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ANIMAL-SOURCED PROTEIN CONSUMPTION AMONG RURAL FARMING HOUSEHOLDS IN AKWA IBOM STATE, NIGERIA

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ABSTRACT

This study scrutinized farming households' intake prevalence of animal-source protein in Akwa Ibom State, Nigeria. Data were collected from 150 respondents through a multi-stage sampling procedure using a structured questionnaire and analyzed using descriptive statistics as well as OLS regression analysis. Results revealed that seafood was the most readily available animal-source protein for farming households. Respondents prevalently consumed food items from seafood/fish ($\bar{X}$=7.4), cow meat ($\bar{X}$=5.1), and goat meat ($\bar{X}$=4.8). Coping strategies included, borrowing money (97.8%), reducing the number of meals to be taken in a day (96.4%), and depending on less preferred food (93.7%). The constraints were large household sizes and poor credit access. The result of the OLS regression revealed a significant positive relationship between age, meat availability, knowledge level on the importance of protein, health/allergies, and wealth level at a 1% significant level and household consumption frequency of animal-source protein. Equally, a negative significant relationship was observed between educational level and household size and household consumption frequency of animal-source protein at 1% and 5% significant levels, respectively. The study recommended that the Government should launch enlightenment programmes to educate the households on the need for increased consumption of animal-source protein.

Keywords: *Animal-source, protein, prevalence, Farming households*

INTRODUCTION

Despite the growth in the livestock sub-sector of the economy, protein deficiency still persists, leading to malnutrition, reduced productivity, efficiency, diseases, and a generally poor standard of living (Khan, Khan, Jan, and Khan. 2017, Nkeme and Frank, 2022). Protein-energy malnourishment dominance in Nigeria is an upshot of the relatively high cost of animal protein, thus the decline in protein intake (De Vries-ten Have, Owolabi, Steijns, Kudla and Melse-Boonstra, 2020). The fact remains that every household eats at least once a day, but the challenge is what is eaten and how balanced is the food. Protein-energy malnutrition has been the cause of malnutrition indices to many national and global health organizations and the real culprits are unaffordability in price and the dearth of statistics on the request for animal protein-sourced nutrition. The most vulnerable of the population are women and children (Otinwa, Jaiyesimi, Bamitale, Owolabi, and Owolewa, (2023).

A larger proportion of Nigerian rural populace especially women and children do not balance their meals and this contribute to their deteriorated physical health, development and productivity (UNICEF (2023). These rural families either stand down more exclusive animal proteins for plant proteins or eat an inexpensive range of calorie-condensed mueslis and starchy stables which are relatively cheap but not commensurate to animal protein per kg (Ecker and Hatzenbuehler, 2022). This engenders malnutrition which contributes greatly to illness and disease in the rural areas of our nation (Nkeme, 2021). Related but not limited to these risk factors are lesser nutrition, unbalanced nutrition, over intake of certain nutritious constituents (starch, fat and oil) and little intake of sundry nutritious stuffs. This occurrence ravages all age groups and classes of persons in rural settings.

Few scientific studies suggest that family economic expenses are principally prejudiced by the domiciliary income of theirs. Therefore, changes in fiscal expenditure patterns are a reflection of income alterations amongst groups of households. It reflects the heterogeneity in every family fiscal distribution revealing variances in the revenue and liking subject to the affordability of each family's numerous items (Frank, *et. al*, 2017), protein intake not being an exception (Adekunm, Ayinde, and Ajala,2017).

Ecker and Hatzenbuehler, (2022) opined that as of 2022, the per capita daily protein intake in Nigeria was 45.4g per kg of body weight. This figure was lower than both the Food and Agriculture Organization (FAO) (2024) and global daily intake of 53g and 64g per kilogramme of body weight respectively, implying that the country is challenged with poor protein consumption. Protein remains a very useful element of the human diet as it is required for growth, upkeep, repairs of all body tissues, and formation of the foundation of muscles, skin,

bone, hair, heart, teeth, blood, and brain. Proteins are indispensable in the basic constituents of all body cells. They are needed for survival and do not only act as antibodies but also as enzymes, and hormones and as a storeroom or transport protein (Maurya and Kushwaha, 2019). Proteins are virtually central in the body for the critical amino acids they are comprised of.

Protein sources in the human diet can broadly be classified into two, animal and plant. The sources of animal protein are wealthier in vital amino acids than those from plant sources. This is because most animal-sources-protein have completed 20 amino acids vital for tissues of the body synthesis whereas no single plant protein source has such a fit (Protein Challenge, 2020). The challenge is that any absence of one of these amino acids in our daily diet, body tissue synthesis is impaired and full normal and efficient functioning of the body is challenged. The mental and physical situation in Nigeria like any other emerging nation with dwindling insufficient protein intake can better be imagined and the untold effect is not palatable. Plant protein sources on the other hand do not elicit outright condemnation after all there are some nations or persons that a vegetarians with good mental and physical productivity. However, to the heterogeneous eaters, the need to balance animal/plant protein intake cannot be over-emphasised. This is because plant protein lacks vital amino acids like methionine and lysine which can only be obliged in animal-protein-rich diets. This is what the analysis of a balanced diet has brought to the fore with its attendance effects on the health and development of the body.

Eating good food is vital for a healthy and active life. Not only food, but good nutrition are rudimentary privileges of man because they are unavoidably basis for human growth. It is the advancement of the knowledge of nourishment that made food to be accepted as the ultimate source of nutrients. Nutrients can be defined as the substance contained in food, which the body needs to function properly. The three functions of nutrients in food are to provide energy, growth, and protection of the body. Protein contains major nutrients for the evolution, maintenance, and overhauling of human cells and the lack of adequate nutrients in the right proportion in the cells leads to countless adverse health problems including kwashiorkor, reduced cerebral health, degenerative and reduction of muscle tissues, marasmus, oedema, organ failure and contraction of muscle tissues (Khan, Khan, Jan, and Khan. 2017).

Distribution of nutritious foods is unequally done both in the country and within households in Nigeria (Frank, *et. al*, 2017). Nkeme (2021) acknowledged that the Nigerian population and the total demand for food are rising at a disturbing rate sequel to population growth and current food production/supply has not kept pace with it, rather, the present-day food production is

rising at a rather declining rate much lower the population growth rate and food request (Frank., *et al,* 2018). However, the level of malnutrition in Nigeria is cumulative due to the high cost of food products, particularly protein foods (Mekonnen, *et.al*, 2021).

The quest to check this trend has caused the Nigerian Government and indeed some International organizations to fortify the affordable main starchy staple foods with needed protein nutrients. The likes of Vitamin A cassava readily come to mind. Efforts by Governments, plants, and animal breeders are ongoing but rarely documented and its assessment of the rural populace is lacking. Sequel to the fact that protein is the building block of life and must be available in the body system at the needed quality and quantity, it has become pertinent to do this since it is only the animal or plant product on the dining table that is called food. Hence the need to carry out an evaluation study of consumption prevalence of animal-source protein among rural farming households in the study area to bridge the gap of dearth of information on the demand for animal protein source foods in right quantity and quality is imperative. It is on this foundation that this study was conventionally put up to serially study the socio-economic characteristics of rural residents in the study area, identify the most commonly consumed animal-source protein, ascertain the coping strategies used and determine factors influencing consumption animal –animal-source protein. This will help rural programme developers, policymakers, and nutritionists to tinker with the best ways to boost animal protein availability and intake in the country.

Methodology

The Study Area

The study was carried out in Akwa Ibom State, located within the Southeast ecological zone of Nigeria. Its population is 7,245, 935,746 (National Population Commission NPC, 2006) with a total land area of 7,081km² (2,734 sq m). A total of 46-48% of its people live in rural areas with agriculture as their major livelihood jobs (Nigeria - Rural Population (2023). They farm major crops like plantain, fluted pumpkin, cassava, maize, waterleaves, cocoyam, oil palm, coconut, and banana, and nurture animals eg. Sheep, poultry, grass cutter, goat, cattle, rabbit, and artisanal fishing typically done by adepts' fisher-folks living in the coastal zones. The State has six agricultural zones which are: Ikot Ekpene, Abak, Uyo, Eket, Oron, and Etinan.

Sample and Sampling Techniques

Primary data were collected for the work using a well-structured questionnaire, which were administered to the respondents. The Multi-stage sampling procedure was used for the choice of the respondents. The first step involved the random selection of one Local Government Area

(LGA) from each of the six (6) Agricultural Development Project (ADP) zones. In the second stage, five communities were randomly selected from each of the LGA sampled for the study. In the final stage, five rural dwellers were randomly selected from each community selected for the study. For the second and third sampling stages, the LGAs and rural dwellers sample frames were named for the random selection. One hundred and fifty (150) respondents were engaged in the study. Descriptive and inferential statistical tools were used to analyze the data collected. Descriptive statistics such as frequency count and percentage were used to describe the socio-economic characteristics of the respondents and their animal protein food consumption pattern, knowledge level of animal source protein food was ascertained using a four-point-Likert type scale rating with a benchmark of 2.5. The animal protein food consumption patterns were analyzed by grouping the various food items into 9 groups for convenience and using a 7- point scale weighted as 7 = (Every day), 6= (5-6 days in a week), 5= (3-4 days/in a week), 4= (1 -2 days in a week) 3= (once in a week) 2= (during ceremonies) and 1= (never). The frequency of consumption was determined using a 3- category frame and dividing the maximum response to obtain a class mark of 2.33 thus, segmented into 00.0-2.33, 2.34-4.67, and 4.67-7.00 representing; rarely consumed, occasionally consumed, and excessively consumed respectively (Madukwe, 2013). In attempt to find out the commonly used coping strategies among rural farming households, a table containing eleven observations was achieved using a four-point Likert-type scale rating with a benchmark of 2.5. The grand mean of all the observations was further considered and segmented into 1.0-2.0, 2.1-3.0, and 3.1-4.0 representing low, medium, and high respectively. Determinants of prevalence animal source protein food consumption pattern (Y) were estimated using OLS regression with socio-economic variables (Xs). All the functional forms were used and the lead equation chosen based on the best assessed criteria. The constraints associated with the prevalence animal animal-source protein food consumption patterns were ascertained using frequencies, percentages, means, and ranking.

Results and Discussion

Socio-economic Characteristics of the Respondents

Results of socioeconomic characteristics in Table 1 revealed that the mean age of the respondents was 47 years. It shows that most of the respondents were still in an active stage in life which will enhance their farming activities as well as efficient agricultural production for household food security. Furthermore, results show that majority of the respondents (61%) were males. This indicates that males were actively committed to ensuring food availability in their households as well as determine what should be consumed. It also revealed that 52% of the respondents were married, 89.4% read up to primary school, 73.3% had 6-10/households, 79.3% were on full-time farming, 66% got income from N51,000-N90,000 and 82% had no

extension visit. A clear indication that they must not have been taught what to eat to balance their animal protein intake. This deduction is premised upon the fact that modern Extension Education has the food and dietary advisory unit called Women in Agriculture (WIA) where food combinations and dietary requirements are taught.

Table 1: Distribution of respondents according to their socio-economic characteristics

Variable	Frequency	Percentage
Age (years)		
<30	9	6.0
31-39	24	16.0
40-49	56	37.3
50-59	41	27.3
60 and above	20	13.3
Sex		
Female	58	38.7
Male	92	61.3
Marital Status		
Single/Divorced	31	20.7
Married	78	52.0
Widow	41	27.3
Educational level		
No formal school	16	10.7
Primary	82	54.7
Secondary	48	32.0
Post-secondary	4	2.7
Household size		
1-5	33	22.0
6-10	110	73.3
11 and above	7	4.7
Farming		
Full time	119	79.3
Part-time	31	20.7
Income level		
<50,000	37	24.7
51,000-90,000	99	66.0
91,000-130,000	23	15.3
>131,000	6	4.0
Extension Contact		
No Visit	123	82.0
Once	16	10.7
Twice	10	6.3
Thrice	0	0.0

Source: Field survey, 2022

Most commonly Consumed Animal-Source Protein by rural farmers in the study Areas

Table 2 results showed that from the nine different animal-sourced protein groups, 99.6% of the respondents consumed sea foods/fish. This might not be unconnected with its cheapness as

well as affordability. Majority (97.3%) of the respondents consumed cow, perhaps because cow meat is the cheapest of the meats in this area of the country and can be purchased with the least money like two hundred Nair (N200/=), while 94.3% consumed goat meat. Goat meat consumption may not be unconnected with it palatability, taste and its choice for making certain kinds of soups. Pork meat was the least consumed. This may be because of certain religious beliefs of it has no hoof as the bible in the Old Testament forbid the eating of animals with hoofs. The general implication shows that there is a wide range of different animal-sourced protein food groups were commonly available to rural farmers in their farming communities. However, result agrees with the findings of Abdullahi, Hassan, Ayanlere, and Tijani, (2017), who reported that rural farmers consumed more sea/fish food groups with high intake of protein coupled with a parallel decrease in cereals available.

Table 2: Distribution of respondents by mostly Animal -Source Protein Consumed

Animal-Source Protein (Food groups) (%)	Frequency	Percentage
Seafoods/Fish	149	99.6
Pork meat	39	26.0
Cow meat	146	97.3
Chicken	91	60.7
Goat meat	143	94.3
Milk	78	52.0
Eggs	95	59.3
Snails	107	71.3
Bush meat	132	88.0

Source: Field survey,2022

Consumption Pattern of Animal-Sourced Protein Food by Respondents

The consumption pattern of a household is the amalgamation of qualities, quantities, acts, and tendencies typifying a community or a human group's routine resources for existence, well-being, and pleasure (Frank, *et, al;* 2018). Table 3 shows the result of the most commonly consumed animal–sourced protein food at different frequencies in a day by the rural farming households in the area. The result revealed that sea foods/fish (M=7), cow meat (M=5.1), and bush meat (M=4.8) were excessively consumed by animal-source protein food groups by rural farming households in the study area. Furthermore, the result shows that chicken (M=3. 2), eggs (M=2.9), and goat meat (M=2.3) were occasionally consumed while milk (M=1.3) and pork (M=1.2) were scarcely consumed by rural farming households. This implied that the frequency consumption of different animal source protein food by the respondent was occasional. Meanwhile, all the surveyed households consumed seafood/fish and as such, it continues to remain by far the most

important and the most readily available consumed protein food among rural farming households in the area. The analysis paint a picture of dispossessing or deprivation of animal source protein due to budgetary income, affordability and consumption pattern. This is in line with the findings of Ikehi, Onu, Ifeanyieze, and Paradan, (2014) who reported that rural households consumed monotonous diets more frequently. Also, in agreement with the findings Ekwe (2019), found that the majority of the respondents in Eungu State consumed staple food that are readily available and affordable.

Table 3: **Distribution of Respondents According to Consumption Pattern**

Food Groups	Food Consumption Pattern per Day/week								
	7	6	5	4	3	2	1	£x	$\bar{X}$
Seafood/Fish	140	0	0	0	0	0	0	1120	7.0
Cow meats	107	13	2	28	10	0	0	979	6.1
Bush meats	60	34	0	18	7	22	19	780	4.8
Goat meats	0	0	13	40	17	32	58	398	2.3
Chicken	15	6	17	30	44	48	0	525	3.2
Eggs	4	18	11	20	31	27	49	467	2.9
Snails	0	0	8	25	38	33	56	376	2.3
Milk	0	0	0	3	20	9	128	218	1.3
Pork Meat	0	0	0	1	6	17	136	192	1.2
Grand mean									3.5

Source: Field survey, 2022.

Availability of Animal-Source Protein Food Items

Table 4 revealed that 54% of the respondents agreed that they sourced their animal protein food items from the market. This is an indication that the percentage of animal protein food items produced in the study area was either low or relatively costly. If it was found from farm sources (farm gate), then it could have been deduced that it was affordable and easily available, since it could have gone for farm gate price. This is evidenced by 64% of the respondents claiming that animal-source protein was fairly available in the area.

Table 4: Respondents Distribution by sources and availability of Animal Protein Food Items

Variables	Frequency	Percentage
Sources		
Farm produce	47	31.3
Purchase	81	54.0
Gift	22	14.7
Availability		
Available	35	23.3
Fairly available	96	64.0
Not available	19	12.7

Source: Field survey, 2022

Coping strategies commonly used among Rural Farming Households.

The grand mean of all the observations amounted to 2.0 which fell within the low category and used coping strategies during animal source protein food stress included borrowing money ($\bar{X}$ =3.5), reducing the number of animal–source protein meals to be taken in a day ($\bar{X}$ =3.3), and depending on less preferred animal protein food ($\bar{X}$ =3.2). Selling personal belongings/depending on relatives/friends ($\bar{X}$ =3.2), Scavenging/gathering wild fruits for money ($\bar{X}$ =3.2). This implies that the rural people are challenged with severe dietary problem occasioned by rare food supply, meagre income, and absence of good education on food choice leading to malnutrition. Nkeme, (2021) corroborated this finding. She found out that the primary reasons for malnutrition include insufficient food production, derisory dietary intake, patchy food distribution, ignorance, and poverty.

Table 5: Distribution of Respondents on commonly used coping strategies among Households

Statements	£x	$\bar{X}$	Standard deviation
Available qualitative animal protein			
Available in all food items in a day?	200	1.2	0.36
Desiring quantity of animal protein food in a day?	437	2.0	0.52
Skip a whole day's meal?	407	2.5	0.59
Reducing animal-source protein meals food eaten per day?	535	3.3	0.987
Borrow money to eat-animal--source protein food items?	571	3.5	1.17
Reliance on less preferred/expensive animal protein foods?	521	3.2	1.17
Reduce No of animal protein meals to be taken in a day.	481	3.0	0.79
Do some household members eat elsewhere?	489	3.0	0.89
Selling personal belongings/depending on relatives/friends?	517	3.2	0.78
Scavenging/gathering wild fruits for money?	558	3.4	1.14
Do children/household members work for protein food money?	469	2.9	0.87
Grand mean	2.0		

Source: Field survey, 2020 Key: Strongly agree=4, Agree=3, Disagree=2, strongly isagree=1. Decision: $\bar{X}$ >2.5 indicates knowledge and $\bar{X}$ < 2.5 no knowledge

Factors Influencing Consumption of Animal–Source Protein Food Items

Here, the linear functional form was selected as the lead equation because it satisfied all criteria- best fit with the highest significant variables and with the highest co-efficient of multiple determination (R^2). This estimated regression equation showed that the independent variables ($x_1 – x_4$) explicated 34.5% of the difference in the adoption level (y), while the residual 65.5% justified the error term. These could be omitted variables or other forms of exogenous errors outside the control of the researcher. The level of formal education was also

found to be positively related to the consumption of animal protein food items. This shows that a direct relationship between educated rural farming households willing to consume animal protein food items. The household size coefficient is positive, portentous of a positive correlation between household size and consumption of animal protein food items. This meets with the a *prior* expectation. The relationship between farming households and consumption of animal-source protein food was positive. It is an indication of a positive direct correlation between adoption and years of processing experience. Equally, the R^2 is positive and significant at the 5% level.

Table 6: **Regression of factors influencing Consumption of Animal Protein Food Items**

Variables	Linear	Double-log	Semi-log
Constant	0	0	0
	-5.257	-8.384	-28.518
Gender	0.599	0.183	0.686
	-0.527	(-1.348)	-0.405
Education	0.068**	0.225	0.074**
	(-1.834)	-0.228	(-1.800)
Household size	0.001***	0.001***	0.003***
	-3.319	-3.522	-3.036
Frequency of Extension Contact	0.22	0.247	0.204
	(-1.232)	(-1.171)	(-1.276)
Farming	0.000***	0.398	0.000***
Experience	-6.708	-0.852	-6.416
R_2		0.345	
Adjusted R_2		0.306	
Statistics		8.889	

Key: *** (sig at 1%), ** (Sig at 5%) and * (sig at 10%)

CONCLUSION AND RECOMMENDATIONS

The respondents asserted the availability of animal protein but questioned its affordability. They rarely consumed animal protein meals. Seafoods/fish food group (99.6%) was the most consumed class of protein food. Used coping strategies during animal source protein food stress included borrowing money ($\overline{X}$ =3.5) and level of formal education, household size, and farming experience were significant variables that influenced the consumption of animal protein.

The study recommends a vigorous and aggressive enlightenment programme by Extension Staff to educate the farming households on the need for increased frequency in consumption of animal-source protein. The majority did not consume protein because of the cost of purchase.

There is a need for the State Government to support genuine-practicing-livestock farmers with inputs in order to increase production which will force down prices of animal-source protein food to make it affordable. Financial Institutions should be encouraged to give interest-free and or one-digit interest loans to rural livestock farming households to boost livestock production to serve as sources of animal protein and the Women in Agriculture (WIA) Unit of the Extension should be enhanced for more effective tutorials on the combination, dietary requirements and processing of foods products.

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