DIETARY DIVERSITY AND FOOD CONSUMPTION EXPENDITURE OF FISHING HOUSEHOLDS IN MBO LOCAL GOVERNMENT AREA, AKWA IBOM STATE, NIGERIA

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ABSTRACT

The study assessed the dietary diversity and food consumption expenditure of fishing households in Mbo Local Government of Akwa Ibom State. Primary data used for the study were collected using structured questionnaire. A combination of purposive (high concentration of fishing households), stratified (based on the clans)and simple random sampling technique (at village level to reduce bias) was used to select 120 fishing households. Data collected were analyzed usingmean, frequency, percentages, simple regression analysis, Dietary Diversity Scores, and Pearson Product Moment Correlation.Result of socioeconomic characteristics shows mean age of 38.8 years, female majority (52.5%), mostly married (60.0%) with household size 1-3 people, majority 43.3% had Senior Secondary Certificate,fishing experience of six and half years. Average monthly income wasN37, 800. Result of simple regression shows that a thousand naira increase in food consumption expenditure will lead to a 0.2% increase in dietary diversity. Result of Dietary Diversity Score was 80.8% and consideredmoderate. The result of Pearson Product Moment Correlation shows a significant positive but weak relationship between daily food expenditure and dietary diversity.The study recommended that the policy makers should focuson investment geared towards improving the living standard of every household as well as conducting similar study during other seasons and locations to provide changing dietary diversity and household's consumption expenditure from time to time.It was concluded that dietary diversity of fishing households in the study area was generally good and significantly associated with food consumption despite many respondents who fell below recommended dietary thresholds.

Key Words: *Dietary diversity, food consumption, fishing household, Mbo LGA, AkwaIbom State.*

Introduction

Food constitutes a core component of several of the most widely used welfare indicators in the domains of food security, nutrition, health and poverty. This had been accounted for

about 50 percent of the household budget (USDA, 2011). Dietary diversity is a qualitative measure of food consumption that reflects household access to a variety of foods and is also a proxy for nutrient adequacy of the diet of individuals. Dietary diversity refers to the number of different food or food groups are consumed over a given reference period (Swindale&Ilinsky, 2006).

The value of a diverse diet has long been recognized and considered as key element of high quality diet (Arimond&Ruel, 2004; Jayawardera*etal.,* 2013). They also argue that a sufficiently diverse diet reflects nutrient adequacy since no single food contains the entire required nutrient for optimal health. However, it be noted in this direction that the more food groups included in a person's daily diet the greater the likelihood of meeting their nutrient requirements. A variety of food in the diet is therefore considered imperative in ensuring an adequate intake of essential nutrients (Drimie*et al,* 2013).

The value of a diverse diet has over time been recognized by many authors including (Kadiyala andRawat, 2013; Rathnayak*et al.,* 2012;Fjuita*et al.,* 2012). High dietary diversity is highly recommended since it is positively associated with nutrient adequacy. Several studies including those carried out by Mirmiran*et al.* (2006); Jayawardria*et al.*(2013) have demonstrated this positive association between dietary diversity and nutrient adequacy of the diet. In 2003, five out of seven studies reviewed by Ruel revealed a positive association between Dietary Diversity Score (DDS) and nutrient adequacy (Ruel, 2003).

Similarly, a positive relationship between intake from a diversified diet and nutrient adequacy was observed in a search on women of reproductive age living in Mali, Mozambique, Bangladesh, Burkina Faso, and the Philippines (Arimond*et al.,* 2010). In their study, Acham*et al.* (2012) also noted a strong relationship between dietary diversity and micronutrient intake among women in an informal settlement of South Africa. Based on the above arguments, a diverse diet is therefore paramount in meeting the nutrient requirements of a person and more so to those considered vulnerable to nutrient deficiencies such as the pregnant women. Voster*et al.,* (2011) have argued that the dependency on available and affordable staple foods and energy dense but poor nutrient foods, snacks and beverages have aided to the increased vulnerability to the nutrition transition in Africa. Notably, changing from a monotonous diet to a diet with varied rangeof food has been shown to increase energy and micronutrient intakes in developing countries. Based on this, consuming a diversified diet has been recommended by virtually all national and global food-based dietary guidelines (Clausen *et al.,* 2005; Kenney, 2007; Rathnayake*et al.,* 2012). All people therefore need a variety of foods to meet requirements for essential nutrients (Drimie*et al.,* 2013: Hoddinott&Yohannes, 2002).

However, in most developing countries such as Nigeria, micro-nutrients, mal-nutrient is still a major problem of public health attention due to intake of monotonous, cereal-based diet that lack diversity (Kennedy *et al,* 2007; Ruel, 2003). Therefore, with purported increased rate of undiversified diets among Nigerian fishermen and particularly in Mbo Local Government of Akwa Ibom State, prompted periodic examination of the dietary diversity of fishermen in Mbo LGA. This is to ensure that interventions are guided by empirical evidence drawn from research. Hence the study aimed at achieving the following objectives:

(i) to describe the socio-economic characteristics of fishing households in Mbo Local Government Area

(ii) to ascertain the relationship between dietary diversity and household daily food consumption expenditure of fishing households in the study area.

(iii) to determine factor affecting dietary diversity of fishing households in the study area.

The null hypothesis tested in this study were:

$H_{o1:}$ There is no significant relationship between household dietary diversity and daily food consumption expenditure

Methodology

Study area

The study was undertaken in Mbo Local Government Area of Akwa Ibom State. Mbo Local Government Area (LGA) is located between longitude 8.3^0 and latitude 4.6^{11} It is located in South Eastern part of Nigeria and bounded in the North axis by UrueOffong/Oruko Local Government Area, in the south axis by Atlantic Ocean and Cameron, in east by UdungUko Local Government Area and in the west by EsitEket and Ibiono Local Government Area. It occupies a land mass of 365 square kilometers and has the population of 145,300 (National Population Commission, 2016). The primary occupation of Mbo people are fishing and maritime trade which over the past five decades have extended to such foreign countries as the Republic of Cameroon, Equatorial Guinea and Gabon.

Study Population

The study population comprised of all householdsinvolved in fishing activities in Mbo Local Government and respondents were adult household members whether a male or female who could provide answers required for the study.

Sampling Procedure and Sampling Size

A combination of stratified, purposive and multi- stage sampling procedure was used where the area was divided intostrata based on the major clans. The strata were the clans of Enwang, Ebughu, Udeisi, Efiat and Uda.Efiat and Uda was treated as a single strata due to their small sizes.Villages with high concentration of fishing activities and by extension households were

selected purposively. After listing households, a simple random sampling technique was used to select thirty respondents from each strata. This resulted in a total of one hundred and twenty households. Accordingly, a total of 120 respondents were used as sample size for data collection in this study.

Source of Data and Instrument for Data Collection

Data used in this study is cross-sectional and was obtained from the respondents using well-structured and pre-tested questionnaires. Only consenting individuals and households were recruited into the study group.

Data analysis

Objective 1: The socio-economic characteristics of the respondents were analyzed using descriptive statistics such as frequency distribution, percentages, median mode and mean.

Objectives 2: Data on dietary intake from a 24 hour recall period was entered and analyzed. To determine the Dietary Diversity Scores (DDS) of the respondents, a point was awarded to each food groups consumed over the reference period and a sum of all points was computed as recommended by FAO (2011). A scale of sixteen food groups (cereals, vitamin A rich vegetables and tubers, dark green leafy vegetables, other vegetables, white roots and tubers, vitamin A rich fruits, other fruits, flesh meat, organ meat, eggs, fish, pulses/ legumes, nut and seeds, milk and milk products, oils and fats, sweets and sugar and condiments and spices was used. The relationship between dietary diversity and household daily consumption expenditure was computed using simple linear regression analysis.

For this study, this is explicitly specified as $Y = b_o + b_1 x_1 + e$

Where Y = dietary diversity (number of food/food groups consumed).

> b_o = intercept
>
> b_1 = regression coefficient
>
> x_1 = household daily consumption expenditure (N)
>
> e = error term

Objective 3: To determine factors affecting dietary diversity, nine (9) factors were used to determine the prediction of the respondent's behavior .The Four (4) factors with highest frequencies was calculated. The mean values of the scores was used to classify factors affecting dietary diversity of households

Results and Conclusion

The socio-economic characteristics of respondents are shown in Table 1.0

Items	Socio-econ characteristics	Frequency n-120	Percentage % =100	Mean. $\overline{X}$
1	**Sex**	-	-	
	Male	57	47.5	
	Female	63	52.5	
2	**Age**			
	15-29	35	29.1	38.8
	30-44	49	40.9	
	45-59	28	23.3	
	60-74	8	6.6	
3	**Marital status**			
	Single	40	33.3	
	Married	72	60.0	
	Divorced/separated	5	4.2	
	Widowed	3	2.5	
4	**Formal education**			
	No education	12	10.0	
	FSLC	10	8.3	
	SSCE	52	43.3	
	OND/NCE	29	22.5	
	HND/B.Sc	15	12.5	
	M.Sc.	2	1.7	
5	**Household Size**			
	1-3	50	41.7	
	4-6	4.1	34.2	
	7-9	18	15.1	
	10-12	7	5.9	
	13-15	4	3.3	
6	**Monthly Income**			4.7
	1000-19,999	26	21.7	
	20,000-38,999	45	36.6	
	39,000-57,999	30	25	
	58,000-76,999	8	6.6	
	77,000-95,999	3	2.5	
	96,000-114,999	6	4.9	
	115,000-133,999	2	1.7	
7	**Fishing experience**			37,800
	1-9	86	69.9	
	10-18	28	23.3	
	19-27	5	4.2	
	28-36	1	0.8	
				6.5

Source: Field Survey, 2018

Socioeconomic Characteristics of Fishing Households Used in the Study. The result in Table 1.0 shows that majority of them were females (52.5%). The dominance of female in this study suggests that females are mostly responsible for food preparation for the households in the study area. This result is consistent with the findings of Iyadi (2015) who reported more females (68.2%) than males (31.8%) in his study. The mean age of the respondents was 38.8 years. This suggests that most of the respondents were youth;this study therefore reported that the respondent 30-44 years had the highest dietary diversity score of 40.9%. This an indication that youths were mostly exposed to dietary diversity and also highest levels of expenditure on food. This result is similar to that obtained by Otu (2014) which showed that the highest number of food handlers were within the ages of 30-39 years, while the older age group (60-69) were the least. In agreement with this study, many studies have revealed differences in the preferences between younger and elderly consumers leading to different levels of food expenditures on food.

Result in Table 1.0 also shows that majority (60.0%) of the population were married. Themajority of the respondents being married imply that married people involvedthemselves more in food handling than the others.The result in this study is similar to WilhyKahanya (2016) who reported 60.5% for married and 39.5% for single. Educational status of the respondents wasimpressive as majorityhold senior secondary certificates. The predominance of respondents in this class may be due to the rural set-up and occupational nature of the study area. But despite these, the respondents were slightly conscious of food diversity and expenditure. However, more educated respondents try to have more balanced diet model, by choosing several types of food. Thus, there are discrepancies in the level of food expenditure across household. A mean household size of four people was recorded. The majority 41.7% of the respondents recorded 1-3 persons while the minority 3.3% recorded 13-15 persons. This result suggests that most respondents were members of nuclear families. A mean monthly income of N37, 800.00 was recorded by the respondents.Household income explains the purchasing power and status of the household. This study reported that 21.7% of respondent earned N1000-19,999 monthly. This result showed that majority 36.6%of thehouseholds had a monthly income between 20,000-38,999 while minority 1.7% of the respondents had between N115, 000.00-N133, 999.00 as monthly income.The mean monthly income which passes the poverty line suggests that respondents might have been able to secure a diversified diet. This result is in line with the findings of Binkman*et al.,* (2010) who reported that families with adequate income and resources had a more diverse diet.The mean years of the respondents in fishing business was six and half years.As the number of years put into fishing by the respondent'sincreases their technical and managerial

skills over time could also increase hence increases income. This is because a long time active fisherman is thought to have the capacity to develop his managerial ability, has more stability in the fishing business and also attracted many acquaintances or built more and effective customer relationship.

Food groups and their Corresponding Dietary Diversity Scores and Percentage

Information on food groups and their Corresponding Dietary diversity   Scores and Percentage is presented in Table 2.0. The study was interested in the number of households that had scores above 50% of the total score.

Table 2.0 Snapshot of Food Groups and their Corresponding Dietary Diversity Scores and Percentage

S/N	Food groups	Number of households consuming %	Households above 50%
1	Beverage, spices, condiments	118	98.3
2	Other vegetables	114	95.0
3	Oil and fat	111	92.5
4	White roots and tuber	111	92.5
5	Cereals	100	83.3
6	Fish and sea food	99	82.3
7	Vitamin A rich vegetable and tuber	71	59.2
8	Sweets	71	59.2
9	Flesh meat	66	55.0
10	Legumes nuts and seeds	51	42.5
11	Milk and milk products	47	39.2
12	Other fruits	47	39.2
13	Dar green leafy vegetable	32	26.7
14	Egg	32	26.7
15	Organ meat	27	22.5
16	Vitamin A rich fruits	15	12.5

Source: Field Survey (2018)

Food groups and their Corresponding Dietary Diversity Scores and corresponding Percentages

Results in Table 4.2 show that the most commonly consumed food were spices, condiments and beverages (98.3%), other vegetable (95.0%), oil and fats (92.5%), white root and tubers

(92.5%), cereals (83.3), fish and seafood (82.3%) were also highly consumed by the participant. Vitamin A rich vegetables and tuber, sweets, flesh meat and legumes nut and seeds were also consumed in moderation by slightly above half of the respondent at 59.2%, 59.2%, 55.0%, and 42.5% respectively.

Notably, foods of vitamins A rich fruits were least consumed because they were reported to be relatively costly due to scarcity and off-season of some of these fruits. Also, only about 22.5%, 26.7%, 26.7% and 39.2% of the study participants had consumed organ meat, egg, dark green leafy vegetable and other fruits respectively. This study walks in tandems with the work done by Kahanya 2016) with 92.9% for other vegetable and 99.2% for cereals but only differing with milk and milk products (39.2%) which was recorded to be low. However, the dietary diversity of households based on overall dietary scores is presented in Table 4.3

Table 4.3: Dietary Diversity of Households based on overall Dietary Scores

Scores	Frequency	Percentage %	Cumulative percentage
High	23	19.2	19.2
Moderate	97	80.8	100.0
Total	120	100	

Source: Field Survey (2018)

Results in Table 4.3 show that out of the provided sixteen food groups, 19.2% was high with a score ranging from 6-13 food groups. 80.8% of (4-5 food groups) were moderate classes. The dietary diversity scores of most respondents was in the moderate class of (80.8%) of (4-5 food groups), followed by the high class (19.2%) of (6-13) food groups. This study showed that households with moderate dietary diversity score were predominant with 80.8%. The remaining 19.2% was record for household that reflected high with 19.2%. The result showed that households were moderately dietary diversified. Normally, the distribution is supposed to be low, moderate and high, but here low scores were not recorded. This is because of the culture and nature of the study area. The people here are exposed to good meals as a result of variety of ingredient acquired from farm, sea and market. However, the relationship between dietary diversity and household daily food consumption expenditure is presented in Table 4.4

Table 4. 4: Simple regression result showing the relationship between dietary diversity and household daily food consumption expenditure

	B	Std.error	Beta	T	Sig.
Constant	8.336	0.407		20.477	
Daily food consumption expenditure			0.210	2.327	0.022

a. Predictors: (constant), daily food consumption expenditure
b. Dependent variable: dietary diversity
Source: Data analysis (2018)

The result in Table 4.4 shows that the relationship tested is significant (p<0.05) and implies that increasing the amount of money spent on food increases the dietary diversity of the household. Specifically, the result shows that a thousand naira increase in food consumption expenditure will lead to a 0.2% increase in dietary diversity. In a related finding byKahanya (2016), the result showed that income was found to be a predictor; hence, he suggested that increased income is associated with increased probability of having high dietary diversity.

Factor affecting dietary diversity of fishing households
The factors that affect the dietary diversity of fishing household in the study area is shown in Table 4.5

Four highest Scores on Factors Affecting (dietary diversity)	Market Access	Gender	Nutritional Knowledge	Farm technology and storage facility	Education	Income	Production Diversity	Occupation	Health
4(Education)	28	26	33		32	40	27		31
5(Income)	29	29	34	24	42	30	26	26	32
6(Health Status)	24	22	14	25	18	23	28	44	27
7(Occupation)				29				18	
Mean	27	26	27	26	31	31	25	29	30
Rank	5.5	7.5	5.5	7.5	1.5	1.5	9	4	3

Participants' Responses.

Source: Field Survey (2018)

Results in Table 4.5 shows that the first 4 factors with highest frequencies were chosen and they fell between factor 4, 5, 6 and 7. The mean of each of the respected factors was also calculated and then ranked. According to the ranking procedure, Education, (1.5) Income, (1.5) were recorded the highest factors that affected dietary diversity, followed by Heath status (3) and occupation(4), other factor like market access, (5.5), nutritional knowledge (5.5) slightly affected dietary diversity. Information on the Table also shows that factors like gender (7.5), farm technology (7.5) and production diversity (9) less affected the respondent dietary diversity. Theresult of this study is suggesting that the more educated the respondents will be the more they will likely attain a high dietary diversity.

This resultcollaborates the findings of several studies which have reported that dietary diversity is associated with socio-economic status (Rashied*et al.,* 2011, Savy*et al.,* 2008), of which some are listed above. This result further revealed that dietary diversity was influenced by education, occupation and income levels. Moreover, when considering educational level, most fishermen were not educated. Most fisher folks in thecontemporary societyresolved to educate their children for them to maximize the benefits of education. Hence, almost all the knowledge of food diversity came from the educated children in the households sampled.In agreement with this study, a study by Vakili*et al.,* (2013) also showed a significant relationship between dietary diversity scores and economic situations of the respective respondents.

CONCLUSION AND RECOMMENDATIONS

The study has demonstrated that dietary diversity of fishing households in Mbo Local Government Area, Akwa Ibom State was generally good. However, dietary diversity has a significant relationship with food consumption expenditure and as such mentioned that increase in the money spent on food increases though slightly the dietary diversity of households; in spite of this, many respondents fell below recommended threshold (indicated by their dietary diversity scores) and to this end looking at the critical role played by education, the study has also highlighted that increase in educational level of respondents could facilitate increase in dietary diversity as well as increase in food status of households particularly because educated consumers have a different attitude toward diet style and more educated consumers try to have a more balanced dietary model.

The result discussed also highlighted the critical role of education, monthly income, occupation, healthy health status and others in the attainment of high dietary diversity. From

the result of the study the following recommendations are made: factors such as level of education, occupation, monthly income, healthy health status are important determinants of dietary diversity and as such should be considered in policy issues. Extension activities should promote nutrition sensitive education and agriculture to sustain and improve dietary diversity and keep down household expenditure on food.

Policy makers should enact new and support existing policies on investment geared towards improving the living standard of every household. Since the study was undertaken in one season of the food security cycle and perhaps in one geographical area. It should carried out during other seasons and places so that it can continue to provide changing dietary diversity and households consumption expenditure from time to time.

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