PATTERN AND DETERMINANTS OF CONSUMERS DEMAND FOR CANNED FOOD IN ILORIN METROPOLIS OF KWARA STATE, NIGERIA

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ABSTRACT

The research work focused on the demand for canned food in Ilorin metropolis of Kwara state. Random sample selection of 120 respondents was made in four supermarkets in Ilorin namely Shoprite Supermarkets, Matrite Supermarket, B-system Supermarket and Gomola Supermarket. The data gathered were analysed with the use of The Almost Ideal Demand System (AIDS) Model. Estimates of AIDS revealed that the budget shares of different classes of canned food for the sampled households had a significant relationship with the household size, marital status, household's head education and the price of the various classes of canned food. The estimated own-price elasticity coefficients were negative, indicating that as the price of each food group increases, the relative share of household expenditure decreases accordingly. The Cross-price elasticity coefficients for some food groups were negative indicating they are "complementary'' while others have positive coefficients suggesting that they are "substitutes''. Based on these findings, the recommendation, therefore, is to reduce the cost of canned food by the producers to encourage consumers to buy more of canned food, while advertisement and publicity are also improved.

Keywords: demand, food, canned, consumer, Nigeria

1.0 INTRODUCTION

Times were when food products were only available in fresh and unprocessed form. Over time, however, and with the advancement in science and technology, food products have become available both in the unprocessed form as well as processed forms. This development arose from many competing factors including food preservation, food security, transportation, marketing, and globalisation among others. Each of the two broad classes of food products presents different appeals to different people for different reasons. Thus, the range and variety of the food product in the retail market today provide a challenge for understanding consumers' purchase decision making and consumption pattern.

Consumers use different physical and mental methods to infer food quality [1]. These vary from assessing the fat content and appearance of the food item to examining the price, labels and packaging of the food items. Thus, in order to meet consumers' expectation and preferences, it is important for the producer to know which quality cues and quality are relevant and accessible to the consumer. Moreover, from a consumers' perspective, some food qualities have to be easily understandable to reduce uncertainty about the product and encourage consumption [2, 3]. Thus, methods aimed at promoting food quality and differentiate food items need to be effectively communiated to the consumers [4].

Canning of food is a method of preserving food in which the food contents are processed and sealed in an airtight container. Examples of food that can be stored by canning include; fruits, vegetables, meat, milk, fish or a combination of these foods (e.g. meat and vegetable, condensed soup, sauce, and fruit salad). Canned foods generally have long shelf lives. Food manufacturers generally recommend that canned food be stored in a cool, dry place, not near a furnace, pipes, stoves or in direct sunlight.

Though tastes of consumers as regards food are highly varying, there is hardly any difference in the qualities that they value. Topping the list of consumer demands for foods and packaging are freshness, ingredients of superior quality, convenience and eco-friendliness. The humble can can provide all of these, though consumer perception regarding the same is very low. For instance, the convenience offered by canned foods is highly valued by consumers, but other benefits, such as health and nutritional advantages are often ignored. Today's consumer is gaining an insight into the role played by nutritious foods to maintain a healthy lifestyle, with health-conscious diets becoming more common and driving the demand

for the most nutritious food on offer. Diet plays an important role in health and disease. The food we choose to eat can help in the prevention of many illnesses, thus increasing our quality of life. In local supermarket, there are more food choices than ever before. This can lead to confusion in determining what food choices are the healthiest.

1.1 Problem Statement

The demand for products of processed foods by consumers in Nigeria is said to be in the increase and estimated to be more than 500 billion per annum. The low purchasing power of the average Nigerian consumer, however, points to the fact that fortunes of the Food Industry are highly dependent on the affordability of product- prices. Global efforts are geared towards enhancement of food production, distribution and marketing, thus making processed food highly favoured. It is, therefore, necessary to develop a better understanding of consumer demand for canned food. There are limited or no studies that have analysed the consumer demand for canned food in Ilorin. This is the research gap that this study hopes to fill by providing answers to the following questions:

1. What is the consumers' consumption pattern for canned food?
2. What are the factors influencing the demand for canned food in the study area?
3. What are the price and income elasticity for canned food in the study area?

2.0 RESEARCH METHODOLOGY

This section explains the study area, sampling techniques, materials and methods used for this study. It shows the model specification used in proffering answers to the research questions.

2.1 The Study Area

The study was conducted in Ilorin, the capital of Kwara state, Nigeria. Ilorin has a population of 847,000 [5]. It lies in the plain of the southwestern part of Nigeria. Kwara state as a whole has a population of 2.4million people. Ilorin city lies along Lagos –Kaduna highway, and it is about 306km from Lagos, 600km from Kauna and about 500km from Abuja, the Federal Capital of Nigeria. The present-day Ilorin cuts across three local government areas namely Ilorin West, Ilorin East, and Ilorin South Local Government Areas, and it has about twenty wards. This study took place in the four major supermarkets in Ilorin; these supermarkets include Shoprite, Gomola, Matrite and B-System supermarkets.
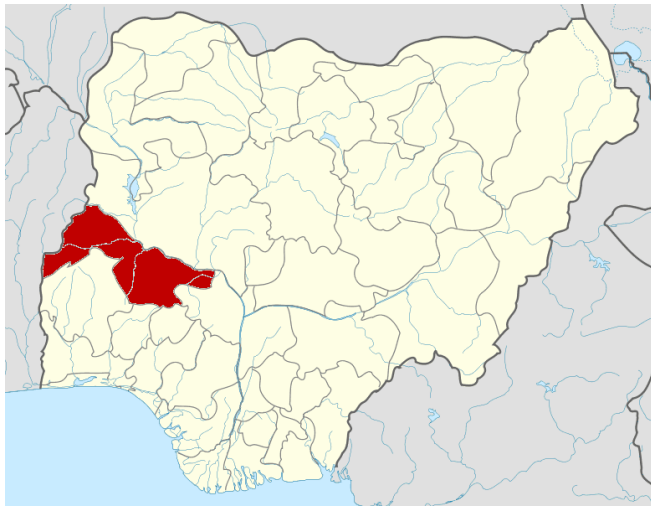
Figure 2.1: Map of Nigeria showing the location of Kwara state, study area

2.2 Sources of Data and Sampling Technique

Data was collected from the primary source through the use of well-structured questionnaires. The four major supermarkets in Ilorin metropolis were selected, they are Maltrite supermarket, B-system supermarket, Shoprite Shopping Mall, and Gomola Supermarket. A total of one hundred and nineteen questionnaires were used, which were distributed to the customers of each supermarket selected randomly. Data were collected on the socio-economic characteristics of the respondents, which include sex of the respondent, gender, marital status, educational status and their occupation. Data were also collected on the respondents' household consumption pattern of canned food which include; the quantity of canned food consumed monthly, the price of canned food consumed, the frequency of consumption, and the amount spent on it monthly, Data were also collected about the respondents' awareness of the various varieties of canned food available.

Data were also collected on the expenditure on food and non-food items by the household. With a theory-based model and using relatively balanced explanatory variables, a convenience sample will be used to obtain model-based inferences [6].

2.3 Data Analysis

Descriptive analysis, Pair T-Test and the Almost Ideal Demand System were used for data analysis. Descriptive analysis used in the study include measures of central tendency, dispersion and frequency distribution. The descriptive statistical tools were used to analyse the socio-economic characteristics of canned food consumers in the study area.

The Almost Ideal Demand System (AIDS) model developed by [7] has enjoyed popularity in applied demand analysis. The AIDS model stems from the neoclassical theory of consumer demand. It has been the most commonly used method for analysing consumer demand. It has been the most useful method of analysing consumers' behaviour, and it can readily be generalized to the aggregate consumption [8]. The model is most favoured in demand analysis because it avoids non-linear estimation; it is flexible and allows for wider range of variables to be included in household demand

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modelling. It is a versatile system capable of studying various aspect of food demand and its various component. In terms of budget shares, this is given by:

$$S_i = \alpha_i + \sum_{j=1}^{n} \gamma_{ij} \ln p_j + \beta_i \ln\left(\frac{m}{P}\right) + e_t$$

S_i = budget share of ith commodity; α_i = constant coefficient ith shared equation; γ_{ij} = slope coefficient associated with the jth commodity in the ith share equation; p_j = price of the jth commodity; m= total expenditure on the system of good.

In this study, the household expenditure was assumed to be on four major categories. Which are: Food items and Non-food items. The food item will be further subdivided into seven subgroups: canned food; fruits and vegetable; root and tubers; animal protein sources; fat and oil; legumes and cereals. But for the purpose of this study, only canned food will be concentrated on. The canned food will be classified into six items namely: canned fruit; canned vegetables; canned legume; canned beverage; canned soup and other canned foods.

Furthermore, income elasticity, own price elasticity, and cross-price elasticity can be computed from the AIDS model by using the following formulae [9].

Income elasticity, $\acute{\eta}_{ij} = 1 + \frac{\beta_i}{w_i}$

Own price elasticity, $\acute{\eta}_{ij} = -\delta_{ij} + \frac{\gamma_{ij}}{w_i}$; Where $\delta_{ij} = 1$ for $i = j$ and $\delta_{ij} = 0$ for $i \neq j$

The elasticity estimated with the above formulae are referred to as Marshallian elasticity. To meet the objectives of this study, associated parameters and demographic variables will be included in the model as explanatory variables alongside the price and income variables specified in the AIDS model. The price variable specified in the AIDS model includes the price of the canned fruit, the price of canned legume, the price of canned vegetable, the price of canned soup, the price of canned meat/fish

and price of other canned food. The Almost Ideal Demand System was used to examine the determinants of household food demand. The AIDS model shows the relationship between budget shares of various classes of canned food and the logarithm of real total expenditure, logarithm of relative price and vector of other independent variables.

3.0 RESULTS AND DISCUSSION

This section explains the results obtained from the descriptive and explanatory analysis carried out to answer the research questions. Table 3.1 presents the results of the socioeconomic characteristic of the respondents interviewed during the survey.

From Table 3.1, 49.6% of the respondents are male while about 50.4% are female. Results also show that 53.6% are married, 32.9% are single, and 4.2% are divorced and 6.7% are widowed. The educational distribution of the respondents showed that 88.2% of them had tertiary education, 3.4% had no formal education. Also, the result of the survey showed that 27.7% of the household head (respondents) were less than 30years of age, 31.1% were about 30-39 years, 23.5% were between 40-49 years old and 17.6% were found to be 50 years old and above. Furthermore, 31.1% of the respondents earn less than ₦50,000, 21.8% of the respondents earn between ₦50,000 and ₦99,999, 14.3% of the respondents earn between ₦100,000 and ₦149,999 and 32.8% of the respondents earn ₦150,000 and above. Table 3.2 shows the factors affecting pattern of demand for canned food.

Table 3.1: Socioeconomic Characteristics of Respondents

Socio-Economic Characteristics	Frequency (N=119)	Percentage
Gender		
Male	59	49.6
Female	60	50.4
Marital Status		
Single	38	31.9
Married	67	56.3
Divorced	5	4.2
Widowed	8	6.7
Education Status		
No formal education	4	3.4
Primary education	4	3.4
Secondary education	5	4.2
Tertiary education	105	88.2
Adult education	1	0.8
Age in years		
<30	33	27.7
30-39	37	31.1
40-49	28	23.5
50 years and above	21	17.6
Monthly income in naira		
<50,000	37	31.1
50,000-99,999	26	21.8
100,000-149,999	17	14.3
150,000 and above	39	32.8
Household Size		
1-5	73	61.3
6-10	37	31.1
11-15	6	5
16 and above	3	2.5
Years of Schooling		
0-6	12	10.1
7-12	7	5.9

Table 3.1 (*continued*)

Socio-Economic Characteristics	Frequency (N=119)	Percentage
13-16	68	57.1
17 and above	32	26.9

Table 3.2: Pattern of Demand for Canned Food

Pattern		Frequency	Percentage
*Variety	**Awareness**		
Canned fruit	Aware	88	73.1
	Not aware	31	26.1
Canned vegetable	Aware	74	62.2
	Not aware	75	37.8
Canned fish/meat	Aware	94	79
	Not aware	24	20.2
Canned legume	Aware	86	72.3
	Not aware	33	27.7
Canned beverage	Aware	100	84
	Not aware	18	15.1
Canned soup	Aware	48	40.3
	Not aware	71	59.7

Beef consumption frequency	Frequency	Percentage
Daily	32	26.9
Twice a week	38	31.9
Thrice a week	24	20.2
Four times a week	8	6.7
Five times a week	6	5
Does not consume	11	9.2
Total	119	100

Table 3.2 (*continued*)

Pattern		Frequency	Percentage
***Place of sale**	**Place of purchase**		
Supermarket only	Yes	89	74.8
	No	27	22.7
Supermarket and open market	Yes	23	19.3
	No	96	80.7
Supermarket and retail shops	Yes	22	18.5
	No	97	81.5
Amount spent in Naira			
< 5,000		73	61.3
5001-10,000		23	19.3
10,001-15,000		13	10.9
> 15,000		10	8.4
Total		119	100
***Reason for Consumption**			
Cheap		53	44.5
Easy to prepare		69	58
Safety		42	35.3
Delicious		52	43.7
Shelf life		36	30.3
Convenience		69	58

Source: Field Survey, 2014
*Multiple responses

Table 3.2 provides information about the awareness of respondents about the various class of canned food. Respondents that consume canned food twice a day took the highest percentage from the population sample, closely followed by those that consume canned food daily, while the least percentage are those who consume canned food five times in a week.

Also, on Table 3.2 is data on the place of purchase of canned food by the respondents. Majority of the response purchase their canned food from supermarkets which forms 74.8% of the population, 23% of the population purchase their canned food from both supermarket and open market while 22% of the population purchase their canned food from both supermarket and retail shops. The results of the survey show that 61.3% of the respondents spend about 0 - ₦5,000, 19.3% of respondent spend about ₦5001 to ₦10,000, 10.9% of respondent spend about ₦10,001 to ₦15,000 while 8.4% of respondents spend about ₦15000 and above on canned food monthly.

3.1   Determinants of Demand for Canned fruit

The R-squared value of 0.7833 in the share equation of canned fruit indicates that the independent variable explains about 78.33% of the variations in the demand for canned fruit. Factors affecting the share of each of the fruit's expenditure in the total canned food expenditure are given in Table 3. The negative significant coefficient of the price of canned fruit implies that an increase in the price of canned fruit will cause the household to reduce their budgetary allocation to canned fruit by the value of the coefficient 0.137.

3.2   Determinant of demand for canned food

Tables 3.4 to 3.9 show the determinants of demand for each of the canned food items considered during this study. This food items include vegetables (Table 3.4), legumes (Table 3.5), meat and fish (Table 3.6), beverages (Table 3.7), soup (Table 3.8) and other canned food items (Table 3.9)

Table 3.3: Coefficient of Determinants of Demand for canned fruit

Variables	Coefficient	T-value
Constant	1.4777***	10.09
Age	6.67×10^{-4}	1.58
Education	4.65×10^{-4}	0.37
Household size	3.51×10^{-3}**	-2.28
Total canned food expenditure	1.09×10^{-5}***	12.70
Price of canned fruit	-0.1369***	-9.59
Price of canned vegetable	1.11×10^{-2}	-0.88
Price of canned legumes	3.72×10^{-2}*	2.74
Price of canned meat/fish	-1.58×10^{-2}	-1.12
Price of canned beverage	6.71×10^{-3}	0.89
Price of canned soup	3.60×10^{-3}	0.51
Price of other canned foods	1.23×10^{-2} ***	1.16
R-square	0.7833	

Source: Field Survey, 2014.   ***=sig at 1%, **=sig at 5%

Table 3.4: Coefficient of Determinants of Demand for canned vegetable

Variables	Coefficient	T-value
Constant	1.3154***	10.95
Age	7.51×10^{-4}**	2.21
Education	8.30×10^{-4}	-0.87
Household size	2.33×10^{-3}*	-2.28
Total canned food expenditure	9.57×10^{-6}***	13.43
Price of canned fruit	0.0126	1.36
Price of canned vegetable	-0.1342	-10.95
Price of canned legumes	2.19×10^{-2}**	1.99
Price of canned meat/fish	2.15×10^{-3}	0.19
Price of canned beverage	5.79×10^{-4}	0.10
Price of canned soup	5.68×10^{-3}	0.98
Price of other canned foods	1.33×10^{-3}	0.15
R-square	0.7411	

Source: Field Survey 2014   *** = sig at 1%, ** = sig at 5%, *= 10%

Results from Table 3.4 show that the R-square value of 0.7411 in the share equation of canned vegetable indicated that the independent variable explained about 74.11% of the variations in the demand for canned vegetable. The negative significant coefficient of the price of canned vegetable implies that an increase in the price of canned vegetable will cause the household to reduce their budgetary allocation to canned vegetable by the value of the coefficient (0.7411).

Table 3.5: Coefficient of Determinant of Demand for Canned Legumes

Variables	Coefficient	T-value
Constant	1.177***	15.25
Age	3.07×10^{-4}**	1.47
Education	5.19×10^{-4}	0.84
Household size	1.23×10^{-3}	-1.62
Total canned food expenditure	8.48×10^{-6}***	19.99
Price of canned fruit	6.86×10^{-4}	0.12
Price of canned vegetable	3.21×10^{-3}	0.53
Price of canned legumes	-0.104***	-13.23
Price of canned meat/fish	1.57×10^{-2}**	2.25
Price of canned beverage	3.12×10^{-3}	-0.83
Price of canned soup	1.25×10^{-2}*	3.42
Price of other canned foods	-4.31×10^{-3}	-0.82
R-square	0.8754	

Source: Field Survey 2014   *** = sig at 1%, ** = sig at 5%   *=sig at 10%

From Table 3.5, the R-squared values reveal that the independent variables explain about 87.54% of the total variation in the demand for canned legumes among household. Factors affecting the share of canned legume in the total canned food expenditure are presented in Table 3.5. The price of canned legume has a negative significant impact on the share of expenditure allocated to canned legume. This is consistent with the theory of demand, that is, if the price of a commodity increases, the quantity demanded of the commodity will decrease. The value of the coefficient of the

price of canned legume given as -0.1039 implies that if the price of canned legume is increased by a unit naira, the household budgetary allocation will decrease by a magnitude of 0.1039

Table 3.6: Coefficient of Determinant of Demand for Canned meat/fish

Variables	Coefficient	T-value
Constant	1.416***	13.19
Age	1.42×10^{-5}**	-0.05
Education	1.00×10^{-3}	1.14
Household size	1.10×10^{-3}	-1.01
Total canned food expenditure	1.0×10^{-5}***	18.02
Price of canned fruit	1.33×10^{-2}	1.63
Price of canned vegetable	6.81×10^{-3}	0.79
Price of canned legumes	1.30×10^{-2}	1.34
Price of canned meat/fish	-0.124***	-10.23
Price of canned beverage	8.89×10^{-3}*	-1.66
Price of canned soup	2.22×10^{-3}	0.44
Price of other canned foods	-7.84×10^{-3}	-1.04
R-square	0.8611	

Source: Field Survey 2014   *** = sig at 1%, ** = sig at 5%,   *= sig at 10%

As shown on Table 3.6, the R-square values reveal that the independent variables explain about 86.11% of the total variation in the demand for canned fish/meat. Factors affecting the share of canned fish/meat in the total canned food expenditure are presented in Table 3.6. The price of canned fish/meat has a negative significant impact on the share of expenditure allocated to canned fish/meat. This is consistent with the theory of demand, that is, if the price of a commodity increases, the quantity demanded of the commodity will decrease. The value of the coefficient of the price of canned fish/meat is given as -0.124 implies that if the price of canned legume is increased by a unit naira, the household budgetary allocation will decrease by a magnitude of 0.124

Table 3.7: Coefficient of Determinant of Demand for Canned Beverage

Variables	Coefficient	T-value
Constant	2.195***	13.07
Age	6.40×10^{-4}	1.32
Education	2.13×10^{-3}	1.48
Household size	9.4×10^{-5}	-0.05
Total canned food expenditure	1.38×10^{-5}***	15.69
Price of canned fruit	1.33×10^{-2}	1.00
Price of canned vegetable	8.65×10^{-3}	0.62
Price of canned legumes	0.033**	2.08
Price of canned meat/fish	0.011	0.67
Price of canned beverage	-0.243***	-19.57
Price of canned soup	1.39×10^{-2}**	1.71
Price of other canned foods	-6.68×10^{-3}	-0.55
R-square	0.7693	

Source: Field Survey 2014   *** = sig at 1%, ** = sig at 5%   *=sig at 10%

As shown on Table 3.7, the R-square value of 0.7693 reveals that the independent variables explain about 76.93% of the total variation in the demand for canned beverage. Factors affecting the share of canned beverage in the total canned food expenditure are presented in Table 3.7. The price of canned beverage has a negative significant impact on the share of expenditure allocated to canned beverage. This is consistent with the theory of demand, that is, if the price of a commodity increases, the quantity demanded of the commodity will decrease. The value of the coefficient of the price of canned beverage is given as -0.243 implies that if the price of canned beverage is increased by a unit naira, the household budgetary allocation will decrease by a magnitude of 0.243.

Other canned foods consumed by the consumers include canned peanut butter, canned hotdog, canned sandwich and canned pizza. The R-square value of 0.8209 reveals that the independent variables explain about 82.09% of the total variation in the demand for canned soup. Factors

affecting the share of canned soup in the total canned food expenditure are presented in Table 3.8. The price of canned soup has a negative significant impact on the share of expenditure allocated to canned soup. This is consistent with the theory of demand, that is, if the price of a commodity increases, the quantity demanded of the commodity will decrease. The value of the coefficient of the price of canned soup is given as -0.0579 implies that if the price of canned soup is increased by a unit naira, the household budgetary allocation will decrease by a magnitude of 0.0579**.**

Table 3.8: Coefficient of Determinant of Demand for Canned Soup

Variables	Coefficient	T-value
Constant	0.572***	7.11
Age	2.62×10^{-4}	1.20
Education	1.84×10^{-4}	-0.28
Household size	2.7×10^{-3}***	-3.46
Total canned food expenditure	6.07×10^{-6}***	11.71
Price of canned fruit	1.03×10^{-2} *	1.72
Price of canned vegetable	3.91×10^{-3}	0.62
Price of canned legumes	0.015**	2.07
Price of canned meat/fish	0.011	1.43
Price of canned beverage	5.85×10^{-3}	1.50
Price of canned soup	-5.79×10^{-2}***	-8.80
Price of other canned foods	3.80×10^{-3}	0.67
R-square	0.8209	

Source: Field Survey 2014   *** = sig at 1%, ** = sig at 5%   *=sig at 10%

The R-square value of 0.8209 reveals that the independent variables explain about 82.09% of the total variation in the demand for other canned foods. Factors affecting the share of other canned food in the total canned food expenditure are presented in Table 3.9. The price of other canned food has a negative significant impact on the share of expenditure allocated to it. This is consistent with the theory of demand, that is, if the price of a commodity increases, the quantity demanded of the commodity will decrease. The value of the coefficient of the price of other canned food is given as -0.0579 implies that if the price of other canned food is increased by a unit naira, the household budgetary allocation will decrease by a magnitude of 0.0579

Table 3.9: Coefficient of Determinant of Demand for Other Canned Foods

Variables	Coefficient	T-value
Constant	0.149***	5.22
Age	8.73×10^{-5}	1.27
Education	1.84×10^{-4}	-0.01
Household size	1.74×10^{-4}	-0.70
Total canned food expenditure	1.86×10^{-6}***	9.22
Price of canned fruit	4.83×10^{-3} *	2.59
Price of canned vegetable	4.83×10^{-3}**	2.23
Price of canned legumes	6.16×10^{-3}***	2.81
Price of canned meat/fish	1.01×10^{-3}	0.43
Price of canned beverage	3.39×10^{-4}	-0.28
Price of canned soup	8.23×10^{-4} ***	0.72
Price of other canned foods	-0.011***	-3.11
R-square	0.8209	

Source: Field Survey 2014   *** = sig at 1%， ** = sig at 5% , *=sig at 10%

3.3   Analysis of elasticity of demand for canned foods
This section shows the results of the own price, cross price and income elasticities of the canned food items consumed by the respondents.

3.3.1   Own price Elasticity
Own price elasticity measures the degree of responsiveness of the budget share allocated to various canned food classes as their respective prices change. The estimated parameters of the AIDS equation form the basis of elasticities which are important for assessing the impact of policies on quantity demanded. The Marshallian own price

and cross price elasticity as shown in Tables 3.10 and 3.11

Table 3.10: Own-price elasticity of canned food

Class of canned food	Own-price Elasticity
Canned fruit	-1.656
Canned vegetable	-0.936
Canned legume	-0.594
Canned meat/fish	-0.960
Canned beverage	-0.746
Canned soup	-0.875
Other canned food	-0.390

Source: Field Survey, 2014

The magnitude also shows that they are elastic and sensitive to changes in their own price. The own-price elasticity for canned fruit (1.656) is greater than one, implying that the prices have elastic relationship with the quantities demanded. The other classes of canned food have their own-price elasticity less than one. The negative signs on the elasticity coefficient are indicative that the prices of the respective canned food classes increased the relative share (in percentage) of canned food expenditure decreased more than proportionately for each of the canned food class in the study area. For instance, 10% increase in the price of canned fruit, canned vegetable, canned legume, canned meat/fish, canned beverage, canned soup, other canned food would lead to 16.65%, 9.36%, 5.94%, 9.60%, 7.46%, 8.75%, 3.90% reduction in the demand of the respective food items. However, the result satisfies a priori theoretical expectation and is consistent with the Engel's finding which says that the price elasticity coefficient is normally negative

3.3.2 Cross –price Elasticity

The estimates of cross price elasticity of canned fruit, canned vegetable, canned legume, canned meat/fish, canned beverage, canned soup and other canned food in response to the changes in their prices. This shows prevalence of substitution between canned fruit, canned vegetable, canned legume, canned meat/fish, canned beverage, canned soup, and other canned foods as shown in Table 3.11.

a) Canned fruit and canned vegetable: The cross-price elasticity of canned fruit and canned vegetable is -0.653, this indicates that when the price of canned fruit increases by 1%, the demand for canned vegetable will decline by 65.3%.

b) Canned fruit and canned legume: the cross-price elasticity of canned fruit and canned legume is 0.162. This means that when the price of canned fruit increase by 1%, the demand of canned legume will also increase by 16.2%

c) Canned fruit and canned meat/fish: the cross-price elasticity of canned fruit and canned fish/meat is 0.183. This means that when the price of canned fruit increase by 1%, the demand of canned meat/fish will also increase by 18.3%.

d) Canned fruit and canned beverage: the cross-price elasticity of canned fruit and canned beverage is 0.194. This means that when the price of canned fruit increase by 1%, the demand of canned meat/fish will also increase by 19.4%.

e) Canned fruit and canned soup: the cross-price elasticity of canned fruit and canned soup is 0.166. This means that when the price of canned fruit increase by 1%, the demand of canned soup will also increase by 16.6%.

f) Canned fruit and other canned foods: the cross-price elasticity of canned fruit and other canned foods is 0.169. This means that when the price of canned fruit increase by 1%, the demand of other canned food will also increase by 16.9%.

Table 3.11: Cross-price elasticity of canned foods

Canned food	Cross-price elasticity
Canned fruit and canned vegetable	-0.653
Canned fruit and canned legume	0.162
Canned fruit and canned meat/fish	0.182
Canned fruit and canned beverage	0.194
Canned fruit and canned soup	0.166
Canned fruit and other canned food	0.169

Source: Field survey 2014

3.3.3 Income Elasticity

Table 3.12 shows the income elasticities of demand for the various class of canned food. The income elasticity of canned fruit, canned vegetable, canned legume, canned meat/fish, and canned beverage have positive values. This indicates that a 10% increase in income level of the respondents will increase the demand of canned fruit, canned vegetable, canned legume, canned meat/fish, and canned beverage by 7.9%, 12.5%, 7.5%, 13.0%, and 21.4% respectively. On the other hand, a 10% increase in the income level of respondents will decrease the demand for canned soup and other canned food by 4.5% and 5.9% respectively.

Table 3.12: Income Elasticity

Class of canned food	Income elasticity
Canned fruit	0.079
Canned vegetable	0.125
Canned legume	0.075
Canned meat/fish	0.130
Canned beverage	0.214
Canned soup	-0.045
Other canned food	-0.059

Source: Field Survey 2014

4.0 CONCLUSION AND POLICY RECOMMENDATION

Canned food is one of the most demanded items among customers of the Shoprite, B-system, Gomola and Matrite supermarkets in Ilorin, Kwara state, but there are still people who do not consume canned food. The result of the study showed that canned food is price elastic. The estimates of the cross-price elasticity reveal that the classes of canned food studied have both positive and negative sign implying that some food types are complementary while others are substitute.

In conclusion, the survey showed that despite the recent consumption behaviour, consumers in the four selected supermarkets still like canned food, and there are good opportunities for canned food producers, if they will provide good information about canned food to consumers.

References

[1] Alfnes F. (2004) stated preference of imported and hormone treated beef: application of mixed logit model. *European Review of Agricultural Economics* 31(1), 19-37.

[2] Carola Grebitus C., Yue C., Bruhn M. & Jensen H. H. (2007) What Affects Consumption Patterns of Organic and Conventional Products? Poster Paper prepared for presentation at the American

Agricultural Economics Association Annual Meeting, Portland.

[3]   Grunert K. G. (2005) Food quality and safety: Consumer perception and demand. *European Review of Agricultural Economics* 32 (3): 369-291

[4]   Roosen J. (2003) Marketing of Safe Food Through Labelling. *Journal of Food Distribution Research* 34(3): 77-82

[5]   NBS (2014) National Bureau of Statistics (NBS), Abuja, Nigeria

[6]   Rodríguez E., Lupín B. & Lacaze M. V. (2006) Consumers' perceptions about food quality attributes and their incidence in Argentinean organic choices Poster paper prepared for presentation at the International Association of Agricultural Economist Conference, Gold Coast, Australia

[7]   Deaton A. & Muellbauer J. (1980). An Almost Ideal Demand System. *Am. Econ. Rev*. 70:312-336

[8]   Ramíreza A. (2013) A Multi-Stage Almost Ideal Demand System: The Case of Beef Demand in Colombia. Revista Colombiana de Estadística, 36(1):23-42

[9]   Ivanova N. (2005) Estimation of Own- and Cross-Price Elasticities of Disaggregated Imported and Domestic Goods in Russia World Bank Policy Research Working Papers