life. How We made it in Africa. Insight into Business in Africa, DHL.

[2] Anyiro C.O., Ezeh, C.I..Osondu, C.K and. Madu, L.K ,2013. **Meat Consumption Patterns Among Different Income Groups in Imo State,** Nigeria. *Journal of Agriculture, Forestry and the Social Sciences*. 11(1):21-31.

[3] Effiong, E.O., 2004, **Pork Consumer Behaviour in Cross River State, Nigeria; An Emperical Evidence**. *Journal of Agriculture and Food Science*. 2(1): 43-47

[4] Emerole, C.O. ,Ezeh, C.I. and Okorie, O. 2018. **Trade-Off in Consumption of Imported and Traditional Own Foods Amongst Igbo Farm Households In Nigeria**. *Journal" Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*", 18(1): 161-172

[5] Femi A., 2011, **How the Economist changed its tune on Africa. *How we made it in Africa*** *is published by Maritz Publishing CC South African Company registration 1986/016772/23*

[6] Food and Agriculture Organization (FAO) 2010. **Chicken genetic resources used in smallholder production and opportunities for their development. Poul Sørensen** Department of Biotechnology and Genetics, Faculty of Agricultural Sciences, University of Århus, Denmark

[7] National Population Commission (NPC),2006. **Population and Housing Census,** 2006. National Population Commission, Abuja, Nigeria.

[8] Ogbonna, S. I. 2018.**Analysis of food security status of small holder** farm households in Oru East LGA of Imo State, Nigeria. "*International Journal of Agriculture and Rural development (IJARD)" Vol. 21(2):3794-3800,* 2018

[9] Osho, G. S. and Nazemzadeh, A. 2005. **Consumerism: Statistical Estimation of Nigeria Meat Demand. Journal of International Business Research** 4 (1), 69.

[10] Onyeneke, R.U. and Nwaiwu, J. 2012. **Micro level analysis of beef and fish consumption in Imo State, Nigeria** .*Agricultural Research and Reviews*, 1(1): 1–8.

[11] Pollack S L., 2006. **Consumer Demand for Fruits and Vegetables: The U S Example**. Economic Research Service USDA. Changing Structure of Global Food Consumption and Trade WRS -01-1.

[12] Tambi, E. N. 2001. **Analysis of Household attitude towards the purchase of livestock Products and fish in Cameroon.** *The Journal of the International Association of Agric. Economics. Elsevier* ***26*** *(2) 135-147.*

[13] World Health Organization (WHO) 2003. **Diet, nutrition and the prevention of chronic disease. Report of the FAO/WHO Expert Consultation**: WHO Technical Report Series, No.919. Geneva

Cite this article

Ogbonna S.I. (2021). Consumer Demand for Broiler Chicken: A Panacea for Meat Needs in Hidden Hunger Situations in Kaduna Metropolis of Kaduna State, Nigeria. *FUAM Journal of Pure and Applied Science*, **1**(1): 7-13