



## Assessment of Frequency and Consumption Pattern of Some Indigenous Soups in Delta State

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### ABSTRACT

Dietary intake refers to an individual's consumption of specific foods and nutrients as well as their relative quantities. This study determined the intake frequency and consumption pattern of some indigenous soup in Delta State, Nigeria. The study was conducted in Umutu in Ukwuani LGA, Egbokodo Itsekiri in Warri South LGA, Ekeranvwe in Ughelli North LGA and Bomadi, Bomadi LGA. The population of this study comprises all volunteers from the four selected LGA of Delta State. For accurate and effective sampling method, a comprehensive data of random sampling of four towns in the selected Local Government Area of Delta State was used. The sample involved the selection of 100 volunteers in each of the towns, which brought the sample size to 400. Frequency of consumption of food items was assessed using the food frequency and consumption pattern was determined using questionnaire. The results showed that gender was a stronger determinant of cooking time than other sociodemographic variables. The findings indicated female engage in cooking than male. The highest households cost of soup preparation goes to the *Igbaba ofofo* with a wide margin compared to other soups. Small-households sizes spend less and consumed less soup to ensure that their household members meet up with adequate and nutritious food while large households' sizes spend more on soup preparation. The major firmness of this study is that, it forms a preliminary assessment of some indigenous food frequency and pattern of consumption in Delta State, which is novel.

**Keywords:** Consumption pattern, Delta, Dietary recall, Ethnicity, Food, Soups.

### Introduction

Diet is the sum of food intake by a person.<sup>1</sup> Good eating habits are an integral part of a healthy life and prevention of many health abnormalities. Most people choose foods for reasons other than their nourishing values. Food choices become an integral part of people's lifestyles; it is sometimes difficult to change eating habits.<sup>2</sup> Some factors, such as; preferences, availability, ethnicity, habits, health and nutrition mainly influence foods choices. Dietary patterns determine the nutritional and health status of people and it is affected by several reasons,<sup>1</sup> some of which are enumerated above.

Traditional foods are elusive to define because of the wide variety of fruits, tree leaves and root vegetables they contain. Traditional foods serve as a symbol of heritage, trademark, and culture, besides offering an important opportunity to diversify the food base. Spices are primarily utilized to prepare these foods to stir good health,<sup>3-13</sup> essential to various cultural identities and ethnic groups.<sup>14,15</sup> Indigenous foods are foods that are originated from a specific bioregionalism in concurrence with foods that were instituted into the country.<sup>16</sup>

Dietary assessment is of important to give necessary nutritional interventions at an individual level, public health policies and guidelines at population level.<sup>17</sup> Impressionistic methods used for dietary gauge or assessment are 24 hours dietary recall, dietary cycle, dietary history and food frequency questionnaire (FFQ) method.<sup>17</sup>

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FFQs studies are utilized to decide dietary conduct and the frequency of specific foods or groups of food composition and consumption pattern.<sup>18</sup>

Dietary intake unreliability has been reported to be a difficult experience in epidemiological studies on diet.<sup>18</sup> However, the simplicity in administering FFQs and their cost-effectiveness are powerful advantages. Frequency questionnaires have been used in a previous study for traditional food consumption assessment and nutrient intake estimation.<sup>18,19</sup> This study aimed to assess the consumption pattern of some indigenous soups in Delta State.

### Materials and Methods

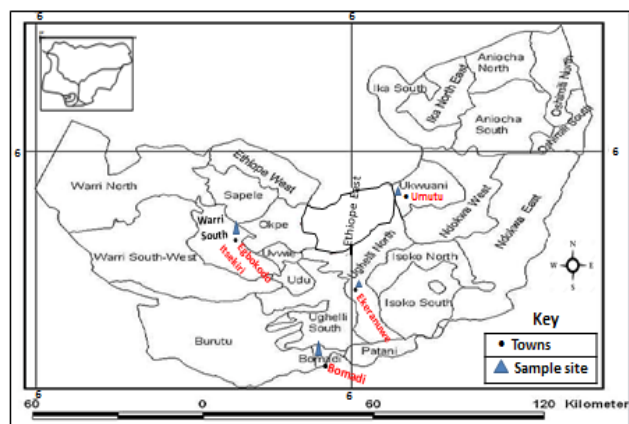
#### Survey area and sample

This study was conducted in four towns of different Local Government Area (LGA) of Delta State; Umutu in Ukwuani LGA, Egbokodo Itsekiri in Warri South LGA, Ekeranvwe in Ughelli North LGA and Bomadi, Bomadi LGA. Delta State is shared into three senatorial districts, namely Delta Central, Delta North and Delta South. Ughelli North has the highest population. Ekeranvwe town is under Ughelli North LGA and they speak the Urhobo language that is accepted by the Urhobos. In Delta North, Ukwuani's has three LGA when added together gives the most recognized ethnic group. In Delta South, the Ijaw's have about four LGA, and some Ijaw's are found in Warri South and Warri Southwest. The Itsekiri are the most populated ethnic group in Warri South.

#### Population of the study

The population of this study comprises all volunteers from four selected LGA of Delta State. This study was maintained under the approval number REC / FOS / 21/01 with respect to the guidelines and standards of the ethical committee Board of Delta State University in Abraka. For accurate and effective sampling method, the researcher

obtained a comprehensive data of random sampling of four (4) towns in the selected Local Government Area of Delta State (Figure 1). The sample involved the selection of 100 volunteers in each of the towns, which brought the sample size to 400.



**Figure 1:** Map of the selected LGA towns of Delta State where samples were collected.

*Preliminary survey*

An initial survey of the type of food they eat was conducted, and the result of this was used to design a questionnaire for the study. Four soups (*Offe ikere*, *Igbagba ofofo*, *Oghwo amiedi* and *Abaikpo* soup) were selected for the study based on the frequency of consumption.

*Data collection methods*

House to house visits were made to interview volunteers on consumption pattern. The objectives of the study was explained to them and volunteers were interviewed on general household dietary practices in terms of meal patterns, types of meals consumed and meal procurement practices using a questionnaire. Frequency of consumption of food items were assessed using the food frequency and the consumption pattern was determined using a questionnaire. In

addition, 3-day food records over 24-hour recall was used to capture detailed information about all foods consumed by the respondent.<sup>20</sup> The data collected were analysed using simple percentage method.

**Results and Discussion**

*Food consumption pattern*

Table 1 presented the 24 h recall of commonly consumed food of respondent from Umutu. Food consumed from 24 h recall (day 1, day 2 and 3) in Umutu trends were: *offe ikere* > *offe iseghe* > white rice and stew > *offe ekwu* > *enemudo offigbo* > jollof rice > *offeune-ibonogi* > rice and beans > oil beans and garri > oil beans and yam > noodles > banga rice > *offe enemudo* > snacks and soft drinks > fruits. The study also showed that 24 h recall of food consumed in Egbokodo locality (Table 2) for day 1 to day 3 trends were: *igbagba ofofo* > *igbagba ikpogiri* > banga soup > white rice and stew > *owo* soup > pepper soup (*igbagba*) > noodles > jollof rice > curry rice > banga rice > boiled potatoes and oil > oil beans and yam > coconut rice > oil beans and garri > fruits. The 24h recall of total food consumed in Ekeranvwe (Table 3) were: oghwo amiedi > emuigari-ishavwo > ogbono soup > oghwo-ewwri > emuigari-ishavwo > white rice and stew > iribo-otor > banga rice > noodles > ukodo > coconut rice > oil beans and garri > jollof rice > curry rice > fruits > oil beans and yam > snacks and soft drinks > boiled plantain and palm oil. In Bomadi the 24 h recall for 3 days (Table 4) trends were: *abaikpo* > *lofia* > jollof rice > *ogborgbofia* > *enemudo offigbo* > white rice and stew > *frifia* > noodles > banga rice > *kirigina* > snacks and soft drinks > boiled plantain and palm oil > oil beans and garri > rice and beans > oil beans and yam. *Igbagba ofofo*, *offe ikere*, *oghwo amiedi* and *abaikpo* were the highly consumed soup in Egbokodo, Umutu, Ekeranvwe and Bomadi respectively. This is not surprising, as this soup is more popular in Delta State, southern part of Nigeria. However, the reason for the low fruit consumption in Egbokodo and Umutu may be the discovery that, eating habits develop within a cultural framework consisting of socially learned thinking styles, values and habits as people become accustomed to them.<sup>17</sup> Notwithstanding, determinants of fruit consumption include price, availability, attitude and knowledge.<sup>22,23</sup>

**Table 1:** 24 h diet recall of commonly consumed food/soup of respondent from Umutu (%)

Time of food consumption	Day 1			Day 2			Day3			Total
	Breakfast	Lunch	Dinner	Breakfast	Lunch	Dinner	Breakfast	Lunch	Dinner	
Fruits	-	3	-	-	2	-	-	7	-	12
Noodles	4	7	-	2	-	7	1	8	3	32
Snacks and Soft drinks	-	10	-	-	12	-	-	4	-	26
Boiled plantain and palm oil	4	7	-	-	10	-	-	4	-	21
Jollof rice	10	2	12	5	4	2	13	8	8	64
White rice and stew	12	8	6	17	7	2	4	4	13	73
Banga rice	7	3	-	-	9	-	10	3	-	32
Rice and beans	7	5	-	-	4	12	11	5	4	48
Oil beans and garri	-	6	-	-	14	9	2	3	-	34
Oil beans and yam	2	3	14	6	2	-	-	15	4	46
<i>Offe Enemudo</i> (ground pepper soup)	-	8	-	6	9	-	2	-	3	28
<i>Offe Ikere</i> (pepper soup)	14	11	25	20	12	20	28	21	25	176
<i>Offe Iseghe</i>	10	13	11	14	2	17	8	4	12	87
<i>Enemudo offigbo</i>	12	2	11	7	4	13	4	9	8	70
<i>Offeune-ibonogi</i> (water leave soup)	4	4	12	9	8	10	8	4	2	61
<i>Offe Ekwu</i> (banga soup)	14	8	9	14	1	8	9	1	18	82
<b>Total (%)</b>	100	100	100	100	100	100	100	100	100	100

**Table 2:** 24 h diet recall of commonly consumed food/soup of respondent from Egbokodo (%)

Time of food consumption	Day 1			Day 2			Day3			Total
	Breakfast	Lunch	Dinner	Breakfast	Lunch	Dinner	Breakfast	Lunch	Dinner	
Fruits	-	3	-	-	4	-	-	-	-	7
Noodles	7	5	-	7	-	-	8	7	2	36
Snacks and Soft drinks	-	8	-	-	8	-	-	9	-	25
Jollof rice	8	5	8	6	-	-	-	-	-	29
Curry rice	5	6	5	-	5	-	5	3	-	29
White rice and stew	10	9	8	16	15	8	15	8	5	94
Banga rice	-	5	9	-	4	-	-	11	-	29
Coconut rice	-	1	-	6	4	-	-	7	-	18
Oil beans and garri	-	5	-	-	5	-	-	4	-	14
Oil beans and yam	-	8	-	-	3	3	-	6	-	20
Boiled Potatoes and oil	-	5	-	2	7	-	-	5	-	21
Owo soup	10	10	20	-	10	20	8	10	6	84
Egusi-pepper soup ( <i>Igbagbalkpogiri</i> )	15	8	10	20	3	10	12	18	10	106
Pepper soup ( <i>Igbagba</i> )	10	7	5	15	-	12	10	-	21	80
Banga soup	15	-	5	10	15	10	27	8	25	105
<b><i>Igbagba ofofo</i></b>	<b>20</b>	<b>15</b>	<b>30</b>	<b>18</b>	<b>17</b>	<b>37</b>	<b>15</b>	<b>4</b>	<b>31</b>	<b>169</b>
<b>Total (%)</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

**Table 3:** 24h diet recall of commonly consumed food/soup of respondents from Ekeranvwe (%)

Time of food consumption	Day 1			Day 2			Day3			Total
	Breakfast	Lunch	Dinner	Breakfast	Lunch	Dinner	Breakfast	Lunch	Dinner	
Snacks and Soft drinks	-	3	-	-	5	-	-	5	-	13
Noodles	17	4	-	8	10	-	7	1	5	52
Fruits	1	4	-	-	5	-	-	6	-	16
Jollof rice	4	2	3	4	5	-	-	8	2	28
Curry rice	2	4	-	4	8	-	2	1	-	21
White rice and stew	14	8	4	-	7	16	-	8	12	46
Banga rice	-	15	4	-	14	-	18	1	-	52
Coconut rice	2	8	-	-	10	8	4	7	7	46
Oil beans and garri	-	4	12	4	4	-	6	5	3	38
Oil beans and yam	-	5	-	-	-	-	-	8	-	13
Boiled plantain and palm oil	-	3	-	-	2	-	-	-	-	5
Pepper soup ( <i>Ukodo</i> )	15	8	-	10	-	2	-	10	5	50
Pepper soup ( <i>Iribo-otor</i> )	10	-	12	2	-	3	3	11	12	54
Egusi pepper soup ( <i>Ovwovwo</i> )	11	2	14	12	4	3	14	2	17	79
<i>Egusi-okro</i> soup ( <i>Emuigari- ishavwo</i> )	5	3	8	13	-	14	8	2	6	57
<b>Banga soup (<i>Oghwo amiedi</i>)</b>	<b>10</b>	<b>15</b>	<b>30</b>	<b>18</b>	<b>18</b>	<b>31</b>	<b>25</b>	<b>10</b>	<b>25</b>	<b>182</b>
Palm oil soup ( <i>Oghwo-ewwri</i> )	8	4	5	6	4	13	7	6	2	55
<i>Ogbono</i> soup	9	8	8	11	4	10	5	10	4	64
<b>Total (%)</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

*Socio-demographic properties of respondents*

Table 5 presented the socio-demographic pattern of participants from Umutu. Male and female participants were 5 and 95, respectively. The respondents of age 21-40 (80) had a BMI of 21.00 -29.40 and age 41 and above (20) had a BMI of 26.10-29.70. The height ranges from 1.60 to 1.70 m while the weight was between 55 to 75kg. Table 6 illustrates the socio-demographic properties of respondents from Egbokodo. Male respondents were 9 while females were 91. Respondents age  $\leq 20$  (9) had a BMI of 23.50 – 26.50. Age from 21 – 40 had 60 respondents with BMI of 23.80-29.50 and age 41 and above had 31 respondents with BMI of 22.70-29.80. The height of respondents was between 1.50 to 1.70 m while the weight was between 42 to 62 kg. Socio-demographic pattern of respondents from Ekeranv we are showed in Table 7, a total of 7 male and 73 female participated in the study. Age of 21 – 40 (82) had BMI of 22.70 - 35.50. Conversely, age of 41 and above had BMI of 24.20 - 32.20. The height of respondents from Ekeranvwe was between 1.50 - 2.00 m and the weight was between 56 -75 kg. The Socio-demographic

characteristics of respondents from Bomadi are shown in Table 8. The results showed that male participants were 11 whereas female were 89 and respondent age  $\leq 20$  (5) had a BMI of 30- 36.10. Age 21 – 40 (67) had a BMI of 27.70 - 38.80 whereas age 41 and above (18) had a BMI of 26.40-34.00.

The height of respondents from Bomadi was between 1.40 -2.20 m and the weight was 55 to 75 kg. The high number of female participants observed in this study could be an indication that female spent time or engage in cooking than male. This finding is in line with previous work of Sharif<sup>14</sup> who described the importance of traditional food practice continuity. It also suggested that gender is a much stronger determinant of time spent in cooking than other socio-demographic variables.<sup>24</sup> According to Lake *et al.*<sup>25</sup>, women living in traditional families are responsible for cooking. The BMI obtained in this study falls with normal and obese range (Table 5-8). Consequently, coordinated efforts should be put together to control this in adults and perhaps to avoid the risk of disease afterward in life.

**Table 4:** Commonly consumed food/soup 24h diet recall of respondents from Bomadi (%).

Time of food consumption	Day 1			Day 2			Day3			Total
	Breakfast	Lunch	Dinner	Breakfast	Lunch	Dinner	Breakfast	Lunch	Dinner	
Fruits	-	-	-	-	-	-	-	-	-	-
Noodles	20	10	-	15	4	-	10	8	-	67
Snacks and soft drinks	-	10	-	-	10	-	5	15	-	40
Boiled plantain and palm oil	-	-	10	-	10	-	-	6	1	27
Jollof rice	20	10	8	9	10	-	10	-	12	79
White rice and stew	23	-	2	-	8	14	-	15	10	72
Banga rice	-	10	5	-	7	10	-	20	18	60
Rice and beans	-	-	10	-	5	6	-	2	-	23
Oil beans and garri	-	10	-	-	10	-	-	5	-	25
Oil beans and yam	7	-	-	-	6	-	17	-	5	30
<b>Abaikpo soup</b>	<b>10</b>	<b>30</b>	<b>32</b>	<b>24</b>	<b>15</b>	<b>10</b>	<b>18</b>	<b>20</b>	<b>30</b>	<b>189</b>
<i>Kirigina</i> soup	-	-	10	10	5	10	5	5	10	55
<i>Ogborgbofia</i> soup	5	5	10	5	5	20	10	4	15	79
Banga soup ( <i>Lofia</i> )	10	10	5	20	5	20	8	5	8	91
<i>Frifia</i> soup	5	5	8	17	-	10	7	5	1	58
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

**Table 5:** Socio-demographic characteristic of respondents from Umutu.

Sex		Age (years)		Height (m) range	Weight (kg) range	BMI (kg/m)
Male	Female	$\leq 20$	-	-	-	-
n = 5	n = 95	21 – 40	80	1.60 – 2.20	55 – 78	21.00 -29.40
		41and above	20	1.68 – 1.70	60 – 75	26.10-29.70

**Table 6:** Socio-demographic characteristic of respondents from Egbokodo.

Sex		Age (years)		Height (m) range	Weight (kg) range	BMI (kg/m)
Male	Female	$\leq 20$	9	1.50 – 1.70	42 – 48	23.50 - 26.50
		21 – 40	60	1.50 – 2.10	50 – 62	
		41and above	31	1.65 – 1.70	50 – 62	23.80 - 29.50
						22.70 -29.80

Household size, cost of preparation and frequency of consumption of soups.

Table 9 shows household size and the number of days popularly consumed soup prepared lasted. The findings showed that household size of < 5 consumed prepared soup lasted 2 days. Household size of 5 – 8, prepared soup lasted 1-2 days. Household size of 9 and above, soup prepared lasted 1 day. However, all of which are required for a healthy living. Table 10 showed the amount used in preparation of soups. *Oghwo amiedi* had the range of ₦ 970 - ₦ 3360 cost of preparation, ₦ 400 - ₦ 900 cost of quantity consumed by household and ₦ 200 - ₦ 300 cost of quantity consumed by individual. *Offe ikere* cost of preparation range from ₦ 570 - ₦ 2500, cost of quantity consumed by a household range from ₦ 500 - ₦ 600 and cost of quantity consumed by individual was ₦ 200 - ₦ 300. *Igbaba ofofo* had

the range of ₦ 1,050 - ₦ 6,050 cost of preparation, ₦ 500 - ₦ 1,000 cost of quantity consumed by household and ₦ 200 - ₦ 400 cost of quantity consumed by individual. *Abaikpo* cost of preparation was ₦ 800 - ₦ 2,100, cost of quantity consumed by household was ₦ 400 - ₦ 900 and individual cost of quantity consumed was ₦ 200 - ₦ 300. The frequency of consumption of *oghwo amiedi*, *offe ikere* and *igbaba ofofo* were; 63%, 44% and 65% for 2-3 times per week, respectively (Table 11). *Abaikpo* had 40% highest frequency for four times or more of consumption per week. The findings corresponds with the report of Elijah *et al.*,<sup>26</sup> who purported that small-households sizes spend less and consumed less soup to ensure that their household members meet up with adequate and nutritious food while those with large households' sizes spend more on soup preparation.<sup>16</sup>

**Table 7:** Socio-demographic characteristic of respondents from Ekeranvwe

Sex		Age (years)	Height (m) range	Weight (kg) range	BMI (kg/m)
Male	Female	≤ 20	–	–	–
		21 – 40	82	1.50 – 1.65	56 – 78
		41 and above	18	1.60 – 2.00	58 – 75
					22.7-35.5
					24.2-32.2

**Table 8:** Socio-demographic characteristic of respondents from Bomadi

Sex		Age (years)	Height (m) range	Weight (kg) range	BMI (kg/m)	
Male	Female	≤ 20	5	1.40 – 1.60	55 – 65	30.00-36.10
n = 11	n = 89	21 – 40	67	1.50 – 1.80	60 – 75	27.70-38.80
		41 and above	18	1.40 – 2.20	58 – 75	26.40-34.00

Key;

If the BMI is less than 18.5, it falls within the underweight range.

if BMI is 18.5 to < 25, the person falls within the normal.

If BMI is 25.0 to < 30, the person is within the overweight range.

If BMI is 30.0 or higher, the person is of the obese range.

Obesity is subdivided into categories:

Class 1: BMI of 30 to < 35

Class 2: BMI of 35 to < 40

Class 3: BMI of 40 or higher.<sup>21</sup>

**Table 9:** Household size and the number of days popularly consumed soups prepared lasted.

Locality	Household Size	Proportion of household	No. of days soup lasted			Total
			1 day	2 days	3 – 4 days	
Umutu	< 5	34	–	30	4	100
	5 – 8	60	5	55	–	
	9 and above	6	5	1	–	
Egbokodo	< 5	30	–	30	–	100
	5 – 8	70	9	61	–	
	9 and above	–	–	–	–	
Ekeranvwe	< 5	35	5	20	10	
	5 – 8	60	10	50	–	100
	9 and above	5	4	1	–	
Bomadi	< 5	38	–	36	2	100
	5 – 8	55	5	48	2	
	9 and above	7	7	–	–	

**Table 10:** Cost/amount of preparation of popularly consumed soups\*

Locality	Name of Soups	Cost of soup preparation	Cost of quantity consumed by household	Cost of quantity consumed by individual
Umutu	<i>Offe ikere</i> (Pepper soup)	₦570 - ₦2500	₦500 - ₦600	₦200 - ₦300
Egbokodo	<i>Igbaba ofofo</i>	₦1,050 - ₦6,050	₦500 - ₦1,000	₦200 - ₦400
Ekeranvwe	Banga soup ( <i>Oghwo amiedi</i> )	₦970 - ₦3360	₦400 - ₦900	₦200 - ₦300
Bomadi	<i>Abaikpo</i>	₦800 - ₦2,100	₦400 - ₦900	₦200 - ₦300

**Table 11:** Weekly frequency of popularly consumed soups.

Locality	Soups	4 times or more (%)	2 – 3 times (%)	Once (%)	Occasionally (%)	Total
Umutu	<i>Offe ikere</i>	35	44	14	7	100
Egbokodo	<i>Igbaba ofofo</i>	14	65	16	5	100
Ekeranvwe	<i>Oghwo amiedi</i>	20	63	15	2	100
Bomadi	<i>Abaikpo</i>	40	39	15	6	100
Total		109	211	60	20	400

## Conclusion

This study showed that gender is a much stronger determinant of time spent cooking than other socio-demographic variables, interestingly; female spent time in cooking than male. The highest households cost of soup preparation goes to the *Igbaba ofofo* with a wide margin compared to other soups. Small-household sizes spend less and consumed less soup to ensure adequate and nutritious food while those with large households' sizes spend more on soup preparation. This knowledge is also essential for health promotion and disease prevention. Efforts should therefore be made to ensure that these concepts are integrated into communication in health and nutrition education.

## Conflict of Interest

The authors declare no conflict of interest.

## Authors' Declaration

The authors hereby declare that the work presented in this article is original and that any liability for claims relating to the content of this article will be borne by them.

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