

Determinants of Non Alcoholic Beverages (NAB) Consumption in North-Western Nigeria: A study of Sokoto Metropolis

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ABSTRACT: Non alcoholic beverages (NAB) consumption in Nigeria has been steadily increasing over the years to the point where nearly half of the populace are consumers of these products. This study seeks to determine the role played by socioeconomic characteristics in driving consumption of some selected NABs particularly juice and carbonated soda in Sokoto metropolis of Nigeria. To adequately capture the variables of interest, specifically, location and ethnicity variables, the metropolis was grouped into four clusters, namely Peri-urban, Sokoto main, G R As, and Resident community. In each of the clusters one hundred households were randomly selected to arrive at a sample size of four hundred households. Descriptive, OLSMR and probit analytical tools were used to analyse the data collected. The results shows that about 59% and 71% of the respondents consumed juice and soda respectively while the per capita consumption of juice was slightly higher than that of soda which were 7.57 and 7.32 litres respectively. Household sizes, education and economic status of the household heads play a significant role in determining the consumption level of both juice and soda. While gender and location significantly affected the respective consumption of juice and soda in the metropolis. In both cases gender and household sizes were negative while the rest were positive. The probit analysis showed that age and household sizes negatively affected the probability of both juice and soda consumption, while education and economic status of the household heads positively determined the probability of consumption of the two beverages in the metropolis. Finally, while gender has a negative effect on the probability of juice consumption, ethnicity of the household heads played a positive role in the consumption probability of soda beverages. The study concluded that an improvement in the consumption of NABs in the metropolis requires policies aimed at encouraging the citizenry to have a smaller family size, sound education and raising their real incomes. While the manufacturers should be encouraged to fortify their carbonated drinks with nutrients.

Keywords: Juice, Soda, Sokoto metropolis, Probit, OLSMR, Consumption

INTRODUCTION

Consumption of non alcoholic beverages (NABs) such as Juice and carbonated drinks has been a basic form of refreshment among Nigerians of all ages, tribes and socioeconomic backgrounds (Phillip *et al.* 2013). NABs have been widely recognized for their various contributions to household food and nutrition in general, and especially, for their role in body hydration (Phillip *et al.* 2013). They noted that fruit and vegetable based juices are important contributors of vitamins, minerals and dietary fibre; and the benefits of juice consumption have been reported (Flake and Nzeka, 2009; Phillip *et al.* 2013) while that of the carbonated soda has been a subject of debate. For example, some authors have reported that consuming even as little as one or two sodas per day is connected to a myriad of pathologies (Valentine, 2001). The most commonly associated health risks are obesity, diabetes and other blood sugar disorders, tooth decay, osteoporosis and bone fractures, nutritional deficiencies, heart disease, food addictions and eating disorders, neurotransmitter

dysfunction from chemical sweeteners, and neurological and adrenal disorders from excessive caffeine (Valentine, 2001).

Demand for fruit juice in Nigeria has grown rapidly over the past decade, rising from an estimated 15 million consumers of fruit juice in 2002, to about 55 million (approximately 37 percent of the population) in 2007 (Flake and Nzeka, 2009). They further noted that even with this growth, Nigeria's per capita consumption of fruit juice remains far below the world average. As for carbonated drinks, annual per-capita consumption of Coca-Cola alone in 2008 was estimated at 27 servings of 8 Oz per capita per year, which is below the world average of 85 servings per capita per year (Wojcicki and Heyman, 2010). However, more Nigerians can now afford to take NABs as part of their menu while many more (even from among the dominant low-income group) are recognizing the nutritional values of juices and are trying to eat healthier (Flake and Nzeka, 2009). Furthermore, they noted that, the trend toward greater

establishment of hotels, restaurants and institutional (HRI) firms are also boosting demand for NABs.

According to economic theory and observed behavior age has a negative effect on consumption and that as the age increases consumption decrease (Ajmair and Akhtar, 2012). Also the sex of the household head has been reported to have an impact on consumption. For example Ruel *et al.* (2005) observed that in the female headed household, a higher priority is placed on child health and nutrition in allocating household resources. The positive relationship between income and consumption of beverages has been widely documented (Adeneye, 1991, Adebayo, 2010). The ethnicity of the consumers plays a very significant role in determining the types and quantities of beverages consumed (Jabbar and Domenico, 1990, Jansen, 1992). While Phillip *et al.* (2013) reported that an increase in the education of the household heads was found to be associated with a significant increase in the budget shares of fruit juice. Melesse and Beyene (2009) found that household size was negatively correlated with consumption levels for some beverages whereas household location was positively correlated with the consumption level and that as the level of urbanization increases beverage consumption also increases (Melesse and Beyene, 2009). With regards to tools of analysis, Sykes (2013) noted that multiple regression analysis is valuable for quantifying the impact of various simultaneous influences upon a single dependent variable. Meanwhile, Pindyck and Rubinfeld (1998) observed that probit is most appropriate where the dependent variable is a binary response, taking on the values zero and one, which indicate whether or not a consumption of a particular NAB has occurred or not.

It is against the above background and in recognition of the potentials of NABs to meeting the household food and nutrient needs that this study was embarked upon to determine the relationships between socioeconomic characteristics such as age, sex, marital status, income, location, educational level of household head, ethnicity, household size and the consumption of juice and soda beverages in Sokoto State in general and Sokoto metropolis in particular. The study aims to provide information to government policy makers for designing nutrition and health policy, as well as to manufacturers, distributors, advertisers and managers in retail outlets in order to design appropriate strategies in pricing,

marketing and product positioning. To achieve this, the following objectives were examined.

- a) Identify the actual consumption level for juice and soda beverages in the metropolis
- b) Determined the factors affecting the consumption of juice and soda in the metropolis.

MATERIALS AND METHODS

Study area

The study area is Sokoto metropolis, which lies between latitude 13° 04'N and longitude 5°14'E and at an altitude of 272 m above sea level. The metropolis is in the dry Sahel surrounded by sandy terrain and isolated hills with an average annual rainfall of 550 mm starting in June and ending September-October. The highest temperatures of 45°C during the hot season are experienced in months of March and April while Harmattan, a dry cold and dusty condition is experienced between the months of November and February (Abdullahi *et al.* 2009). The metropolis is made up of Sokoto North and Sokoto South Local Government Areas (LG As) as well as parts of Bodinga, Dange-Shuni, Kware and Wamakko L G As with an estimated population of about 1,078,092 (NPC, 2012).

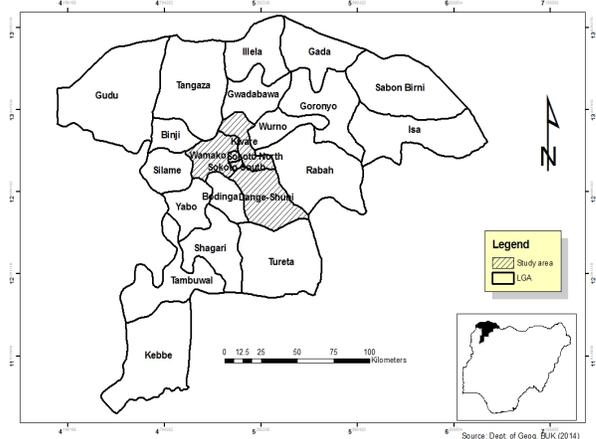


Figure1: Depicting the study area.

The demographic structure of the metropolis is cosmopolitan albeit with *Hausa/Fulanis* predominating, and Hausa is the common language. Also, residents in the metropolis were ethnic groups from within and outside Nigeria, especially *Yorubas, Ibos, Zabarmawa, Nupes, Ebiras, Togolese*. Occupation of the inhabitants includes farming, trading, civil service and a reasonable proportion of the population works in organised private

sectors. The metropolis is the capital city of Sokoto state and displays a classical example of urban primacy as it contains nearly 95 percent of the modern business and commercial ventures in the state.

Sampling procedure and sample size

Krejcie and Morgan (1970) as reported in Sekaran (1992) provide generalized scientific guidelines for sample size decisions. They reported that for a population size from 75,000 to one million a sample size of 384 will be ideal. Therefore, considering that the number of households in the metropolis is estimated to be 201,116 (NPC, 2012) this study used a sample size of four hundred (400) households. Meanwhile two of the key variables of interest namely, Ethnicity and Location may not be adequately captured by straight forward sampling technique. Therefore, following Melesse and Beyene (2009), Sokoto Metropolis was first grouped into four homogeneous clusters, namely Peri-urban, Sokoto main, G R As and Resident community clusters. In each of the cluster, one hundred households were randomly selected.

For the purpose of this study, the clusters are hereby defined as follows:

Peri-urban cluster: Peri-Urban as defined by Mullins *et al.* (1994) is a community outside a town or city/municipal limits in which there is feasible access to the city for a commuting (i.e. Daily) work force and although some households may maintain farms, it is not a farming-based community. Therefore going by this definition, the following towns were classified as peri-urban areas, namely, Dange, Gagi, Kware, Kalambaina, Shuni and Wamakko.

Sokoto main cluster: this is the ancient Sokoto town in which the original inhabitant of the metropolis lives. The area is urban as defined by Mullins *et al.* (1994) whereby it is within the city municipal limits while the majority of households infrequently or never engage in farming activities.

GRAs cluster: these are areas located outside the Sokoto main as well as the institutional housing estate such as University quarters, CBN quarters. It is where the civil servants and the educated elites live.

Resident communities cluster: this is where the people of ethnic origin other than the dominant

Hausa/Fulanis lives most especially the Yorubas, Ibos, Ebiras and other ethnic groups.

Data collection

The primary data for this study was collected by the researcher assisted by trained enumerators from June-August 2013 using a pre-tested structured food frequency questionnaire (FFQ). The information collected included that of socio-demographic cum economic characteristics such as age, sex, marital status, household size, ethnicity, location of households, and educational level of the household head and economic status of household heads. Also collected were information on the types, frequencies and quantities of juice and soda beverages consumed by the households.

Meanwhile, there were four different types of packaging in which juice and soda were sold in the metropolis, namely, Tetra pak, bottles, cans and plastic pets. While Tetra pak and bottles were mainly use for juices and soda packaging respectively, cans and pets were however used for both juice and soda dispensing. Interestingly, most of the respondents reportedly consumed both juice and soda in both cans and pets interchangeably, depending on availability and mood. Thus, it becomes humanly difficult to separately identify the quantity consumed of soda and juice packaged in cans and pets. Consequently, in order to quantify the quantity consumed of juice and soda packaged in cans and pets, the volume consumed in each of the two package types were multiplied by 0.5 and the resultant value added to that of tetra pak juice and bottled soda respectively. In other words half of the volume consumed of both cans and pets was added to the volume of tetra pak juice to find the quantity consumed of juice in the metropolis. Similarly, the quantity consumed of bottled soda was added to half the quantity consumed of both the cans and pets to arrive at the total soda consumption by the respondents.

Method of data analysis

Data collected were analyzed using STATA software, Version 11. Descriptive, OLS and probit analytical tools were used in analyzing the data collected.

Ordinary Least Squares Multiple Regression Model

Ordinary Least Squares Multiple Regression (OLSMR) technique was used to test for the level and significance of the relationship between the dependent variable and the various independent variables of interest in this

study. Two regression analysis were carried out separately, one for juice, the other for soda. The regression model is specified in implicit form as follows:

$$Y = \beta_0 + X_1 \beta_1 + X_2 \beta_2 + X_3 \beta_3 + X_4 \beta_4 + X_5 \beta_5 + X_6 \beta_6 + X_7 \beta_7 + X_8 \beta_8 + U_i \quad (1)$$

Y = consumption level (dependent variables)
 X₁ – X₈ = Independent variables
 β represent a vector of unknown parameters and U represent a random disturbance term
 Where
 Y = Consumption level of juice (in Litres)
 X₁ = Age of household head (in years)
 X₂ = Sex of the household head (dummy variable whereby female =0, male=1.)
 X₃ = Marital status of the household head (whereby single =1, married=2 and widowed/seperated=3)
 X₄ = Household size (Number of persons)
 X₅ = Ethnic origin (dummy variable whereby *Hausa-Fulani* =0, others =1.)
 X₆ = Location (whereby Peri-urban=1 Sokoto main=2, G R As=3 and Resident communities=4)
 X₇ = Educational level of the household head (whereby none=0, Primary=1, Secondary=2, NCE/OND=3, First degree=4, Postgraduate=5)
 X₈ = Economic status of the household heads (whereby <₦50,000=1, ₦50,000-100,000 =2 and >₦100,000 =3)
 U = Error term

Also another regression analysis was carried out for carbonated soda, using the same independent variables.

The Probit Model

Considering that the types and quantities of juice and soda consumed by the respondents during the study period varies between households, it is therefore important to test for the level of relationship or significance between the consumption probability for each of the desegregated individual NABs (as dependent variables) and the socioeconomic variables as defined above (as independent variables). Consequently, a probit analysis was carried out separately for juice and soda.

Therefore, it is hereby assumed that Y* can be specified as follows:

$$y_i^* = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_8 X_8 + \epsilon_i \quad [2]$$

Where,

$$y = \begin{cases} 1 & \text{if } y^* > 0 \\ 0 & \text{otherwise} \end{cases}$$

Where X₁, X₂-----X₈ represent a vector of random variables,
 β represent a vector of unknown parameters and ε represent a random disturbance term.

For this study the model is specified thus:

$$Y_i^* = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \epsilon \quad [3]$$

Where:

- y_i^{*} = Probability of juice consumption by the ith households
- X₁ = Age of household head (in years)
- X₂ = Sex of the household head (dummy variable whereby female =0, male=1)
- X₃ = Marital status of the household head (whereby single=1, married=2 and widowed/seperated=3)
- X₄ = Household size (Number of persons)
- X₅ = Ethnic origin (dummy variable whereby *Hausa-Fulani* =0, others=1.)
- X₆ = Location (whereby Peri-urban=1 Sokoto main=2, G R As=3 and Resident communities=4)
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- X₈ = Economic status of the household heads (whereby <₦50,000=1, ₦50,000-100,000 =2 and >₦100,000 =3)
- ε = Error term
- y = $\begin{cases} 1 & \text{if respondents consume juice} \\ 0 & \text{if respondents do not consume juice} \end{cases}$

Another separate probit analysis was carried out for carbonated soda using the same independent variables.

RESULTS AND DISCUSSIONS

Socio-demographic characteristics

Table 1 shows the socio-demographic characteristics of the respondents which include gender, age, marital status, household sizes, educational and economic status of the household heads. The results show that the average age of the household heads was 38.71 which can be considered as of the middle age bracket. In Nigeria, the dominance of households headed by middle age people have been widely reported (Onyemauwa, 2010, NBS, 2010, Bamidele *et al.*, 2010).

About 67% of the respondents were educated up to the tertiary levels. This should not be surprising as many consumption studies set in metropolitan areas reported similar results. For example, Amao *et al.* (2006) in an urban demand study carried-out in Lagos metropolis as well as Nwachukwu *et al.* (2011) in another consumption study conducted in Owerri metropolis all reported that more than 50% of the respondents have attained their tertiary education. Higher level of education most often translates to higher levels of income (Bamidele *et al.*, 2010). Therefore, considering

that over half of the respondents have attained tertiary education, it is not surprising that over half of the respondents in this study were of average to above average economic status.

Table 1: Showing Socioeconomic characteristics of the respondents.

Characteristics	Frequency	Percentages
Gender		
Male	335	83.75
Female	65	16.25
Total	400	100
Age (years)		
Below 26	38	9.5
26-----35	156	39
36-----45	104	26
46-----55	67	16.75
Above 55	35	8.75
Total	400	100
Mean Age	38.71	
Marital status		
Single	86	21.5
Married	310	77.5
Widowed/Separated	4	1
Total	400	100
Household size		
1-----5	176	44
6-----10	131	32.75
11-----15	58	14.5
16-----20	14	3.5
Above 20	21	5.25
Total	400	100
Mean household size	7.38	
Educational Status		
Not attended	35	8.75
Primary	42	10.5
Secondary	54	13.5
NCE/OND	64	16
Degree/HND	144	36
Postgraduate	61	15.25
Total	400	100
Economic status		
Low	165	41.25
Average	185	46.25
Above average	50	12.5
Total	400	100

Source: Field Survey, 2013

Consumption frequency for juice and soda in the metropolis

The results in Table 2 showed that for the metropolis as a whole, over 71% of the respondents consumed carbonated soda, while nearly 60% of the respondents consumed juice. Location wise however shows that the resident communities had the highest consumption frequency with 87% and 99% consuming juice and soda respectively. The consumption of both juice and soda is about equals in the GRAs with about 78% of the respondents in the GRAs consuming the two products. Table 2 gives the breakdown for the other locations. In a similar consumption study, Kim et al. (2011) also reported significantly higher consumption frequencies for carbonated soda and fruit juice. Wojcicki and Heyman (2010) also reported that there exists a relatively high soda consumption levels in African countries, despite the poor child health outcomes and lower gross national income in the African countries.

Consumption level of the various NABs in the metropolis

The annual per household and per capita consumption for the various locations in the metropolis and for the metropolis as a whole is presented in Table 3. It shows the annual per capita consumption of juice for the metropolis to be 7.57 litres while that of soda is slightly less at 7.32 litres, which is less than 10% of the global average (82.5 litres) and well below the Nigeria's average of 35 litres (Wojcicki and Heyman 2010). This low level of consumption should not be surprising considering that Sokoto state is the most economically backward state in Nigeria (NBS, 2010). Noteworthy is the fact that the consumption levels increases as one moves from the peri-urban areas to the city centre and on to the GRAs and resident communitiess areas. In fact, the consumption level in each of the latter two clusters is more than quadruple that of the peri-urban and Sokoto main clusters, as well as above the average for the metropolis as a whole (Table 3).

This is as expected as the two locations were populated mainly by the highly educated and economically prosperous households. Many authors have reported the positive linkages between the economic status of the household heads and NABs consumption (Adeneye, 1991, Adebayo, 2010). While the positive influence of education on NABs consumption is consistent with findings by Fuller et al.(2004) as well as Phillip et al. (2013).

Table 2: Consumption frequency for Juice and Carbonated soda for the different clusters

Location	Juice		Soda	
	Frequency	Percentage	Frequency	Percentage
Peri-Urban	40	40	62	62
Sokoto main	34	34	48	48
G R As	78	78	77	77
Resident community	87	87	99	99
Total	239	59.75	286	71.5

Source: Field Survey, 2013

Table 3: Consumptions level of Juice and Carbonated soda for the different clusters

Location	Mean annual consumption per household (litres)		Mean annual consumption per capita (litres)	
	Juice	Soda	Juice	Soda
Peri-Urban	18.96	25.69	2.47	3.34
Sokoto main	25.51	17.16	2.44	1.64
G R As	64.19	60.68	9.34	8.83
Resident community	71.89	69.43	16.01	15.46
Average for the metropolis	45.13	43.24	7.57	7.32

Source: Field Survey 2013

Linear regression results

The OLS result for juice and that of carbonated soda shows that the adjusted R^2 to be 0.3922 and 0.3039 respectively. This implies that the independent variables included in the model collectively explained about 39% as well as 30% of the variation in the consumption of juice and carbonated soda in the metropolis. Gujurati (2004) observed that in a study using cross-sectional data involving several observations, one generally obtains low R^2 because of the diversity of the cross-sectional units. The results show that the coefficient for household sizes is negative and significant for both juice and soda beverages at the 5% and 1% levels respectively, implying that as the household size increases there is a corresponding decrease in the consumption of the two NABs. This is as expected as it has been noted by many authors that household size has a significant negative impact on consumption, especially on those non essential food items (Jansen, 1992). Location of households was positively significant at the 1% level for the consumption of soda only. This implies that as one move from rural areas to the city centre and on to the GRAs the consumption of carbonated soda continuously increases. This scenario has been reported severally by many authors (Jansen, 1992; Ruel *et.al.*, 2005; Melesse and Beyene, 2009). Gender of households was negatively significant (at the 5% level), for the consumption of juice. This implies that the female headed households consumed more juice than the

male headed households. This is in agreement with the results of Phillips *et al.* (2013) who reported that the budgetary share of fruit juice tends to be significantly higher among female-headed households than those of their male counterparts. This they noted implies that female headed households are more likely to choose NABs that are rich in vitamins and minerals than their male counterparts.

This they noted implies that female headed households are more likely to choose NABs that are rich in vitamins and minerals than their male counterparts. The educational level as well as the economic status of household heads both positively and significantly affect consumption of juice and carbonated soda in the metropolis. The economic status was significant at the 1% level while the educational level was significant at the 1% level for juice and at the 10% level for carbonated soda. The positive and significant impact of educational level and economic status of household heads to the consumption of juice and carbonated soda conforms to a-priori expectations: theoretically, as the educational level increases, income is expected to increase. While an increase in real income implies an increase in purchasing power of consumers, and is, therefore, expected to lead to increased demand for beverages (Flake and Nzeka, 2009, Melesse and Beyene, 2009, Phillip *et.al.* 2013). However, Fuller *et.al.*(2004) noted that the educational achievements within the household, independently of the additional income it brings has been known to increase the consumption of beverages. Other details are presented in Table 4.

Table 4: OLS results for the determinants of selected juice and carbonated soda consumption in Sokoto metropolis

Variables	Juices		Carbonated Soda	
	Regression Coefficients	Standard errors	Regression Coefficients	Standard errors
Age	16.92446	25.78608	7.180485	23.09715
Gender	-1225.189	544.6128**	-15.37045	487.8215
Marital status	-254.4842	551.4822	-457.6268	493.9746
Household size	-102.8188	45.96349**	-130.2664	41.1705***
Ethnicity	68.48082	457.0159	-199.1796	409.3591
Location	218.8377	248.0582	613.6747	222.1911***
Education	483.655	174.7682***	264.9997	156.5437*
Economic	3280.641	385.9588***	2073.854	345.7117***
Constant	-2602.148	1425.211	-895.569	1276.592
F-value		31.53***		22.77***
Adjusted R ²		0.3922		0.3039

***=P<0.01. **=P<0.05. *=P<0.10

Probit regression results

Gujurati (2004) observed that the conventional measure of goodness of fit, R^2 , is not particularly meaningful in binary regress and models. As such measures similar to R^2 , called pseudo R^2 , are usually used. He noted, however, that in binary regress and models, goodness of fit is of secondary importance. What matters are the expected signs of the regression coefficients and their statistical and/or practical significance. Consequently, the low pseudo R^2 reported in this study should be of little concern considering that the signs and magnitude of the regression coefficients are of the correct types and significance as per *a priori* expectations.

The probit result for both juice and carbonated soda shows age of the household heads to be negatively significant at the 1% level. This implies that the probability of consumption of these two beverages increases with the reduction in the age of household heads.

Gender of households was also negatively significant (at the 1% level), for the consumption of juice. This implies that the probability of consumption of juice is higher in the female headed households than the male headed households. This is in agreement with the results of Phillips et al.(2013) who reported that the budgetary share of fruit juice tends to be significantly higher among female-headed households than those of their male counterparts. This is as expected as it has been noted by many authors that household size has a significant negative impact on consumption, especially on those non essential food items (Jansen, 1992). The

ethnicity variable was positively significant at the 10% level for carbonated soda. This means that the probability of soda consumption increases when households have non *Hausa/Fulanis* as the head. Jabbar and Domenico (1990) as well as Jansen (1992) all underscore the importance of ethnicity variable in the consumption of beverages. They all reported that people of Southern ethnic origin consumed more of the manufactured beverages than people the *Hausa/Fulanis* of Northern Nigeria. The educational level as well as the economic status of household heads where both positive and significant in determining the probability of consumption of juice and soda in the metropolis. While the economic status was significant at the 1% level, that of educational level was significant at the 5% level for juice and at the 10% level for carbonated soda. This is as expected according to economic theory as well as *a-priori* expectations and is in agreement with the results reported by Melesse and Beyene (2009) and that of Phillip *et al.* (2013). Other details are presented in Table 5.

CONCLUSIONS AND RECOMMENDATIONS

It could be concluded that there are myriad importance of juices in supplementing diets. Socioeconomic factors (such age, educational level, occupation, family size and income play an important role in determining the consumption level of the individual households. Based on the findings, it should be encouraged that the citizenry be educated on nutritionally value of NABs. As for carbonated drinks, the consumption of which is subject to controversies, however, if the manufacturers could be persuaded to fortify their carbonated drinks

with nutrients, this will go a long way to counter the arguments that such drinks are nutritionally useless, as

well as to reduce nutrient deficiency among the consumer population.

Table 5: Probit analytical results for juices and carbonated soda consumption in Sokoto metropolis

Variables	Juices		Carbonated Soda	
	Regression Coefficients	Standard errors	Regression Coefficients	Standard errors
Age	-.0339846	.0114631***	-.0324288	.0100432***
Gender	-.7263746	.2639512***	-.1595656	.2258326
Marital status	.2790081	.2252479	-.2900836	.2329635
Household size	-.0372446	.0198097*	-.0070709	.0165461
Ethnicity	.2422242	.2134036	.4017641	.2132723*
Location	.0111173	.1054729	-.0976486	.1046023
Education	.1809997	.0736645**	.1146339	.0652487*
Economic	1.003348	.1775711***	.5594712	.1558977***
Constant	-.4357025	.5656566	1.36876	.5914114*
LR chi ² (8)		216.78***		124.43***
Pseudo R ²		0.4020		0.2529

Note. ***=P<0.01. **=P<0.05. *=P<0.10.

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