

## ANALYSIS OF PER CAPITA EXPENDITURE ON ANIMAL PROTEIN DIFFERENTIALS FOR RURAL AND URBAN HOUSEHOLDS IN ABIA STATE, NIGERIA.

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### ABSTRACT

*The study compared per capita expenditure on animal protein in rural and urban households in Abia State, Nigeria. Multistage random sampling technique was employed in selecting 40 rural and 40 urban households from whom data were collected using semi-structured questionnaire. Descriptive and inferential statistical tools were used to analyze the objective. The result showed that among the rural households, 55% were females. 75% of the rural households and 80% of the urban households were married. 90% of rural households and 67.5% of the urban households earned at most ₦100, 000 per month. The mean per capita expenditure on meat among rural and urban households was ₦193.06 and ₦422.31 respectively. The test indicates a significant difference ( $z = -4.051$  at  $P = 0.01$ ). The study further showed that the mean per capita expenditure on fish among rural and urban households were ₦278.29 and ₦452.34, respectively. The test indicates a significant difference ( $z = -3.191$  at  $P = 0.01$ ) in the mean per capita expenditure on fish for the two households with the urban households spending ₦174.05 more on fish consumption. The study showed that urban households spent more on animal protein consumption than rural households. Hence, it is recommended that the government should develop both the poultry industry and increased fish production, this will help to stabilize animal protein prices so as to enhance household's minimum daily animal protein requirement and encourage appropriate consumption of different animal protein types.*

**Keywords:** Per-Capita, Expenditure Animal protein, Rural households, Urban household

### 1.0 INTRODUCTION

Study on per-capita expenditure on animal protein has become one of the contemporary areas of research because of the role animal protein plays in human health. All households in Abia state spent money on one form of animal protein or another and diets seem incomplete without the consumption of animal protein. Proteins are the major structural components of all cells of the body and amino acids are the building blocks of protein. Proteins can function as enzymes, membrane-carriers and hormones (Jensen, 1994; Muhammad-Lawal and Balogun, 2007). Protein contains approximately 22 amino acids, eight of which are essential because the body cannot produce them. Therefore, they must be obtained from our food. Protein is required for the growth, maintenance and repair of all body tissues. Protein is 90% of the dry weight of blood, 80%

constituent of enzymes, hormones and antibodies (Fallon and Eing, 2001).

Proteins encompass many important chemicals including immunoglobulin and enzymes. In short, they form the foundation of muscles, skin, bone, hair, heart, teeth, blood and brain and the billions of biochemical activities going on in our bodies every minute. When we fail to consume adequate amounts of protein, the blood and tissues can become either too acidic or too alkaline. It has been estimated that the daily minimum crude protein requirement of an adult in Nigeria varies between 65 and 85g per person. However, it is recommended that 35g of this minimum requirement should be obtained from animal products (Oloyede, 2005; Britton, 2003). Since long, the proteins have been traditionally divided into two well-defined groups: animal proteins and plant proteins. Animal proteins are the proteins derived from animal sources such as milk, meat, fish, poultry, eggs etc. They are usually called *higher-quality proteins* because they contain and supply adequate amounts of all the essential amino acids. On the other hand, plant proteins are called *lower-quality proteins* since they have a low content (limiting amount) of one or more of the essential amino acids.

Animal sources of protein have many advantages over plant sources because plant sources are typically low in one or more of the essential amino acids notably methionine, tryptophan and lysine which are necessary for proper healthy growth. There is now some controversy regarding the safety of some plant products which is thought by some researchers to be high in mineral-blocking phyates and thyroid depressing phytoestrogens and potent enzymes inhibitors which may depress growth. On the other hand, animal protein especially if obtained from good sources like goat's milk are easier to digest and are substantially less allergenic than other sources (Fallon and Eing, 2001). They are also relatively inferior to animal protein because protein quantity and quality differ widely at different parts as those obtained from root plants are not the same as ones from leafy plants. Some plant proteins have undesirable substances such as aflatoxin (as in groundnut seeds or peanuts, corn and tree nuts) which is said to cause liver cancer in poultry and man. Animal protein is, however, rich in amino acids and is, therefore, described as first class or good quality protein. This has informed a part of the reasons for the acceptability of animal protein. Animal proteins are much more digestible than those of plant sources. Some animal proteins have around 90-99% digestibility whereas those of plant origin

can have a digestibility range from 70-90% (Groff *et al.*, 2009).

Animal protein plays an important role in the food supply for the human society. This is as a result of relatively high content of essential amino acids as compared to proteins of plant origin which contain mostly lower amount of essential amino acids (Adebayo, 2003). Animal protein aids in weight management. Research has shown that moderately increasing protein intake can be an effective and practical way to manage weight. Protein increases satiety more than carbohydrates or fats. Animal protein makes you feel full longer. Lean meat, as a source of high-quality protein, can be a calorie-saver. Heme iron (found in meat) is absorbed more readily than non-heme iron (found in plant-based foods). Magnesium, found in animal protein, is important for the normal function of many enzymes (catalysts for the body's chemical reactors), glucose and muscle action. Animal protein delivers 20 percent of a person's required phosphorous daily intake, which strengthens bones and generates energy in cells. Meat contains potassium, a mineral that helps maintain normal blood pressure. Zinc, found in animal protein, is the key for energy metabolism and the immune system. Thiamin helps the metabolism of carbohydrates, proteins and fats. Animal protein is one of the best sources of thiamin. Animal proteins contain riboflavin; this plays a role in the release of energy from foods. Niacin is involved in the metabolism of sugars and fatty acids, animal proteins can deliver 37 percent of a person's daily requirements. Vitamin B12 which helps build red blood cells and metabolizes carbohydrates and fats is also found in animal protein (Adebayo, 2003).

## 2.0 METHODOLOGY

This study was carried out in Abia State of Nigeria. Abia State is a state in the South eastern part of Nigeria. The capital is Umuahia and the major commercial city is Aba, formerly a British colonial government outpost. The state was created in August 27<sup>th</sup>, 1991 from part of Imo State (Holberg, 2010) and it is one of the nine constituent States of the Niger Delta region. The name "Abia" is an abbreviation of four of the state's densely populated regions Aba, Bende, Isuikwuato and Afikpo (Abia State History 2012). Abia state is one of the 36 states of the federal Republic of Nigeria. It lies within approximately longitude 7° 10' and 8° 02' E and latitude 4° 40' and 6° 14' N. The households were selected through multi stage sampling technique. Out of the three Agricultural zones in Abia State two were purposively selected due to their high livestock activities, the agricultural zones are Umuahia and Aba agricultural zones. Eighty households were selected from these Agricultural zones.

## Model Specification

Comparing the per capita expenditure of animal protein between rural and urban households was analyzed using Z – test. The Z -statistic in line with Nnamerenwa (2012) is given as:

$$Z_{cal} = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S^2 \bar{X}_1}{n_1} + \frac{S^2 \bar{X}_2}{n_2}}} \dots \dots \dots (1)$$

Where;

$\bar{X}_1$  = mean of the per capita expenditure of animal protein types by k<sup>th</sup> households in rural areas;

$\bar{X}_2$  = mean of the per capita expenditure of animal protein types by k<sup>th</sup> households in urban areas;

$S^2 \bar{X}_1$  = squared variance of the per capita expenditure of animal protein types by k<sup>th</sup> households in the rural areas;

$S^2 \bar{X}_2$  = squared variance of the per capita expenditure of animal protein types by k<sup>th</sup> households in the urban areas;

$n_1$  = number of sampled rural households;

$n_2$  = number of sampled urban households.

## 3.0 RESULTS AND DISCUSSION

Table 1 showed that 30% of the rural households and 35% of the urban households were within the age brackets of 36-45years and 46-55years old respectively. The mean ages of the rural and urban households were 48.28years and 49.4years respectively. This implies that most of the respondents are middle aged and are still in their active stage in live. This falls within the range of active age identified by FAO (1992). They can consume different kinds of meats. Nwaru (2004) noted that the innovative ability of people and the capacity to do manual work decreases with age. Urban households were on the average older than those of rural households. A household may become more conservative, more sensitive to health risk that is associated with meat consumption and consequently less willing to consume meat as its age increases in line with the current medical campaign on old people to refrain from red meat consumption in order to protect their heart and avoid heart disease that may result to a sudden death. Table 1 showed also that among the rural households, 55% were females while 45% were males. Similarly, among the urban households 60% were females while 40% were males. This implies that there were more females in both the rural and urban households in the study area (NPC, 2006).

The marital status in Table 1 showed that 75% of the rural households and 80% of the urban households were married while 5.0 percent and 2.5 percent of rural households and urban households respectively were divorced. This implies that married individuals dominated both rural and urban households in the study area. The plethora of married people has huge implication for family labour supply (Ironkwe and Olajede, 2012). Marriage predisposes an individual to become more responsible than ever being since they must cater for their family needs. Therefore, most of

the married youths may have so much responsibility in terms of taking care of a family and will play a cogent role in influencing the meat consumption behaviour of their household especially if the head of the household serve as wives. Table 1 showed that 57.5% of rural households and 72.5% of urban households had a small household size of at most 5 persons per household while 42.5% of rural households and 27.5% of urban households had a large household size of at least 6 persons per household. The mean household sizes were about 5 persons respectively. Both rural households and urban households had moderate households. This moderate household size may have positive implications for these rural farming households since it has been found that most rural households depend on their family members to provide labour on the farm (Nwaru, 2004 and Iheke, 2010). Also, pooling of resources among members of the households may also ensure that they enjoy a high living standard. Household size is also an important factor in most development studies as it determines the extent of expenditure that an average household size can incur as well as indicate what is required to keep up for such households. This assertion was supported by Davis *et al.* (1982) who asserted that household size has a significant impact on aggregate food expenditure especially when there are more young children in the household who do not contribute to household income generation. Table 1 showed that 42.5% of rural households spent at most 15 years of schooling while 45% of the urban households spent at most 20 years of schooling. The mean years of schooling for rural and urban households were 11.3 years and 13.8 years respectively. Majority of the households in the study area had one form of formal education or another and therefore, were educated. All households had at least 6 years of formal education. The implication of this is that these households are better positioned to make rational decision on their animal protein consumption. The attainment of higher educational status also makes individuals aware of the need for responsible behavior and livelihood pattern that would ensure sound wellbeing. Furthermore, Ibeagwaet *al.*, (2012) has argued that educational status has a positively significant impact on expenditures and generation of income. Table 1 showed that 52.5% of rural households engage in livestock farming while 47.5% of them were not engaged in livestock farming. Similarly, the result showed that 77.5% of urban households were not engaged in livestock farming while 22.5% of them were engaged in livestock

farming. This implies that livestock farming is mostly done in the rural area than in the urban area. The dominance of livestock farmers in the rural area could be attributed to the common mixed farming that is practiced mostly in the rural area and the cheap labour cost, feeding cost and easy availability of raw materials in the rural area than in the urban area. Table 1 showed 65% of rural households are not members of cooperative society while 35% of them are. Similarly, the results showed that 80% of urban households are not members of cooperative society while 20% of them are. 85% of rural households do not have access to credit while 15% of them had access to credit. Similarly, the result showed that 82.5% of urban households do not have access to credit while 17.5% of them had access to credit. This implies that access to credit among the respondents is very low. Credit as the capital required for a business to grow from one level to another is very vital in any business. Increased access to credit would enable the households to increase their business and be able to make higher profit. The profit made from business by a household will support them in buying animal protein for consumption. Table 1 showed that 90% of rural households and 67.5% of the urban households earned at most ₦100, 000 per month. The mean monthly income of the rural and urban households was about ₦50, 687.5 and ₦110, 350 respectively. Generally, the incomes of these households are quite low. The higher incomes earned by urban households could be attributed to the increased income arising from their engagement in business, working at public or private firms or companies. The increased income provides more funds for capital investment especially since personal fund is a major source of credit for the respondents. It should also translate into better standard of living for this group of households because as noted by Aigbokhan (2000), there is an assumption by economists that a person with higher income is deemed to enjoy a higher living standard. This will also enable them to afford animal protein for consumption. Table 1 showed that 97.5% of rural households and 77.5% of the urban households spent at most ₦100, 000 per month. The mean monthly expenditure of the rural and urban households was about ₦37, 456.25 and ₦93, 987.50 respectively. The implication is that urban household spent more of their monthly income than rural households. This further indicated that rural household will consume less animal protein than the urban households necessitated by the disparity in their income levels.

**Table 1: Distribution of respondents by socioeconomic characteristic**

Socio-economic characteristics	Category	Rural household		Urban household	
		Frequency	Percentage	Frequency	Percentage
<b>Age</b>	26 – 35	9	22.5	6	15.0
	36 – 45	12	30.0	9	22.5
	46 – 55	8	20.0	14	35.0
	56 – 65	6	15.0	9	22.5
	66 – 75	5	12.5	2	5.0
	Total	40	100.0	40	100.0
	<b>Mean</b>		<b>48.28</b>		<b>49.40</b>
<b>Sex</b>	Male	18	45.0	16	40.0
	Female	22	55.0	24	60.0
	Total	40	100.0	40	100.0
<b>Marital status</b>	Married	30	75.0	32	80.0
	Single	2	5.0	1	2.5
	Divorced	2	5.0	1	2.5
	Widowed	5	12.5	6	15.0
	Separated	1	2.5		
	Total	40	100.0	40	100.0
<b>Household size</b>	1 – 5	23	57.5	29	72.5
	6 – 10	17	42.5	11	27.5
	Total	40	100.0	40	100.0
	<b>Mean</b>		<b>4.95</b>		<b>4.73</b>
<b>Years of schooling</b>	6 – 10	15	37.5	6	15.0
	11 – 15	17	42.5	15	37.5
	16 – 20	6	15.0	18	45.0
	21 – 25	2	5.0	1	2.5
	Total	40	100.0	40	100.0
	<b>Mean</b>		<b>11.27</b>		<b>13.80</b>
<b>Engagement in Livestock farming</b>	No	19	47.5	31	77.5
	Yes	21	52.5	9	22.5
	Total	40	100.0	40	100.0
<b>Cooperative membership</b>	No	26	65.0	32	80.0
	Yes	14	35.0	8	20.0
	Total	40	100.0	40	100.0
<b>Access to credit</b>	No	34	85.0	33	82.5
	Yes	6	15.0	7	17.5
	Total	40	100.0	40	100.0
<b>Monthly Income (₦)</b>	1 – 100000	36	90.0	27	67.5
	100001 – 200000	3	7.5	8	20.0
	200001 – 300000	1	2.5	4	10.0
	500001 – 600000	0	0.0	1	2.5
	Total	40	100.0	40	100.0
	<b>Mean</b>		<b>50,687.50</b>		<b>110,350.00</b>
<b>Monthly expenditure (₦)</b>	1 – 100000	39	97.5	31	77.5
	100001 – 200000	1	2.5	7	17.5
	200001 – 300000	0	0.0	1	2.5
	400001 – 500000	0	0.0	1	2.5
	Total	40	100.0	40	100.0
	<b>Mean</b>		<b>37,456.25</b>		<b>93,987.50</b>

Source: Field survey, 2018

**Comparison of Per Capita Expenditure of Animal Protein Consumption between Rural and Urban Households**

The z-test was used to compare and investigate for significant differences on per capita expenditure of

animal protein demand between rural and urban households in the study area. The result is presented in Table 2.

**Table 2: Test for differences in per capita expenditure on animal protein consumption between rural and urban households**

<b>Per capita expenditure on animal protein consumption (₦)</b>	Mean	Std. Deviation	Std. Error Mean	Df	z- value
Rural per capita expenditure on meat <sup>a</sup>	193.06	230.90	36.53		
Urban per capita expenditure on meat <sup>b</sup>	422.31	267.36	42.30		
<b>Difference (a-b)</b>	<b>-229.25</b>	<b>357.66</b>	<b>56.59</b>	<b>39</b>	<b>-4.051***</b>
Rural per capita expenditure on fish <sup>c</sup>	278.29	238.44	37.73		
Urban per capita expenditure on fish <sup>d</sup>	452.34	234.81	37.15		
<b>Difference (c-d)</b>	<b>-174.05</b>	<b>344.68</b>	<b>54.54</b>	<b>39</b>	<b>-3.191***</b>
Rural per capita expenditure on milk <sup>e</sup>	95.06	137.17	21.70		
Urban per capita expenditure on milk <sup>f</sup>	375.79	344.96	54.58		
<b>Difference (e-f)</b>	<b>-280.73</b>	<b>367.09</b>	<b>58.08</b>	<b>39</b>	<b>-4.834***</b>
Rural per capita expenditure on egg <sup>g</sup>	57.53	82.05	12.98		
Urban per capita expenditure on egg <sup>h</sup>	71.37	90.06	14.25		
<b>Difference (g-h)</b>	<b>-13.84</b>	<b>102.08</b>	<b>16.15</b>	<b>39</b>	<b>-0.857</b>
Rural per capita expenditure on chicken <sup>i</sup>	198.97	435.18	68.86		
Urban per capita expenditure on chicken <sup>j</sup>	282.51	289.76	45.85		
<b>Difference (i-j)</b>	<b>-83.54</b>	<b>559.59</b>	<b>88.54</b>	<b>39</b>	<b>-0.944</b>
Rural total per capita expenditure on animal protein	822.91	778.11	123.12		
Urban total per capita expenditure on animal protein	1604.32	808.64	127.95		
<b>Difference</b>	<b>-781.41</b>	<b>1185.54</b>	<b>187.59</b>	<b>39</b>	<b>-4.166***</b>

Source; computed by the author from field survey data, 2018

The result showed that the mean per capita expenditure on meat among rural and urban households were ₦193.06 and ₦422.31 respectively. The test indicates a significant difference ( $z = -4.051$  at  $P = 0.01$ ) in the mean per capita expenditure on meat of the two households with the urban households spending ₦229.25 more on meat consumption than the rural households. Similarly, the result showed that the mean per capita expenditure on fish between rural and urban households were ₦278.29 and ₦452.34 respectively. The test indicates a significant difference ( $z = -3.191$  at  $P = 0.01$ ) in the mean per capita expenditure on fish for the two households with the urban households spending ₦174.05 more on fish consumption than the rural households (Hussain, 1990). Furthermore, the result showed that the mean per capita expenditure on milk between rural and urban households were ₦95.06 and ₦375.79 respectively. The test indicates a significant difference ( $z = -4.834$  at  $P = 0.01$ ) in the mean per capita expenditure on milk for the two households with the urban households spending ₦280.73 more on milk consumption than the rural households. The higher per capita expenditure on meat, fish and milk made by urban households could be attributed to the increased price of meat, fish and milk necessitated by the difference in the marketing cost of meat, fish and milk in the rural and urban areas of the state. Increase in demand for meat, fish and milk in the urban areas than was witnessed in the

rural areas may further justify the disparity in the per capita expenditure on meat, fish and milk between the two households. As noted by Nnadozie and Nnamerenwa, (2014), increased household income increases expenditure behaviour of households for calories. The increase in income means more funds for capital investment. The study showed that urban households have higher monthly income than the rural households. It should also translate into better standard of living for this group of households because as noted by Aigbokhan (2000), there is an assumption by economists that a person with higher income is deemed to enjoy a higher living standard and therefore will spend more than the person with less income. There was no significant difference in the mean per capita expenditure on egg ( $z = -0.857$ ) and on chicken ( $z = -0.944$ ) between the rural and urban households in the study area. The null hypothesis is therefore rejected for per capita expenditure differential for the two households on meat, fish and milk and was not rejected for per capita expenditure differential for the two households on egg and chicken. The study further shows that urban households mean total per capita expenditure on animal protein of ₦1604.32 was higher than the rural households mean total per capita expenditure on animal protein of ₦822.91 by ₦781.41. The test shows that the difference in the mean total per capita expenditure on animal protein consumption between rural and urban households were significant at 1%

level ( $z = -4.051$ ). This implies that urban households spent more on animal protein consumption than rural households. The null hypothesis is therefore rejected for per capita expenditure differential for the two households on animal protein demand in the state.

#### 4.0 CONCLUSION AND RECOMMENDATION

The study concluded that 52.5% of rural households engages in livestock farming while about 47.5% of them were not engaged in livestock farming. Similarly, the result showed that 77.5% of urban households are not engaged in livestock farming while 22.5% of them were engaged in livestock farming. 85% of rural households do not have access to credit while 15% of them had access to credit. Similarly, the result showed that 82.5% of urban households do not have access to credit while 17.5% of them had access to credit. 90% of rural households and 67.5% of the urban households earned at most ₦100, 000 per month. The mean monthly income of the rural and urban households was about ₦50, 687.5 and ₦110, 350 respectively. 97.5% of rural households and 77.5% of the urban households spent at most ₦100, 000 per month. The mean monthly expenditure of the rural and urban households was about ₦37, 456.25 and ₦93, 987.50 respectively. The result of the Z-test used to compare and investigate for significant difference per capital expenditure of animal protein consumption among rural and urban households in the study area showed that the mean per capita expenditure on meat among rural and urban households were ₦193.06 and ₦422.31 respectively. Hence, it is recommended that the government should develop both the poultry industry and increased fish production, this will help to stabilize animal protein prices so as to enhance household's minimum daily animal protein requirement and encourage appropriate consumption of different animal protein types.

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