

Article

Economic analysis of consumption of fresh and processed fruit in Bowen University Iwo, Osun State, Nigeria

Ayandiji Adebamiji and Omotoso Omotola

Department of Agricultural Economics and Extension, Bowen University, Iwo, Osun State, Nigeria.

Accepted 20 May, 2009

Increased productivity, marketing and consumption of fruits was recommended, but in west Africa we lack adequate food that is rich in nutrients needed by man for health and reproductive life. This study aim at determining the socio-economic characteristics of respondents and the proportion of students' income spent on both fresh and processed fruits. Also the level of acceptability of processed fruit by respondents and determine the factors affecting the consumption of both fresh and processed fruits. The study was carried out in Bowen University Iwo, Osun State, Nigeria. 60 students were examined with the use of structured questionnaire. The result shows that 38.9% were male, 92.6% were single and most of the respondents were dependent. The minimum amount spent on food was ₦ 5000 and the maximum ₦ 10000. 44.4% was spent on consumeable and non-consumeable goods and services. 4%, 5.73%, and 9.73% of it was spent on fresh, processed and both type of fruits respectively. Sex, student's monthly income and preference affect the consumption of both fruits and preference though carries a wrong sign but yet still have effect on the consumption of fresh fruit having a significant t-ratio. However an increase in student's income will result in a corresponding increase in the level of fruit consumption.

Key words: Economic analysis, consumption, fresh fruit, processed fruit.

INTRODUCTION

The word fruit can be defined as a ripened ovary of a plant containing the seed (Srvastava, 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 e.t.c. Some notable processing industry in Nigeria include Funman Agricultural Product limited, Quality Foods Monatan, National Institute of Horticultural Research and Training (NIHORT), etc.

Importance of fruits

- i) Fruits contain valuable complements to diet such as protein, calcium, iron and vitamin.
- ii.) Nutritionally, fruits provide dietary fluids and fibre necessary for digestion and are essential for maintaining health and provide cure for nutritional disorders. (FAO,

*Corresponding author. E-mail: banji22aug@yahoo.com.

Table 1. Dietary value of 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

1997)

iii.) Fruits have contributed to the development of the food drink industries as they serve as raw materials and thus creating employment for people that work in such industries.

iv.) 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.

Nutritional and dietary value

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 (Williams 1985; FAO, 1997) (Table 1).

Consumption pattern of fruit

The consuming unit that is, 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 e.t.c 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, peo-

ple 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 by Babalola (1996) that processed fruit products are mainly consumed by the elite and upper class of the society.

Problem of the statement

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 500 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 to focusing mainly on few staple foods available in each locality.

Objectives of the study

- i.) To determine the socio-economic characteristics of respondents.
- ii.) To determine the proportion of students' income spent on both fresh and processed fruits.
- iii.) To determine the level of acceptability of processed fruit by respondents.
- iv.) To determine the factors affecting the consumption of both fresh and processed fruits.

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	Frequency	Percentage
Male	21	38.9
Female	33	61.1
Total	54	100
Marital status	Frequency	Percentage
Single	50	92.6
Married	4	7.4
Total	54	100
Religion	Frequency	Percentage
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.

RESEARCH METHODOLOGY

Study area

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.

Analyses of the data obtained from the questionnaire are as follows:

- i.) Descriptive statistical analysis: By the use of frequency tables.
- ii.) Regression analysis: To derive the relationship between the dependent and independent variable.

LIMITATION OF THE STUDY

Limitation that was imposed during data collection include:

- i.) Some of the questionnaires were misplaced by the respondents.
- ii.) 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.

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 above shows that data were collected from 29.6, 35.2 and 35.2% of the students of the faculties of Science and Science Education (SSE), Social and Management Sciences (SMS) and Agriculture (AGRIC) respectively. 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. Table 2 shows that 90.6% of the respondents were Christians while 9.3% of the students are Muslims which implies that both religion were not against fruit consumption.

Socio-economic characteristic of respondents

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 e.t.c

Respondent's income distribution

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 in Table 4. The minimum income earned was ₦ 5000, while the maximum income is ₦ 20000. Most of the students earned between ₦11000 - ₦ 16000 as their monthly income. The mean of the total income earned was ₦ 15277.78. 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 ₦ 5000 and the maximum ₦ 10000. The mean of the total monthly food expenditure was ₦ 9037.04.

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.

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 (₦)	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 7. Proportion of income spent on fresh, processed, and both fruit.

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

Source: field survey, October 2008.

Table 7 implies that students who earn less than ₦ 5000 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 ₦ 2296.30.

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.

$$\text{Average income} = \frac{\text{₦ } 82\,500}{54} = \text{₦ } 15277.78$$

$$\frac{\text{₦ } 611.67}{\text{₦ } 15277.78} \times 100 = 4\%$$

Proportion of average monthly income spent on processed fruit

$$\frac{\text{₦ } 875.56}{\text{₦ } 15277.78} \times 100 = 5.73\%$$

Proportion of average monthly income spent on both fruit

$$\frac{\text{₦ } 1487.23}{\text{₦ } 15277.78} \times 100 = 9.73\%$$

This implies that out of 15277.78 averagely earned by students, 4, 5.73 and 9.73% of it was spent on fresh, processed and both type of fruits respectively.

Preference for fresh and or processed fruit

Table 8 reveals that 40.7% of the respondents prefer fresh fruit and 26% of the respondents do not have any preference between fresh and processed fruit models are used to identify the various factors affecting the consumption of fresh, processed, and both type of fruits. 3 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

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
LNMIIV- 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%

$$LNC_F = 1267.183064X_1 + 127.5616907X_2 - 180.3014389LN X_3 - 161.2709819LN X_4 + 11.84380376LN X_5 + .1845765190LN X_6$$

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
LNMIIV- 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%

$$C_{F1} = -3200.828254X_1 + 377.8990566X_2 + 618.1134864LN X_3 + 310.1911913LN X_4 + 47.94316464LN X_5 + 0.4832366361LN X_6$$

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.

Interpretations of Table 9

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

Interpretation of Table 10

- i) The result reveals that all the explanatory variables ex-

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
LNMIIV- X_6	0.2455901668	0.72497879	3.388

Source: Field survey, October 2008.

$R^2 = 0.30$

F - Value - 4.84

*- significant at 5%

** - significant at 10%

$$LNC_{F2} = 861.3488291X_1 + 187.1400906X_2 - 164.9758428LN X_3 - 110.7387180LN X_4 - 0.8550142941LN X_5 + 0.2455901668LN X_6$$

- plain 23% of the total variation in the consumption of processed fruit by Bowen University student.
- ii.) The result 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.
- iii.) Faculty, sex, and food expenditure are not significant, which do not allow for decrease in the amount spent on processed fruit monthly.
- iv.) 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.

Interpretations of Table 11

- i.) The result reveals that all the explanatory variables explains 30% of the total variability on the consumption both fruit by Bowen University students
- ii.) The result reveals that sex, student's monthly income and preference affect the consumption of both fruits.
- iii.) However, the result reveals that the consumption of both fruits by Bowen University student is a direct function of their monthly income.

Conclusion

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 ₦ 15277.78 averagely earned by students 4, 5.73 and 9.73% of it was spent on fresh, processed, and both type of fruits respectively.

RECOMMENDATION

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.

REFERENCES

- Babalola AO (1996). Fruit juice processing, National training Workshop on fruit juice processing, National Agricultural Research project pp. 13-17.
- Platt BS (1962). Tables of representatives values of food commonly used in tropical countries, HMSO, London.
- Samson JA (1986). Tropical fruits 2nd edition. Tropical Agricultural series, Longman scientific and technical Co- published in United States with John Wiley and Sons, Inc, New York pp.1-12.
- Taylor JK (1999). Fruit and vegetables, oxford pergaman fruit National seminar on fruit and vegetables, Texas
- Adelaja BA, Olaniyan AA (2002). Agronomy in Nigeria, A book on the theory and practice of agriculture in the last 33 Years from July 1967 till present. Production of the 10 most Important fruit in Nigeria. Compiled and designed by M.O. Akoroda p. 106.
- Srivastava KP (2007). Dictionary of agriculture, star offset , New Delhi (India) p.111.
- Rice RP, Tindall HD (1990). Fruit and vegetable production in Warm climate, Macmillan publishers limited p. 486.