

## Evaluation of Household Food Expenditure, Dietary Diversity Scores and Family Nutritional Status in Bauchi Rural Communities

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### ABSTRACT

Household food diversity is one of the major determinants of level malnutrition in the family. This study assessed food diversity and body mass indices of family members in some communities Bauchi local government area of Bauchi state in north-east Nigeria. Data were collected from 368 households selected through multi-stage and random sampling procedures from 13 communities. The instruments used were Semi-structured questionnaire, digital bathroom weighing scale and stadiometer; these instruments were used in accordance with standard practices to collect data from the respondents. The results of analysis indicated that 54.9% of household heads were within the active age of (31-45) years, 67.7% attained Secondary/Islamiyah level of education, while 43.5% engaged in farming as a primary occupation. In addition, 59.8% of the household heads practiced extended family. Results on food consumption showed that 74.2% household consumed 3 meals daily while about 50.5% fairly diversified their food consumption. Household body mass index indicated that about 51.1% of the heads were within normal BMI, 43.5% of wives were underweight and 30.2% of adolescents showed thinness and about 20.4% of under-five children indicated severe thinness. Although, about half of the household fairly diversified their food consumption, the body mass indices of mothers and children were not too encouraging. Hence, efforts should be geared towards improve food diversification in the household by the nutrition officers in the state in order to step up proper food diversification and reduce underweight and thinness among wives and children.

### Keywords

Communities, Food diversity, Family, Household expenditure, Nutritional status.

### Introduction

Food among other basic needs of any household is very crucial in preventing illness and enhancing productivity of members of the household. Household food consumption is greatly influenced by household food expenditure; hence, low budget for food in any household will result in inadequate food consumption, starvation, and poor nutritional status of the household members. Households as units of the larger society are so crucial in the determination of the nutritional and health status of any nation. Access and availability of food in many households show their level of food security and degree of malnutrition that may occur in such households. According to the world health organization (WHO) report on malnutrition: key facts of 2017, Malnutrition, of

different form occurred due poor and unhealthy food consumption that manifested in inadequate vitamins or minerals, overweight, obesity, and resulting diet-related noncommunicable diseases and that about 1.9 billion adults are overweight or obese, while 462 million are underweight [1,2]. Food and Agricultural Organization of the united nation (2015) also substantiated the world health organization in its report on “The State of Food Insecurity in the World 2015” where it was reported that Food insecurity, poor conditions of health and sanitation and inappropriate care and feeding practices are the major causes of poor nutritional status and malnutrition [3]. FAO further states that malnutrition is an abnormal physiological condition caused by inadequate, unbalanced or excessive consumption of macronutrients and/or micronutrients. Every country in the world is affected by one or more forms of malnutrition; this condition is predominant among the rural communities and households with lower social economic status. Household food expenditure and consumption

influenced economic, social, developmental and medical impacts of the global burden of malnutrition [1]. Household malnutrition is greatly amplified by low income, poverty and unemployment of the household heads. People who are poor are more likely to be affected by different forms of malnutrition. Also, malnutrition increases health care costs, reduces productivity and slows economic growth, which can perpetuate a cycle of poverty and ill health [4-8]. Studies have shown that poverty in developing countries, like Nigeria, takes various forms such as low nutritional status, low level of education, decline in the spending on social services, high percentage of household income spent on food, low level of savings, low level of investments and low level of productivity, thus study on household income and expenditure is important in addressing the poverty situation in the country [9].

In Nigeria about two-thirds of total rural households are engaged in crop and livestock production as their main source of livelihood. These households are especially vulnerable to chronic food shortages owing to adverse weather and the unavailability of enough food from home production, especially during the post-plating season [10]. The 2013 Nigeria Demographic and Health Survey revealed that 38% of under-five children in Nigeria are stunted, 29% underweight and 9.2% wasted [11]. Combating malnutrition in all its forms is one of the greatest global health challenges. Women, infants, children and adolescents are at particular risk of malnutrition. Optimizing nutrition early in life—including the 1000 days from conception to a child's second birthday—ensures the best possible start in life, with long-term benefits [1]. Dietary diversity score is one of indicators used to ascertain level of malnutrition in household. The household dietary diversity score (HDDS) is meant to reflect, in a snapshot form, the economic ability of a household to access a variety of foods. Studies have shown that an increase in dietary diversity is associated with socio-economic status and household food security (household energy availability). Household dietary diversity Score (HDDS) is a qualitative measure of food consumption that reflects household access to a variety of foods. Studies have shown that an increase in dietary diversity is associated with socio-economic status and household food security [2,12-15]. According to [16,17] despite the increase in production of food in Nigeria, majority of individuals in the country most especially the rural Nigeria are still not food-secured. [18,19], also reported that over 40% of households across all agro-ecological zones in Nigeria face the problem of severe food insecurity. Food insecurity therefore remains a fundamental challenge in Nigeria. This study was carried out to determine household food expenditure and dietary diversity score in relation to nutritional status of family members in Bauchi rural areas so as to provide empirical information for policy makers, health workers and nutrition extension workers on which to develop strategies to ensure good food for household consumption.

## Methodology

### Study Area

This study was carry out in SabonLayi, Gubi, Inkil, Miri, Guru, Turum, ungwankanawa, Birshin Fulani, Gudum Hausa,

GudumSayawa, Wuntin dada, Sabonkaura, and Yalwankagadama were all of them are rural area of Bauchi LGA of Bauchi state. The study was a descriptive, cross-sectional study.

### Study Population

The study population was households in Bauchi Local Government Area.

### Sampling Frame

Household's within Rural Areas in Bauchi local Government Area.

### Sampling Procedure

The study targeted households in Rural Areas of Bauchi Local Government; multistage simple random sampling was used to select households for the study.

### Multistage Sampling Procedures Table

Random Sampling	Selection
1st Random sampling	Bauchi L. G. A
2nd Random Sampling	13 Rural Communities
3rd Random Sampling	28 Household in Each Community

### Sample Size Determination

$$N = \frac{Z^2 \times P(1-P)}{D^2}$$

Where

N = require sample size?

Z = value of confidence at 95% (standard value 1.96)

P = Prevalence of under nutrition among rural Households members in kwara State, Nigeria = 32% [20]

D = precision of margin error at 5%

$$N = \frac{1.96^2 \times 0.32(1-0.32)}{0.05^2}$$

$$= \frac{3.8416 \times 0.32(0.68)}{0.0025}$$

$$= \frac{3.8416 \times 0.2176}{0.0025}$$

$$= \frac{0.83593216}{0.0025}$$

$$N = 334.37 \quad N = 334$$

Contingency of 10% was added, which is 33.43

$$33.43 + 334 = n = 368$$

### Instruments of Data Collection

- Semi-structured questionnaire was used to collected data from the household heads.
- Weighing scale was used to measure the weight of household members.
- Heightometre/Lenghtometer was used to measure the height of household members.

### Data Analysis

Data collected was analyzed using SPSS version 16.0. Descriptive statistical tools such as frequencies, percentages, mean and

standard deviation was computed.

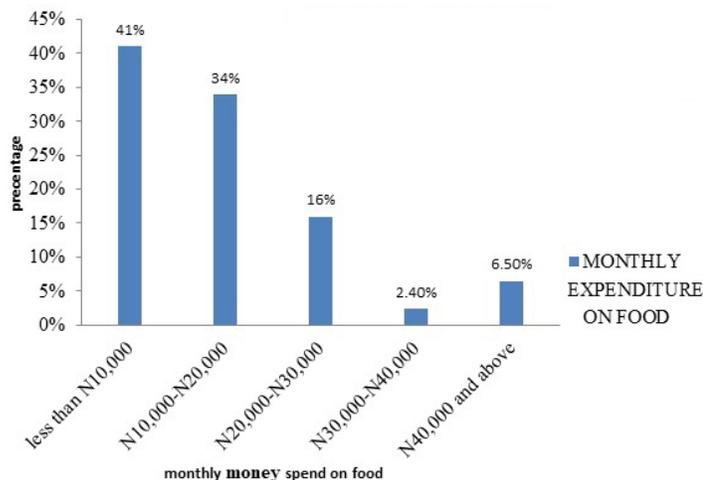
### Ethical Consideration

- Research approval letter was collected from Bauchi local government
- Letter of permission and consent was given to the community's heads
- Letter of Introduction and consent was given to each household head.

### Results

	Variable	Frequency (n=368)	Percentage (%)
Age (years)	18-30 years	40	19.9
	31-45 years	202	54.9
	46-65	114	31.0
	66-above years	12	3.3
Fathers Occupation	Civil servant	77	20.9
	Farming	160	43.5
	Trader	96	26.1
	Others	35	9.5
Fathers' educational level	None	13	3.5
	Primary	49	13.3
	Secondary/Islamic education	249	67.7
	Tertiary	57	15.5
Family Background	Extended	220	59.8
	Nuclear	148	40.2
Number of Children	None	12	3.3
	(0-5)	203	55.2
	(6-10)	105	28.5
	(11 and Above)	48	13.0
Mothers' Occupation	Fulltime Housewife	276	75.5
	Farming	35	9.5
	Trading	38	10.3
	Others	19	5.2

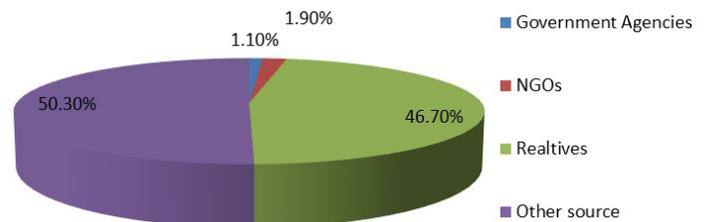
**Table 1:** Household' heads Socio-demographic Characteristics.



**Figure 1:** Chart showing monthly money expenditure on food.

	Variable	Frequency (n=368)	Percentage (%)
Monthly Income of Household Head	Less than 30,000	167	47.8
	30,000-60,000	145	39.4
	60,000-80,000	22	6.0
	80,000-100,000	13	3.5
	100,000 and above	12	3.3
Meal consumption per day	Twice	74	20.1
	Thrice	273	74.2
	Thrice and above	21	5.7
Who gets larger share of household meal?	Husband	92	25.0
	Wife	95	25.8
	Children under five	130	35.3
	Adult	38	10.3
	Others	13	3.5
	Access to loan	Yes	53
Household Source of loan	No	315	85.6
	Government agencies	45	12.2
	NGOs	3	0.8
	Aids Association	3	0.8
	Others	3	0.8
	None	314	85.3

**Tables 2:** Food expenditure and source of household income.



**Figure 2:** Pie Chart Showing Source of food support for Household.

	BMI Categories	Frequency (F)	Percentage (%)	Remarks
Household head	>18.5	27	7.3	Underweight
	18.5-24.9	188	51.1	Normal
	25.0-29.9	122	33.1	Overweight
	30.0-34.9	23	6.3	Obese 1
	35 and above	8	2.2	Obese 2
Wives of in Household	>18.5	160	43.5	Underweight
	18.5-24.9	130	35.5	Normal
	25.0-29.9	37	10.1	Overweight
	30.0-34.9	25	6.3	Obese 1
	35 and above	16	4.3	Obese 2

**Table 3:** Body Mass Index of the Household Head and Wives.

	BMI for age categories	Frequency	Percentage (%)	Remark
Adolescent (10-19) Years	Less than 16.75	21	5.7	severe thinness
	16.76-18.75	111	30.2	underweight
Adolescent (10-19) Years	18.76-25	35	9.5	normal
	25.01-29.00	39	10.6	overweight
	29.01 & above	22	6.0	obese
	Household with no adolescents	140	38.0	-----
	Total	368	100	
Children <5 Years	Less than 16.75	34	9.2	severe thinness
	16.76-18.75	75	20.4	underweight
	18.76-25	45	12.2	normal
	25.01-29.00	19	5.2	overweight
	29.01& above	14	3.8	obese
	Household with no under 5	181	49.2	-----
	Total	368	100	

**Table 4:** Body Mass Index (BMI for age) of the Household Children.

HH Food diversity score	Frequency (f)	Percentage (%)
Poorly diversity (0-25)	32	8.7
Fairly diversity (25-50)	186	50.5
Moderate diversity (50-75)	131	35.6
Well diversity (75-100)	19	5.2
Total	368	100

**Table 5:** Household Food Diversity Score.

Factors	Correlation	P-value	Remarks
Father's education level	0.167	0.003	Significant
Family Background	0.245	0.061	Not significant
Monthly Expenditure on food	0.136	0.078	Not significant
Monthly income of the Household head	0.158	0.002	Very significant

**Table 6:** Correlation between household head BMI with education, family background, expenditure and monthly income of household head.

## Discussion of The Study

The objective of this study was to determine the household head food expenditure and dietary diversity scores and household nutritional status in Bauchi rural communities. The data collected was analyzed and the results revealed that, less than half 34.3% (126) of the respondents were more than 46years old, this age category may influence household heads ability to properly to provide enough food for their households because of possible spate of noncommunicable diseases that have been on the increase in most African communities families as a result aging as stated by [8]. The study also revealed that some of the respondents 43.5% (160) were farmers and they may not be able to grow what will sustain their household members throughout the season, because of inadequate fertilizer, poor extension knowledge, mechanize tools like tractor as stated by [24]. From the study over sixty

percent 68.5% (252) of the household head had secondary/ islamiyya certificate. And majority of the respondents 54.6% (201) were Hausa. 59.8% (220) of the respondents practice extending family and this could possibly contribute to poor nutritional status, adverse health and susceptible table to infection among the household members because there will be many people to feed and in a situation that that the head do not have regular paid income it may adversely affect food provision in the households thereby resulting in poor nutritional status as were observed in studies conducted by [29-33] whereby household nutritional status was greatly affected by large families and lack of regular paid income and low food expenditure.

The study also revealed that, about 2 out of every five children, adolescents and wives were observed to be undernourished. However, about less than 10% of household head was underweight. Children and adolescents need good nutrition to promote and good health and improve their nutritional status and if adequate food supply is hindered there may be delay in developmental stages as well as manifestation of deficiency disorders like anemia, poor growth and poor metal development. Many physical activities engaged in by majority of the wives may contribute to about (43)% them being underweight as majority of the wives were fulltime housewives with no other sources of income except the money given to them to run homes. Women empowerment could address this condition in many household if government and policy makers [21-25]. From the study 50.5% (186) households fairly diversified their foods, food diversity helps to balance the nutrients need of household as well as improve the quality of food consume in household. Certain factors were found to affect Household food diversity. These factors include lack of time of preparation, family income, family size, food availability at home, lack of nutritional knowledge and food preference[9,14-16,33,35,37]. The study also 47.8% of the respondents having the highest frequency 167 income of the household head was less than N30,000, 39.4% (145) N30,000-60,000/monthly respectively. This is contrary to the findings by [22,26-28] that 18% N20, 000 monthly income of the household in Determinants of Food Consumption expenditure among Agro-Based Firms workers in Southern Nigeria.

In this study, 41.0% (151) expenditure on food per month was less than N10, 000 due to unavailability source of income which strongly affect the nutritional status of the household members. Inadequate food expenditure contributes to the poor health and nutritional status of household and mostly affected by this situation are the vulnerable groups such as children, adolescent, pregnant women and lactating mothers as was observed in many studies by [27,30,31,33,38]. The high undernutrition observed in the study findings could be as a result of low money spent of purchase of nutritious food items. Indigent households need to be supported through the food aids in order to reduce undernutrition in most communities in Bauchi.

## Conclusion

Although, about half of the household fairly diversified their food consumption, the body mass indices of mothers and children were

not too encouraging. Hence, efforts should be geared towards improve food diversification in the household by the nutrition officers in the state in order to step up proper food diversity and reduce underweight and among wives and thinness among children.

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