



Research Article

Analysis of Demand for Fruits among Households in Kwara State, Nigeria

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Abstract

Fruits and vegetables' consumption is germane in obtaining food and nutritional security but, its consumption is far below the minimum nutritive recommendation in Nigeria. Thus, this study analyzed the demand for fruits among households in Kwara State. A multistage random sampling technique was used to select 300 respondents. A well-structured interview schedule was used to collect information on socio-economic features, types of fruits consumed, frequency of consumption, consumption patterns, demand for fruits and factors influencing the demand for fruits in Kwara. Descriptive statistics and Linear Approach Almost Ideal Demand System (LA-AIDS) were used to achieve the research objectives. Majority (80%) of the respondents were males with a mean age and monthly income of 51 years and N56, 381 respectively. The study revealed that mango is the most frequently consumed fruit with mean score of 3.29, this was narrowly followed by cashew (2.97), Banana (2.69), Watermelon (2.66), Orange (2.59), Cherry (2.12), while Pineapple (2.06) is the least frequently consumed fruit. The consumption pattern indicated that respondents earn an average income of N56, 227 and they spent most (49.79%) of their incomes on food and least (8.48%) on fruits. LA-AIDS showed positive and significant cross parameter. The demand for fruits was influenced by perception, level of income, and storage facilities with the mean score of 3.69, 3.65, and 3.65 respectively. The study therefore recommends the need to change the perception of the people through aggressive sensitization on the benefits inherent in fruits consumption. Policies and strategies towards making efficient storage facilities available to households to enhance bulk purchases of fruits should be encouraged.

Keywords: Consumption, frequency, fruits, households, and LA-AIDS

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Introduction

Fruit can be regarded as a seed-bearing part of any flowering plant or tree that could be consumed as food. Hence, foods such as avocados, cucumbers, squash and tomatoes can be considered as fruits. A fruit is also any nice-perceive plant product with seeds. Botanically, fruits are the mature ovary of a seed bearing plant that contains the seed(s), which have emanated from the enclosed ovule after fertilization. Besides, growth with the absence of fertilization is familiar, for example, in bananas. (Agwu, 2011).

Fruits and vegetables consumption in required amount and standard is an indication of a good

and healthy diet. Fruits and vegetables intake is a relevant diet for weight management and protection against overweight and obesity. This function is possible due to their relatively small energy density, high content of dietary fiber and related rising satiety impact. Fruits such as apples, oranges, grapes, strawberries and bananas are very good origin of relevant vitamins and minerals, as well as high fiber content which are needed for the normal wellbeing of a human body (Fadeiye *et al*; 2019). Fruits containing a high amount of anthocyanins, flavonols, and procyanidins, such as berries, grapes, and pomegranate, are effective at de

creasing cardiovascular risk while citrus fruits and apples had a moderate effect on blood pressure and blood lipid level (Habauzit *et al.*, 2013). Fruits is related to a wide range of health-boosting antioxidants, including flavonoids. They also have the capacity to either reduce or reverse the degenerative changes that may occur with old age (Johnson *et al.*; 2012; Olatona *et al.*; 2018).

Despite all the accrued benefits, fruits and vegetables consumption still falls below the WHO/FAO least nutritive recommended rate of 400g/ individual/ day or 146kg per/individual/year in Nigeria (Banwat *et al.*; 2012). Most households prefer to sell their fruits upon harvest for money rather than consuming them due to their low income situation. Low income households are associated with a poor quality nutritive intake when compared to those with higher income households. Besides, little or nothing is known about the inherent benefits that can be derived from fruits consumption by the households. Consequently, the effect on health and nutritional security of the households could be catastrophic (Hall *et al.*; .2009). Therefore, this study analyzed the demand for fruits and identified factors influencing the demand for fruits among households in the study area.

Materials and Methods

This study was carried out in Kwara State. Kwara is located within the North Central geopolitical zone Kwara State is situated between parallels 8° and 10° north latitudes and 3° and 6° east longitudes. It is bounded in the north, east, south and west by Niger, Kogi, Osun and Republic of Benin respectively. The mean temperature ranges between 27°C and 35°C with a mean annual rainfall of 1,000-1,500mm. It has two main seasons- wet and dry. The wet season comes between early April and late October while the dry season is between November and late March. The State is an inland water state naturally blessed with large volumes of water with an estimated population of about 2,365,353 (NPC, 2006). Due to ecological features, cultural practices and project administrative convenience, the state is divided into four zones. These are: Zone A: Baruteen and Kaima Local Government Areas (LGAs);

Zone B: Edu and Patigi LGAs; Zone C: Asa, Ilorin East, Ilorin South, Ilorin West and Moro LGAs and Zone D: Ekiti, Ifelodun, Irepodun, Offa, Oyun, Isin and Oke-Ero LGAs (KWADPs, 2018) (Figure1).

Primary data was employed for this study. The data were obtained from a field survey through the use of a well-structured questionnaire, administered through personal interview. The questionnaire was design to elicit information on socio economics characteristics of household head, quantity of fruits consumed, household's income, and household monthly expenditure on fruits among others.

A multi-stage sampling technique was used to select the representative households for this study, Moro and Baruteen LGAs were purposely selected out of the 16 LGAs in Kwara state. These 2LGAs are the most rural and have high concentration of fruits and vegetables sellers in Kwara. There are 15 and 11 districts in Moro and Baruteen LGAs respectively. The second stage involved proportional selection of 3 and 2 districts in Moro and Baruteen LGAs respectively. The third stage involved random selection of 5 villages in each of the district. In the last stage, 12 households were randomly selected in each of the villages to make up a sample size of 300 respondents.

Descriptive statistical tools were used to describe the frequency and fruits' consumption patterns among the respondents. LA_AIDS was used to estimate the demand as well as determine factors influencing the demand for fruits among households in the study area According to Salau and Omotsho, (2017), the model is given as:

$$w_i = \alpha_i + \sum_j \gamma_{ij} \log P_j + \beta_i \log \left(\frac{x}{p^*} \right) + \theta \log Age + \delta \log Du + \varepsilon \log Epd$$

Where:

w_i = budget share of i community group with $i = 1, 2, 3 \dots n$

α, β, γ = regression parameter for intercept, fruit expenditure (with the weighing price) $cczz$ and aggregate price from each commodity

$\theta, \delta, \varepsilon$ = regression parameters for the household size, years of education and total expenditure of household

P_j = aggregate price of j^{th} commodity

$\left(\frac{x}{p*}\right)$ = fruit expenditure is divided by the index

weighing price

Age = Age of the household head

Du = education level of household's head

Epd = total expenditure of household

Results and Discussion

Socioeconomic features of respondents

Table 1, indicated that 80% of the household head were males while only 20% were females. This was expected as male is the head of the family in this part of Africa. About 74% of the respondents were between the ages of 31-60 years with an average age of 51 years. This suggests that the respondents were still active. More than half (50.7%) of the respondents had a family size of between 6-10 persons. The average number of person per household is 8 persons which indicate that the households' sizes are fairly large. This could influence the frequency and fruits' consumption pattern. Majority (61%) of the respondents were partially employed while only 33.33% were fully employed. Surprisingly, 5.7% of the respondents were retired. The average monthly income is N56, 381. This implies that the respondents earn a fairly low amount of income. This agrees with the findings of Salau and Omotosho (2017), who found out that rural households in Lagos earn a fairly low amount of income when compared with their urban counterparts.

Frequency of fruit consumed

Mango is the most frequently consumed fruit with a mean score of 3.29. This could be due to the fact that as at the time this research work was conducted, mango was the fruit in season, thereby explaining the cheap price of mango (Table 2).

Mango is followed by cashew (MS =2.97) which could be as a result of the cheap price of apple of cashew. In Kwara state, it is the nut of cashew that is more valued than the pulp. Other frequently consumed fruits are banana and watermelon with mean score of 2.69 and 2.66 respectively.

Consumption pattern of households

The consumption pattern of households is shown in table 3

The average income and food expenditure of an household were ₦56,227 and ₦27996 respectively. The average food expenditure represents 49.79% of the average income. However, a little (₦7,478) which represent 13.29% of the average income was spent on none food expenditure while ₦15, 990 which represents 28.44% was saved. Surprisingly, only ₦4,763 which represents 8.48% of the average income was spent on fruits consumption. This implies that respondents spent higher proportion of their disposable income on food items.

Demand for fruits

The demand for fruits indicates that the coefficient of parameters is positive and significant at different levels ranging from 1-10%. (Table 4)

The coefficient of all own price parameters were positive and significant at 1% level. The variables with positive signs show a direct relationship between the price of another commodity and the commodity expenditure. Few of the cross price parameters are negative and affect fruit expenditure at different levels. The coefficient of age is positive and important for the coefficient of oranges at 10%. This suggests that the more the age the household head the more the budget share (Salau and Omotosho, 2017). Furthermore, the coefficient of education was only significant for the coefficient of oranges at 10% level. Most of the coefficients of income were negative and important at different levels except for the coefficient of oranges and cherry. The negative signs connote as income rises, the percentage of income spent on consumption reduces. The coefficient of household size was not significant; implying that family size does not affects the demand for fruits in the area.

Challenges affecting fruits consumption

Table 5, shows that the most important factor determining fruit consumption is perception with a mean score of 3.69. This is because most respondents still do not know the benefits inherent in fruit consumption. This corroborates

the work of Salau and Omotosho (2017) which stated that perception and level of income were two main factors that hindered the demand of fruits and vegetables.

This was followed by the level of income and storage facilities with a mean score of 3.65 each. The more the income the more the demands for various fruits. Similarly, storage facilities could also enhance the demand for fruits since fruits are highly perishable due to its large moisture content. The presence of storage facilities could facilitate bulk purchases for gradual consumption by the household. Quality consciousness was ranked 4th with a mean score of 3.62. This is because many households are careful about the kind of fruits to be consumed.

Conclusion and Recommendations

This study estimated the demand for fruits in Kwara state. The study revealed that most of the respondents were males who are still within their active years. Mango was the most frequently consumed fruit while cherry was the least. Furthermore, most households spent considerable amount of their disposable income on food while only a bit was spent on fruit consumption. The own price, cross price parameters and income determines the complete demand of fruits. Perception, level of income and storage facilities was the three most pressing factors hindering fruit consumption in the study area. There is the need to change the perception of the people through aggressive sensitization on the benefits of fruits. Provision of storage facilities must be enhanced to facilitate bulk consumption of fruits. Policies and strategies towards making efficient storage facilities available to enhance bulk purchases of fruits should be encouraged.

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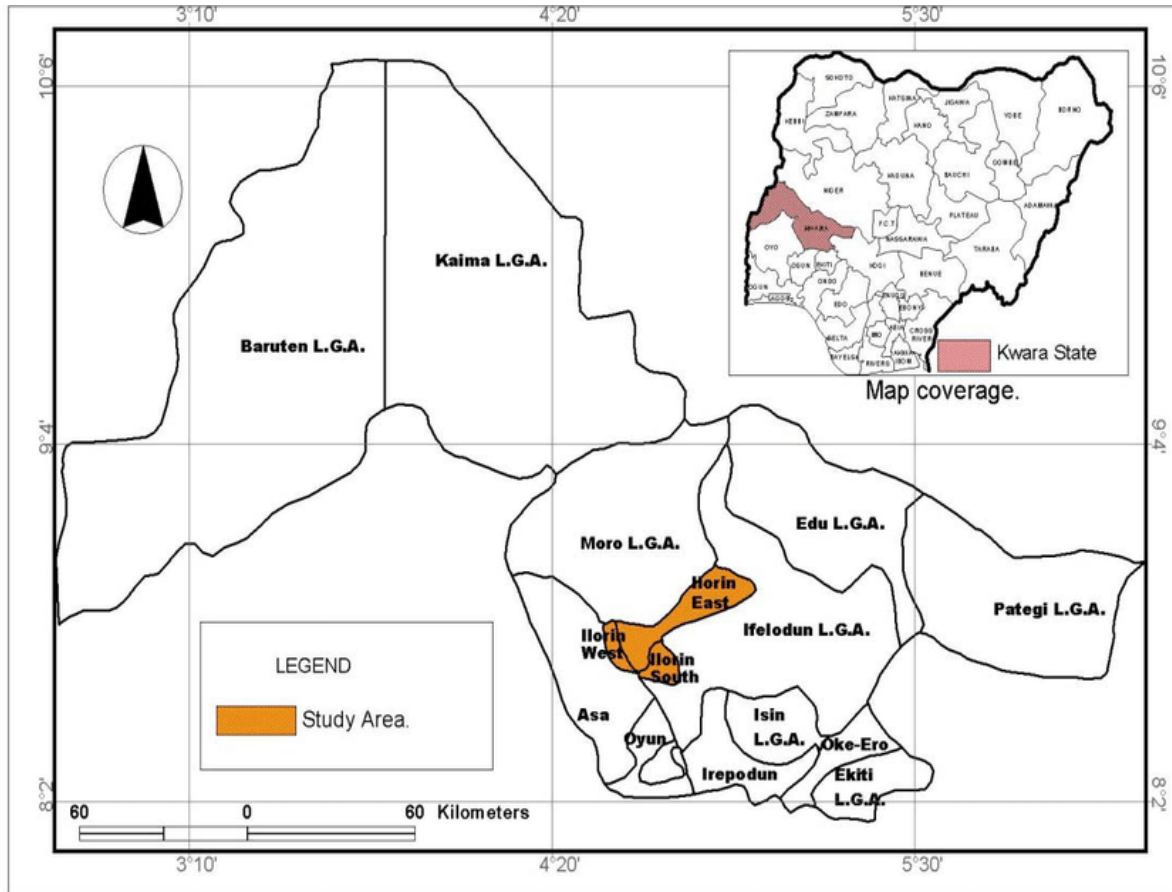


Figure1: Map of Kwara showing the LGAs

Table 1. Socioeconomic features of household head (n=300)

Variable	Frequency	Percentage	Mean
Age			
1- 30	52	17.3	51 years
31-60	224	74.7	
61-90	24	8	
Gender			
Male	240	80	12 years
Female	60	20	
Level of education			
1 - 6	142	47.3	12 years
7 – 12	114	38.0	
13-18	44	14.7	
Employment status			
Retired	17	5.7	61.0
Partially employed	183	61.0	

Fully employed	100	33.3	
Household size			
1 - 5	148	49.3	
6- 10	152	50.7	8 persons
Main source of income			
Farming	187	62.3	
Others	113	37.7	
Access to co-operative			
Yes	178	59.3	
No	122	40.7	
Farm size (hectares)			
1 -5	228	76.0	
6-10	72	24.0	
Monthly income			
30, 000- 69,000	253	84.3	56, 381
70, 000- 109,000	47	15.7	
1,500001- 2000000	86	40.6	

Source: field survey, 2022

Table 2. Frequency of fruit consumption by households

Fruits	Everyday	2-3 times	Once	Occasionally	mean	Std dev	Rank
Orange	74(24.7)	69(23.0)	118(39.3)	39 (13.0)	2.59	0.99	5 th
Banana	85(28.3)	75(25.0)	101(33.7)	39 (13.0)	2.69	1.02	3 rd
Watermelon	82(27.3)	84(28.0)	83(27.7)	51(17.0)	2.66	1.05	4 th
Mango	190(63.3)	38(12.7)	42 (14.0)	30 (10.0)	3.29	1.04	1 st
Pineapple	38(12.7)	61(20.3)	81 (27.0)	120(40.0)	2.06	1.05	7 th
Cherry	28(9.3)	75(25.0)	102(34.0)	95(31.3)	2.12	0.96	6 th
Cashew	142(46.0)	42(14.0)	84(28.0)	36(12.0)	2.97	1.17	2 nd

Table 3: Consumption patterns

Items	Amount/month in ₦	Percentage
Average income	56,227	
Average food expenditure	27,996	49.79
Average Nonfood expenditure	7, 478	13.29
Average savings	15, 990	28.44
Average Fruit expenditure	4, 763	8.48

Source: field survey, 2022

Table 4: Demand for fruits among the respondents

	Cashew	Banana	Watermelon	Mango	Pineapple	Cherry	Orange
Intercept	6.10673* ** (1.01906)	-2.23500 (1.43573)	4.20324* ** (0.984668)	5.94128** * (0.890920)	5.76423** * (1.07056)	4.31474* ** (0.948168)	6.08691 (1.73049)
Ln (price of orange)	0.001334 03*** (4.67398e-05)	0.165312* ** (0.0410067)	0.007985 36 (0.0279763)	-0.044219 5* (.0255786)	0.0227038 (0.0317667)	0.069583 4** (0.0272183)	-0.01585 28 (0.0508812)
Ln (price of banana)	0.128087 *** (0.0303485)	0.0005370 92*** (3.41377e-05)	0.119738 *** (0.0280386)	0.0319955 (0.0263535)	-0.019398 1 (0.0327520)	0.067397 3** (0.0281610)	-0.00736 199 (0.0523476)
Ln(price of watermelon)	0.020320 2 (0.0317404)	0.209214* ** (0.0426308)	0.001235 21*** (4.18300e-05)	-0.003493 00 (0.0268835)	0.0884671 *** (0.0330413)	-0.03976 26 (0.0288904)	0.108917 ** (0.0533021)
Ln(price of mango)	-0.00639 560 (0.0305475)	-0.030267 3 (0.0426469)	0.018859 7 (0.0282938)	0.0010680 5*** (3.06625e-05)	0.0460096 (0.0320780)	0.044384 2 (0.0276721)	0.309364 *** (0.0486064)
Ln(price of pineapple)	0.023052 1 (0.0280788)	0.0180717 (0.0392827)	0.075757 9*** (0.0256592)	0.0018298 3 (0.0238184)	0.0015996 9*** (5.46261e-05)	0.074027 0*** (0.0253375)	-0.04925 96 (0.0472905)
Ln(price of cherry)	0.080770 ***2 (0.0288897)	0.0812268 ** (0.0405672)	-0.00910 256 (0.0270266)	0.0436098 * (0.0245935)	0.119844 *** (0.0303764)	0.001900 49*** (5.63179e-05)	0.132316 *** (0.0487060)
Ln (price of cashew)	-0.02636 00 (0.0253727)	0.0376350 (0.0354572)	0.050575 9** (0.0233909)	0.0247044 (0.0214832)	-0.009121 40 (0.0266720)	0.046629 2 (0.0229115)	0.000521 924 (3.19415e-05)
Ln(age)	-0.03731 40 (0.0982133)	-0.266308 (0.137011)	0.081251 6 (0.0909517)	0.0957340 (0.0830166)	0.0141075 (0.103380)	-0.09924 20 (0.0890465)	-0.30914 5* (0.165009)
Ln (education)	0.052230 7 (0.0510529)	-0.010843 6 (0.0713876)	-0.01058 61 (0.0473603)	-0.023945 7 (0.0432655)	-0.002722 48 (0.0538699)	-0.07069 51 (0.0463423)	-0.16432 3* (0.0857804)
Ln(income)	-0.18814 9* (0.0983534)	0.578880* ** (0.133853)	-0.06574 49** (0.0922860)	-0.089310 8** (0.0839983)	-0.205368 * (0.103614)	-0.03853 20 (0.0900817)	-0.16037 5 (0.166372)
Ln(household size)	-0.01426 84 (0.0450618)	-0.043427 0 (0.0628540)	0.011946 5 (0.0417394)	0.0046813 8 (0.0381441)	0.0569466 (0.0477792)	0.016703 3 (0.0409422)	0.037664 2 (0.0758285)

Source: Data Analysis, 2022, values in parentheses is the standard errors

Table 5: Factors hindering fruits consumption

S/N	Challenges	SA	MA	A	D	SD	mean	Std dev	rank
1	Level of income	144(48.0)	113.7)	42(14.0)	101(33.7)	2(0.7)	3.65	1.38	2 nd
2	Price	78(26.0)	14(4.7)	99(33.0)	102(35.7)	2(0.7)	3.20	1.19	9 th
3	Access to fruits	38(12.7)	15(5.0)	70(23.4)	172(57.5)	4(1.3)	2.7	1.05	10 th
4	Individual taste	96(32.0)	37(12.3)	119(39.7)	47915.7)	9(0.3)	3.60	1.10	5 th
5	Consumer awareness	101(33.7)	49(16.3)	81(27.0)	66(22.0)	3(1.0)	3.60	1.19	5 th
6	Quality consciousness	105(35.1)	49(16.4)	71(23.7)	73(24.4)	1(0.3)	3.62	1.20	4 th
7	Household size	99(33.0)	36(12.)	41(13.7)	116(38.7)	8(2.7)	3.34	1.35	8 th
8	Level of education	124(41.3)	32(10.7)	50(16.7)	87(29.0)	7(2.3)	3.60	1.33	5 th
9	Perception	122(40.7)	35(11.7)	74(24.70)	66(22.0)	3(1)	3.69	1.23	1 st
10	Storage facilities	136(45.3)	18(6.0)	61(20.3)	75(25.0)	10(3.3.)	3.65	1.35	2 nd