FOOD SECURITY STATUS IN NIGERIA: PRE AND POST ECONOMIC DEREGULATION REVIEW

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ABSTRACT

Hitherto, the Nigerian economy was highly regulated. By 1986 however, there was a transition to deregulation as the dominant economic philosophy with far reaching effects on the economy and the well being of the people. This paper reviews the effects of this shift in economic philosophy on one aspect of human well being, namely, food security using trend examination and descriptive methods. The paper submitted that while food supplies improved considerably after deregulation especially in the immediate post deregulation period, the ability of the citizens to access this food deteriorated significantly and the food security position worsened. Appropriate suggestions were consequently offered.

Keywords: *Deregulation, Liberalization, Food Security, Nigeria.*

INTRODUCTION

Since independence in 1960, the Nigerian economy had operated under two major economic philosophies with the turning point being 1986. Prior to 1986, the economy was highly regulated with government taking direct control of the "commanding heights" of the national economy. By the early 1980s, significant distortions were thought to exist in the economy with respect to pricing of tradeable items leading to sub-optimal allocation of resources in the economy. Hence, in 1986 an economic reform programme in the form of a Structural Adjustment Programme (SAP) was embarked upon anchored principally on the deregulation of the economy and liberalization of trade. The targets of these measures were principally the relaxation or abolition of import licensing, tariff structure, price control, foreign exchange control and interest rates control.

Reform processes such as those embarked upon in Nigeria in 1986 usually leads to "a complete re-orientation of the economy" (Olashore, 1991) and this was indeed the case in Nigeria where the deregulatory and liberalization philosophy remains the critical basis of economic policy despite the official abandonment of Structural Adjustment Programme in the 1990s. Spurred by globalization, which itself is essentially deregulation on a global level, the Nigerian economy has since remained anchored on free-trade, market mechanism and private sector orientation, the key instruments of the SAP that channeled in the reform of the economic philosophy underlining the Nigerian economy in 1986.

Although the shift to economic deregulation and trade liberalization affected many sectors of the economy, its impact on the agricultural economy was one of the most acute and remarkable (Adubi, 1996; Ojo, 1994). The key features of agricultural production and the long tradition of governmental regulation of the sector became radically affected by the deregulation and liberalization philosophy with vital consequences for food security.

Following over two decades of deregulatory practices, this paper reviews the effects of this shift in economic philosophy on one aspect of human well being, namely, food security using trend examination and descriptive methods. The paper compares the food security status of the country before and after the adoption of deregulation as the dominant

economic philosophy. It considers the lessons derivable from Nigeria's experience and proffer suggestions in this regard.

ECONOMIC DEREGULATION

Economic deregulation describes the process of the removal of official restrictions on consumer choice, and the introduction or extension of competition on the supply side of the market. The primary aim of such a process, usually, is to reduce or eliminate distortions that are believed to drive a wedge between prices and marginal costs. Economic deregulation is rooted in the neo-classical doctrine of laissez-faire which believes that factors of production, goods and services are optimally priced when their prices are freely determined in a competitive market, implying that resources are best allocated by the market mechanism and the selfish motives of private economic agents. Hence, the main symptom signaling the need for deregulation is the prevalence of supply-demand imbalance in both the factor and product markets, and the basic aim of such deregulation is to eliminate inefficiency in pricing and production decisions (Isijola, 2000; Olashore, 1991). The principle of laissez faire and its derivatives, the deregulation/ liberalization thesis, received greater incentives for wider global spread in the late 1970s/1980s following the critical macro economic problems experienced by many highly regulated economies in Africa, Asia and Latin America, the collapse of socialism as a dominant alternative macro economic framework, and the increased visibility of the principally classical/monetarist dominated Bretton Woods Institutions - the World Bank and the International Monetary Fund (IMF).

Nigeria's real first move towards large scale deregulation of the economy started with SAP in 1986 and this has been subsequently upheld and reinforced by successive regimes, the latest being the National Economic Empowerment and Development Strategy (NEEDS) introduced in 2003 following the return to democratic rule in 1999. With specific reference to agriculture, the objectives of SAP was the achievement of significant and sustained increase in production to meet domestic food and raw material needs and reduce the degree of dependence on food imports; achieve sustained increase in the production of export crops so as to diversify the production base of the economy, raise rural income and employment, achieve

minimal inflationary growth and improve regional balance in crop production (Adubi, 1996; Ojo, 1994). The specific policy instruments that were used included: abolition of commodity/ marketing boards, removal of subsidies on agricultural inputs such as fertilizers, reform of tariffs on the imports of agricultural inputs including tractors, liberalization of agricultural exports, and privatization of agro based enterprises, foreign exchange liberalization and interest rate deregulation (Adebayo, 2002; Famoriyo, 1998; Ukpong and Iniodu, 1994).

FOOD SECURITY

The idea of food security was presented for the first time at the World Food Conference in 1974 viewed solely from the perspective of having adequate availability of food on a national scale. Today, it is a condition in which all people have access at all times to enough food of an adequate nutritional quality for a healthy and active life (World Bank, 1986 as cited in Tollens, 2000). There are four dimensions to this: (i) availability of sufficient amount of food which is a function of food production (ii) stability of supply over time which depends on the ability to preserve/store produced food and supplement available food through imports if necessary (iii) access to the available food which depends on income levels and its distribution and (iv) food utilization which encompasses procurement, ingestion and digestion all of which are dependent on nutritional quality, education and health (Tollens, 2000).

Food security exists at both the macro and micro levels. National Food Security (NFS), the macro dimension, is possession by a nation of the capacity to procure enough food through production or imports to feed its population. This is a necessary condition but not a sufficient condition for Household Food Security and Individual Food Security since food availability on a national scale does not preclude the lack of adequate access to such food by many of the inhabitants due to weak markets, poor infrastructure and information system, and inequality in resource and income distribution. Various composite indices have since been developed to measure Food Security incorporating all the dimensions of food security. Popular among these are the Aggregate Household Food Security Index (AHFSI) by the United Nation's Food and Agricultural Organisation (FAO) and the Food Security

Index (FSI) of the United States Agency for International Development (USAID)

DETERMINANTS OF FOOD SECURITY STATUS IN NIGERIA

Experts have argued that significant food and nutrition problems exist in Nigeria (Okuneye 2002, 2000; Famoriyo, 1998; Olayide, 1982). The basic aim of deregulatory policy measures in the food sub-sector was to correct this problem. Olayide (1982) conceived the food and nutrition problem in terms of food supply and demand imbalance. Factors that constrain food supply and food demand invariably affect food security. On the supply side major factors hampering the supply of food in Nigeria are ownership of productive assets and resources which are biased against agricultural producers, nature of farm organization and technology which are crude and undeveloped, and the lack/primitive state of marketing infrastructures and mechanisms, all of which influence food output and availability. The demand for food is affected by poor growth rate/distributional structure of income, high food prices, preference structure which is largely in favour of foreign products, and various socio-cultural factors relating to poor state of nutrition education, intra household food distribution decisions, poor cooking technologies and low access to adequate health care (Tollens, 2000; Famoriyo, 1998; Norton and Alwang, 1993; Olayide, 1982)

POLICY - FOOD SECURITY INTERFACE

The point of intersection between macro economic policy and food security lies in the direct and indirect impact of policy (both economy-wide policies and sector-specific policies) on food availability/supply stability, factor incomes and price level, and thus, on access to food, and on social and cultural factors (such as education and health) that affect food utilization.

THE ANALYTICS OF THE NIGERIAN SITUATION

Given the above literature, this paper assesses the effect of deregulatory policies on food security in Nigeria by examining and comparing the trend, over time, in various proxies of food security. The main proxies of food security status used are food production and food import as indicators of food availability, food prices and GNP per capita as indicators of food access, and per caput calorie intake as indicator of food utilization. Dauda

(2006) has demonstrated that most of these proxies adequately explain food security status of the country.

Food Production: It is generally agreed that food production in Nigeria was at an adequate level for most periods and that the liberalization of the economy had a positive impact on food production (Phillips 2002; Idachaba, 2000). There were considerable gains in aggregate and per caput indices of agricultural and food production following the deregulation of the economy (Table 1) and virtually all major food items in the country recorded positive trends in output for the periods 1980-89 and 1990-98 with the rate of change in production being significantly higher for the post-SAP era.

The aggregate index which was on a decline prior to the deregulation of the economy improved thereafter, the 1995 value being doubles that of 1985. While negative growth was recorded in nearly all the subsectors of agriculture for the period preceding deregulation, the period immediately after the deregulation of the economy recorded very high rate of growth in agricultural output with most of this being in the staples subsection. The rate of growth however dropped after the immediate period following deregulation although it still remained positive.

That the deregulation of the economy had positive impact on food production is further confirmed by Table 2 above showing the Index of food production in Nigeria. The table shows that from an index of 91 and 97 respectively in 1985, the aggregate and per caput food production index increased to 147 and 123 respectively in 1995. This shows that food production increased considerably after the deregulation policy.

Apart from domestic production, the other major source of food supplies is through importation. Despite increases in food production, Nigeria has had to rely on huge food importation largely because of relatively sluggish growth in per caput food production vis-a-vis population growth and high post-harvest losses which created gap between actual food production and quantity available for supply. Nigeria is a net importer of food and the food import bill as a proportion of total import has maintained an upward swing despite government's restrictive agricultural trade policy (Table 3).

As Table 3 shows, the mean ratio of food import to total import between 1980 and 1985 was 16.7%. Between 1986 and 1993, the period

during which active deregulation was pursued, food import as a ratio of total import was a mere 7.7% confirming that demand was being met by increases in production rather than import. The table also shows, however, that the food import ratio has been increasing in recent times. The foregoing confirms the generally held thesis that food is adequately available in Nigeria to meet the food security needs of the people. However, the increasing reliance on food imports is neither desirable nor sustainable and could constitute a source of insecurity at some points in the future as secure food availability over the long run derives primarily from self sufficiency in production.

Food Prices and Household Income: One of the main thrusts of the macroeconomic deregulation programme in Nigeria was the radical adjustment of agricultural pricing policy. The fixing of commodity prices through commodity boards was dropped and agricultural produce prices became determined by market forces. This along with rapid inflation resulting from the massive devaluation of the Naira had the immediate impact of huge increase in nominal prices of agricultural and food products even though increase in real prices was much less (Adubi, 1996).

As presented on table 4, food prices have been growing in Nigeria since the 1970s, however the rate of growth in prices became much more pronounced from the late 1980s when the nation's economy became deregulated. The Food Price Index in 1995 was about 2000% of the 1985 price, a period of just about 9 years and the 2005 Food Price Index was almost 7000% of the 1985 price. Rising food prices, ceteris paribus, implies that consumers' ability to access available food supplies will be reduced unless greater increases are recorded in income and/or income is redistributed in favour of the poor. Table 5 shows the GDP Per Capita of Nigeria between 1981 and 2003. The table shows that there was progressive decline in the GDP per capita over time but this became remarkable after the deregulation policy. The per capita GDP range was $1061.33 - $1245.44 for the period 1981 - 1985 while it was $334.27 - $462.46 for the deregulation period. The mean per capita income for the period 1986 -1993 (the period of active deregulation) was a mere 29% of the per capita income for the preceding period 1981 -1985.

Accepting Anyiwe (1994) assertion that there was no change in income

distribution (which remains biased in favour of the rich) during the period in question, what tables 5 and 6 show is that people's ability to access food was severely constrained by the deregulation policy.

Food Utilization: Food security implies access to and ingestion of adequate amount of good quality food (Tollens, 2000). Adequacy of food intake is generally considered in terms of some minimal recommended level of food (usually energy intake but also protein, fat and the micronutrients) per caput per period. Table 6 below shows the nutritional indices of food consumption in Nigeria for selected periods between 1970 - 1996. Two important deductions are inherent from Table 6. The first is that the food consumption status of Nigerians which was on the decline since the 1970 was positively affected by the deregulation of the economy in the immediate deregulation period. Per caput calorie intake improved, from 1680.4 kcal just before deregulation, to 2023.6 in the 1985-89 periods before declining to 1955.5 in the 1995-96 periods. The second deduction is that despite the improvements recorded in food consumption after deregulation, the nutritional status of Nigerians remains poor even after deregulation. In relation to daily minimum requirement, deficits were recorded in food consumption throughout the whole of the period under review. The nutritional problems facing Nigerians was recently captured in a national survey on food security (FOS, 2003). The study revealed that 42%, 9% and 25% of children under - five years old were stunted, wasted and underweight respectively. In addition, 9% of the total population and 11.6% of women of child bearing age suffer from under-nutrition.

CONCLUSION AND RECOMMENDATIONS

This paper reviews the food security situation in Nigeria before and after the shift in the economic philosophy underlying economic activities from that of high regulation to that of high deregulation. The paper submitted that while food supplies improved considerably after deregulation especially in the immediate post deregulation period, food accessibility and utilization worsened and overall food security status of the populace worsened. This conclusion aligns with those of other authors such as Dauda (2006) and Okunneye (2002) as a pointer to the fact that concerted efforts need to be

made to halt further deterioration in the food security situation since, the economy is still managed based on the neo-liberal philosophy of laissez-faire that forms the basis of economic deregulation. However, since the poor state of food security emanates mainly from poor access to food, there is the need to implement policies that are capable of raising the income of the low-income group, thereby empowering them to access available food supplies. The policy measures that are required for this can come in various forms such as increasing the earning capacity of the poor through the adoption of pro-poor growth policies in which only those growth enhancing projects that have significant poverty reduction impacts, for example, through their employment creating effects are implemented, or the use of compensation programmes in nutrition (for example, free school meals), subsidized health care for women and children etc.

To eliminate the increasing reliance on food import, it is essential that productivity enhancing measures be implemented in the agricultural sector such that food production can expand at a rate that is commensurate with food deficit. This will involve improving the state of social and economic infrastructures in the rural areas, improving the agricultural extension system which has almost become moribund, encouraging the involvement of the organized private sector in agricultural production especially large scale commercial farming and strengthening the vocational agricultural education system among others. Efforts must be made to halt the galloping increase in food prices. Since this is often a reflection of high cost of production and a non conducive distribution environment, farm and marketing institutions and infrastructures must be strengthened to improve their effectiveness.

There is also the need to ensure that macroeconomic reform measures are implemented within the context of the protection of the basic needs and rights of the citizenry. This is imperative given that studies have more or less confirmed that the Structural Adjustment Programme and its utter neglect of social insurance and safety nets was the single most important contributor to high incidence of poverty, and hence, food insecurity in Nigeria.

Table 1: Indices of Agricultural Production and its Growth Rate in Nigeria, Selected Years, 1970-2005, (1990 = 100).

Period	Aggregate Index	Crops	Staples	Livestock	Fishery
	Pre-Deregulation Period				
1970	75.2	80.3	90.6	47.8	131.3
1975	62.3	62.1	64.6	47.5	164.1
1980	55.2	51.1	45.4	47.8	198.2
1985	62.4	57.5	54.5	66.4	80.5
	Deregulation Period				
1990	100.0	100.0	100.0	100.0	100.0
1995	128.5	141.9	150.6	141.0	100.3
2000	149.2	171.0	178.5	157.2	146.0
2005	161.1	180.3	199.7	250.0	182.1
	Growth Rates of Agricultural Production				
1970-1985	-0.6	-1.6	-2.4	2.4	-2.0
1986-1993	8.8	11.3	12.8	6.1	1.3
1990-2000	3.3	3.9	n.a.	1.8	2.8

Sources:

(i) CBN (2005)-Indices of Agricultural Production.

(ii) Phillips (2000)-Growth rates for 1970-1985 and 1986-1993.

(iii) Fashola (2005) - Growth rates for 1990 - 2000.

Table 2: Nigeria - Indices of Food Production, Selected Years, 1980 - 1995 (1986 - 88 = 100)

Year	Indices of Food Production	
	Total	Per Caput
	Pre Deregulation Period	
1980	78	76
1985	91	97
	Deregulation Period	
1990	126	115
1995	147	123

Source: African Development Indicators, 1996

Table 3: Nigeria - Food Imports Bill, Selected Years, 1971-2000.

Year	Amount (N' m)		
	Total Imports	Food Imports	Food as % of Total
Pre Deregulation Period			
1971	1,098.0	103.2	9.4
1980	9,095.6	1,437.5	15.8
1981	12,839.6	1819.6	14.2
1982	10,770.5	1,642.3	15.3
1983	8,903.7	1,761.1	19.8
1984	7,178.3	1,349.7	18.8
1985	7,062.6	1,199.0	17.0
Mean (1980 - 1985)	9,308.4	1,534.9	16.5
Immediate Deregulation Period			
1986	5,983.6	801.9	13.4
1987	17,861.7	1,873.8	10.5
1988	21,445.7	1,891.6	8.8
1989	30,860.2	2,108.9	6.8
1990	45,717.9	3,474.5	7.6
1991	89,020.2	3,045.7	3.5
1992	143,911.4	12,840.2	8.8
1993	166,100.4	13,952.4	8.4
Mean (1986 -1993)	65,112.6	4,998.6	7.7
Latter Deregulation Period			
1994	162,788.8	13,836.7	8.5
1995	755,127.7	88,349.9	11.7
1996	562,626.6	75,954.6	13.5
1997	845,716.7	100,640.3	11.9
1998	837,418.9	102,165.1	12.2
1999	862,525.3	103,489.8	12.0
2000	962,970.0	113,630.5	11.8
Mean (1994 -2000)	712,739.0	85,438.1	12.0

Sources: Compiled/Computed from CBN (2004, 1998)

Table 4: Trend in Food Prices in Nigeria, Selected Years (1970-2005. (1985 = 100)

Year	Food items	Consumer Price Index Composite
	Pre Deregulation	
1970	9.0	10.8
1980	40.1	42.3
1981	50.2	51.2
1982	54.6	55.1
1983	67.3	67.9
1984	96.2	94.8
1985	100.0	100.0
	Immediate Deregulation	
1986	100.1	105.4
1987	108.7	116.1
1988	195.3	181.2
1989	298.1	272.7
1990	308.1	293.2
1991	345.9	330.9
1992	506.8	478.4
1993	800.2	751.9
1994	1174.6	1180.7
	Latter Deregulation	
1995	2017.7	2040.4
1996	2646.7	2638.1
2000	3213.8	3590.5
2001	4031.1	4268.0
2002	4497.1	4897.0
2003	4832.7	5493.3
2004	5595.3	6347.8
2005	6819.9	7464.9

Source: CBN, 2005

Table 5: Nigeria - GDP Per Capita at 1984 Current Prices (US$)

Year	GDP Per Capita
Pre Deregulation Period	
1981	1245.44
1982	1125.27
1983	1108.44
1984	1129.63
1985	1061.33
Mean (1981 - 1985)	1,134.02
Immediate Deregulation Period	
1986	462.46
1987	340.66
1988	384.64
1989	354.62
1990	394.15
1991	363.33
1992	344.17
1993	334.27
Mean (1986 - 1993)	327.29
Latter Deregulation Period	
1995	242.12
2000	418.99
2003	384.71

Source: CBN, 2008

Table 6: Indices of Food Consumption in Nigeria (Calorie Intake), Selected Periods 1970-1996

Period	Per Capita Calorie Intake	Intake as % of minimum Reqt.
1970-74	1896.0	84. 27
1975-79	1761.0	78. 27
1980 -84	1680.4	74. 68
1985 - 89	2023.6	89. 94
1990-92	2200.0	97.78
1995-96	1955.5	86. 91

N.B: Recommended average daily requirement of intake of calorie = 2250 Kcal/caput

Sources: Compiled/Computed from: (i). Abayomi, Y. O. (1997) (ii). CBN (2008).

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CONSUMPTION OF FRUITS IN BOWEN UNIVERSITY IWO OSUN STATE, NIGERIA: STUDENTS' ECONOMIC ANALYSIS

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ABSTRACT

This study was conducted to determine the socio-economic status of students of Bowen University, Iwo, and their proportion of income spent on both fresh and processed fruits. Also, determine the level of acceptability and the factors affecting the consumption of both fresh and processed fruits. Stratified random sampling technique was employed to select sixty students from the three faculties of the University for the Study. The instrument for data collection was structured questionnaire. The result shows that most of the respondents were dependent. 9.73% of the amount spent monthly on food was spent on both types of fruits. Students' sex and monthly income also affect the consumption of both fruits. Preference though carries a wrong sign, yet has effect on the consumption of fresh fruit having a significant t-ratio. It was recommended among others that awareness must be made to students and the general public on the nutritional importance of the consumption of fruits both fresh and processed through enlightenment campaigns, and other mass media.

Keywords: *Economic analysis, consumption, fresh fruit, processed fruit.*

INTRODUCTION

In West Africa we lack adequate food that is rich in nutrients needed by man for health and reproductive life. The word fruit can be defined as a ripened ovary of a plant containing the seed (Srivastava, 2007). A fruit which is among the perishable commodities is an important ingredient in the human dietaries. Due to its high nutritive value, it makes a significant nutritional contribution to human well being. Most fruits contain significant quantities of sugars and are high in vitamins such as vitamin A and C which are not abundant in the staple food of many tropical areas. Fruits have been significantly singled out in human nutrition for the supply of minerals and vitamins, some hormone precursors in addition to protein and energy (Taylor 1999). Processing is the activity that changes the basic food product form, mainly by reducing the water content in other to achieve increased shelf life and add value and variety to meet greater and wider acceptability.

The fruit processing industries aims at making fruit product available for human consumption all through the year. It is also meant to bridge the gap by using excess supply during its season as raw material and thus ensuring fruit availability during the off season in processed form. Processing may include canning, drying, extraction and bottling of juices. Examples of processed fruit include jams, wine and juices, marmalades, plantain chips, puree, ketchup etc. Some notable processing industries in Nigeria include: Funman Agricultural Product Limited, Quality Foods Monatan, National Institute of Horticultural Research and Training (NIHORT) etc.

The importance, nutritional and dietary value of fruits is enormous. Fruits contain valuable complements to diet such as protein, calcium, iron and vitamin. Nutritionally, fruits provide dietary fluids and fibre necessary for digestion and are essential for maintaining health and provide cure for nutritional disorders. Fruits have contributed to the development of the food drink industries as the serve as raw materials and thus creating employment for people that work in such industries. Fruits add variety, enjoyment and a sense of satisfaction with the diet because of their appealing colours, flavours and textures. Fruits also have great potentials for foreign exchange earnings.

Despite the relatively low caloric values of tropical and subtropical fruits (banana and plantain and avocado are the notable exceptions), they

play an important role in human diet mainly because of their high and diverse vitamin and mineral content. They have become an important part of the diet of people in the developed countries of the world, especially among the health and fitness conscious. In a properly balanced diet, tropical and subtropical fruits may be an excellent component for the sports-oriented person. Nutritionally fruits provide dietary fluids and fibres necessary for digestion and are essential for maintaining health and curing nutritional disorders (Martin, 1979)).

The consuming units (household and individuals) are confronted with a range of commodities with corresponding ranges of prices. Bulk of the fruits consumed comes from the wild, homestead garden and traditional cropping systems. Fruits such as citrus, mango, guava, pawpaw, banana etc. are most time encountered as intercrops in the plantation. However with the increasing awareness on health and nutritional potential of fruit and encouragement of agro-allied industries by Federal Government of Nigeria, people now consume fruits better than before whether in processed or raw form. Various fruits are eaten mainly in areas of production depending on availability and status of the people who can afford them. It was noted that processed fruit product are mainly consumed by the elite and upper class of the society (Babalola, 1996).

Therefore, securing an adequate food supply has been the fundamental concern of mankind over the millennia, and even in today's modern world of great scientific and technological achievements, diets are inadequate for about five hundred million people. In the community of nations concern is increasingly focused on fulfilling the basic needs of all people, and the need for food is a dominant one. Without ensuring satisfactory diets, people cannot live healthy and productive lives. The world is faced with the problem of food shortage. Obiefunna and Lemechi (2001) reported that majority of the people in West Africa lack adequate food that are rich in nutrients needed by man for health and reproductive life. Increased productivity, marketing and consumption of horticultural crops, including fruits was recommended for increased productivity of people leading to economic growth and development. This confirms that fruits are highly suitable for dietary diversification as opposed on focusing mainly on few staple foods available

in each locality. Based on the above, the study sets to determine the socio-economic status of respondents; determine the proportion of students' income spent on both fresh and processed fruits, determine the level of acceptability of processed fruit by respondents, and the factors affecting the consumption of both fresh and processed fruits.

RESEARCH METHODOLOGY

The study was carried out in Bowen University Iwo, Osun State, Nigeria. 60 students were examined with the use of structured questionnaire. Structured questionnaire containing open and close ended questions were used in gathering primary data. Stratified random sampling was employed in the collection of data, 20 questionnaires each were administered to students in the faculties of Agriculture, Social and Management Sciences, and Science and Science Education. However, some of the respondents were not able to state their income since it varied in certain months, and records of how such were spent were not kept. Also, some of the questionnaires were misplaced by the respondents. Analyses of the data obtained from the questionnaire were done through the use of frequency tables and regression analysis to derive the relationship between the dependent and independent variable. Regression models were used to identify the various factors affecting the consumption of fresh, processed, and both type of fruits. Three different regressions were run using the same socio-economic variables.

Dependent variables:

C_F - consumption of fresh fruit/ month

C_{F1} - consumption of processed fruit/month

C_{F2} - consumption of both fruit/month

Independent variables:

X_1 - faculty of respondent

X_2 - sex of respondent

X_3 - preference

X_4 - monthly savings of respondent

X_5 - monthly food expenditure

X_6 - monthly income of respondents

The chosen lead equation for the three regressions ran was based on fairly high explanatory power of R^2, least standard error, and significant t- values.

RESULTS AND DISCUSSION

The background information on the nature of consumption of fruits (fresh, processed, and/or both) and expenditure pattern and distribution of respondents according to their faculties, sex, marital status, religion, source of income, monthly income, monthly food expenditure, savings, and preference. Also the results of the regression analysis are discussed.

Table 2 shows that data were collected from the three faculties of Science and Science Education, Social and Management Sciences, and Agriculture. This implies that students from the various faculties of Bowen University consume both fresh and processed fruit. Table 2 also shows that 38.9% were male students while 61.1% were female student implying that there is no sex discrimination in this study. Both male and female students of Bowen University consume both fresh and processed fruit. Furthermore, table 2 shows that 92.6% of the students were single while 7.4% were married implying that both married and singles consume fruit. And that 90.6% of the respondents were Christians while 9.3% of the students are Muslims which implies that both religions were not against fruit consumption.

Table 3 shows that most of the respondents are dependent on their parent for their monthly income and a little percentage got additional income from uncles, auntie's etc. Income of students affects the consumption of any good and services. The monthly income of a student will determine the quantity of goods and services he or she can consume. The percentage that is spent on consumption will in turn determine the amount that is spent on fruit consumption. The minimum income earned was N5,000, while the maximum income is N 20000. Most of the students earned between N11,000- N16,000 as their monthly income. The mean of the total income earned was N15,277.78. It was observed from the data collected that as income increases students tend to spend more on processed fruit and less on fresh fruit.

Table 5 shows the variation in the monthly food expenditure amongst students. The minimum amount spent on food was N5,000 and the maximum N10,000. The mean of the total monthly food expenditure was N9,037.04.

This implies that students who earn less than N5,000 will spend most of their income on food and spend less on fruit consumption. Table 6 shows that 55.6% of the respondents saved while 44.4% of the respondents spent all their income on consumable and non-consumable goods and services. The total mean of monthly savings is N2,296.30. Table 7 indicates that out of N15,277.78 averagely earned by studentsa certain proportion of it was spent on fresh, processed, and both type of fruits respectively. Table 8 reveals the preference for fresh and or processed fruit, which shows that 40.7% of the respondents prefer fresh fruit and 26% of the respondents do not have any preference between fresh and processed fruit.

The result on table 9 reveals that all the explanatory variables jointly explain 20% of the total variation on the consumption of fresh fruit by students of Bowen University. The result also reveals that the monthly income of respondent is a significant determinant of the amount spent on the consumption of fresh fruit. Preference though carries a wrong sign but yet still have effect on the consumption of fresh fruit having a significant t-ratio. However the result shows that the consumption of fresh fruit in Bowen University is a direct function of student's monthly income.

From the results of this study, it can be deduced that all the explanatory variables explain 23% of the total variation in the consumption of processed fruit by Bowen University student. It also shows that the monthly income of students and preference were the significant determinant of the amount spent on processed fruit. This implies that the monthly income of students is the major determinant in processed fruit consumption as well as the preference for it. Faculty, sex, and food expenditure are not significant, which do not allow for decrease in the amount spent on processed fruit monthly. However, the result reveals that the consumption of processed fruit by Bowen University student is a direct function of their monthly income as well as their preference for it. The results on table 11 reveal that all the explanatory variables explains 30% of the total variability on the consumption both fruit by Bowen University students. It further reveals that sex, student's monthly income and preference affect the consumption of both fruits. However, the result reveals that the consumption of both fruits by Bowen University student is a direct function of their monthly income.

CONCLUSION AND RECOMMENDATIONS

The consumption of fruits is still relatively low and this may be due to high prices of fruit product, season, income and taste. The result gotten from the study reveals that consumption of fruits is greatly dependent on the student's monthly income and it increase with an increase in the level of student's monthly income. The result of the analysis carried out revealed that consumption of fruit either in fresh or processed form is greatly dependent on student's level of income and as well preference. Sex, faculty of respondents, and monthly food expenditure does not in any way affect fruit consumption.

However an increase in student's income will result in a corresponding increase in the level of fruit consumption. The result gotten from the analysis also implies that out of N15277.78 averagely earned by students 4%, 5.73%, and 9.73% of it was spent on fresh, processed, and both type of fruits respectively. Awareness must be made to students and the general public on the nutritional importance of the consumption of fresh and processed fruits through enlightenment, campaigns, electronic media, etc. as they may serve as supplements to some of the nutrient deficiency in our staple foods.

Table 2: Faculty distribution of respondents

Faculty	**Frequency**	**Percentage**
SSE	16	29.6
SMS	19	35.2
AGRIC	19	35.2
Total	***54***	***100***
Sex		
Male	21	38.9
Female	33	61.1
Total	***54***	***100***
Marital status		
Single	50	92.6
Married	4	7.4
Total	***54***	***100***
Religion		
Christianity	49	90.7
Islam	5	9.3
Total	***54***	***100***

Source: Field survey, October 2008

Table 3: Distribution of respondents by their source of income

Source of income	Frequency	Percentage
Parents	49	90.7
Others	5	9.3
Total	54	100

Source: Field survey, October 2008.

Table 4: Distribution of respondents by monthly income

Monthly income	Frequency	Percentage
< 5000	7	12.96
5000-10000	9	16.67
11000-16000	19	35.19
17000-21000	12	22.22
> 21000	7	12.96
Total	54	100

Source: Field survey, October 2008.

Table 5: Distribution of respondents by their monthly food expenditure (N)

Monthly food expenditure	Frequency	Percentage
> 5000	8	14.8
5000-10000	32	59.3
11000-16000	14	25.9
Total	54	100

Source: Field survey, October 2008.

Table 6: Distribution of respondents by their monthly savings

Monthly savings (N)	Frequency	Percentage
< 2000	2	3.7
2000-3500	12	22.2
4000-5500	11	20.4
>5500	5	9.3
No savings	24	44.4
Total	54	100

Source: Field survey, October 2008.

Table 1: Dietary value of tropical fruits

Fruits	Calories	Protein (g)	Calcium (mg)	Fe	Vitamin A (IU)	Thiamine (mg)	Vitamin C (mg)
Orange	53	0.8	22	0.5	-	0.05	40
Banana	116	1.0	7	0.5	100	0.05	10
Mango	63	0.5	10	0.5	600	0.03	30
Pineapple	57	0.4	20	0.5	100	0.08	30
Avocado	165	1.5	10	0.1	200	0.07	15
Guava	58	1	15	1	200	0.05	200
Pawpaw	39	0.6	20	0.5	1000	0.03	50
Cashew nut	550	20	50	0.5	1000	0.03	50

Source: Platt B.S (1992), Tables of representatives values of food commonly used in tropical countries.

Table 7: Proportion of income spent on fresh, processed, and both fruit

Type of fruit	Average monthly expenditure(N)
Fresh	611.87
Processed	875.56
Both	1487.23

Source: Field survey, October 2008.

$$\text{Average income} = \frac{\text{N82,500.00}}{54} = \text{N } 15277.78$$

Proportion of average monthly income spent on fresh fruit

$$\frac{\text{N611.67}}{\text{N15277.78}} \times 100 = 4\%$$

Proportion of average monthly income spent on processed fruit

$$\frac{\text{N875.56}}{\text{N15277.78}} \times 100 = 5.73\%$$

Proportion of average monthly income spent on both fruit

$$\frac{\text{N1487.23}}{\text{N15277.78}} \times 100 = 9.73\%$$

Table 8: Distribution of respondents by preference

Preference	Frequency	Percentage
Fresh	22	40.7
Processed	18	33.3
No preference	14	26
Total	54	100

Source: Field survey, October 2008.

Table 9: Regression analysis for fresh fruit

The double log function was chosen as the lead equation

Variables	Coefficient	Standard error	t-ratio
Constant-X_1	1267.183064	1024.4837	1.237
Sex-X_2	127.5616907	90.460320	1.410
LNP-X_3	-180.3014389	88.684399	-2.033
LNAIS-X_4	-161.2709819	115.88417	-1.392
LNTASFM-X_5	11.84380376	119.10805	.9212
LNMIV- X_6	.1845765190	.91825108	2.010

Source: Field survey, October 2008

$R^2 = 0.20$, F-value = 2.46; *- significant at 5%, **- significant at 10%

$$\mathbf{LNC_F} = 1267.183064X_1 + 127.5616907X_2 - 180.3014389LNX_3 - 161.2709819LNX_4 + 11.84380376LNX_5 + .1845765190LNX_6$$

Table 10: Regression analysis for processed fruit

The semi-log function was the chosen lead equation:

Variables	Coefficient	Standard error	t-ratio
Constant-X_1	-3200.828259	3217.4720	-.995
Sex- X_2	377.8990566	284.09778	1.330
LNP- X_3	618.1134864	278.52036	2.219
LNAIS- X_4	310.1911913	363.94340	.852
LNTASFM-X_5	47.94316464	374.06825	.139
LNMIV- X_6	.4832366361	.28838400	1.676

Source: Field survey, October 2008.

$R^2 = 0.23$, F-value = 2.91; *- significant at 5%, **- significant at 10%

$$\mathbf{C_{F1}} = -3200.828254X_1 + 377.8990566X_2 + 618.1134864LNX_3 + 310.1911913LNX_4 + 47.94316464LNX_5 + 0.4832366361LNX_6$$

Table 11: Regression analysis for both fruits

The double log function was chosen as the lead equation.

Variables	Coefficient	Standard error	T - ratio
Constant-X_1	861.3488291	808.85171	1.065
Sex- X_2	187.1400906	71.420350	2.620
LNP- X_3	-164.9758428	70.018222	-2.356
LNAIS-X_4	-110.7387180	91.493025	-1.210
LNTASFM-X_5	-.8550142941	94.038345	-0.009
LNMIV-X_6	0.2455901668	0.72497879	3.388

Source: Field survey, October 2008.

R2 - 0.30, F - Value - 4.84; *- significant at 5%, **- significant at 10%

$$LNC_{F2} = 861.3488291X_1 + 187.1400906X_2 - 164.9758428LNX_3 - 110.7387180LNX_4 - 0.8550142941LNX_5 + 0.2455901668LNX_6$$

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