

Dietary Intake of Pregnant and Childbearing Aged Women within Low Income Families in Ibaji Local Government Area, Kogi State

Oguche, G.H.E.

Department of Food, Nutrition and Home Sciences
Kogi State University, Anyigba.

Abstract

The study investigated the food intake of pregnant and childbearing aged women within low income families in Ibaji Local Government Area. It focused on the major types of foods consumed by these women. Also it assessed the four days dietary intake, and mean daily dietary intake of pregnant and childbearing aged women within the low income families. 100 pregnant and childbearing aged women were randomly selected for the study with the use of 28 villages. Data were collected through the use of clinical Examination, observation, oral interview and direct weighing technique for four consecutive days of: 2 week days and 2 weekend days. Data collected were subjected to statistical analysis, using mean score, standard deviation and percentage 24hrs dietary recall was used to determine the quantity and quality of their food intake. All the subjects have met their recommended dietary allowance in energy (2173kcal), fat (58.3) calcium (450mg), phosphorus (450mg), except iron (30mg), Riboflavin (59.2) and protein (44.6). In conclusion, they were advised to schedule their time and use it wisely in order to have time to prepare their meals and eat them adequately.

Keywords: Food, Intake, Low, Income, Women.

Introduction

Human beings are subsisting on products of plant and animal origin as their foods. Food is the most important basic necessity for human beings other than water and oxygen in body cells are dependent on the intake of food for the supply of nutrients such as carbohydrates, proteins, fats, vitamins, minerals and fibres. Therefore intake of a balanced diet is

of paramount importance for an optimal supply of nutrition to human beings. People have different nutritional requirements, for example children, pregnant women require different levels, pattern of nutrition in comparison to the elderly (Kapila and Zhong - June 2012).

Due to different social, economic, cultural factors, dietary pattern and eating habits that differ from person to

person as well as country to country, people from different religions consume differently, kinds of foods prepared in vary ways. However, the diet and what people desire to eat is decided by many factors such as family income, time available to home maker, resources and others.

Nutrition for each individual represents accumulation of habits formed throughout one's life time. Good nutrition requires that individuals should be well fed for health, growth and for physical and mental development. This could be achieved by consumption of food of diverse types and classes in the right quantity and quality (Agugo and Onimawo, 2009). Nutrition is crucial before, during pregnancy to optimize health for both the mother and the child (Sandra, Procter, Christiana, Campbell, Lucia and Kaiser, 2014). Adequate nutrition for pregnant women is crucial for the health and survival prospects new baby (Yue, Michael, Xuely, Lingxia and Hong, 2009; Oguizu 2015). Adequate nutrition is essential for anybody, including the childbearing aged women, to enhance optimal growth, development and good health because of the rapid growth and brain development taking place at the time there is good nutritional evidence that appropriate in the first year of life, that improve the outcomes of children's physical and mental health throughout life. The provision of adequate nutrition during infancy and early childhood is a basic requirement

for development and provision of optimum growth, health and behaviour of the child (Egbuna, Bral, Neiemogha, Enya, Nebe, Igbasi and Akinyele, 2009; Onyechil, 2011). Maternal nutritional nutrition during pregnancy plays a pivotal role in regulation, development, therefore has the potential to influence both short and long term health outcomes (Yokubu, Dewet and symonds, 2013). Eating adequate diet helps to lesson infection. However, evidence abound suggests on socio-economic position in different periods in the cycle of man, can influence his feeding pattern. (Kwokocha and Nwoko, 2008; Oganah and Dalmecida, 2008).

Poor nutritional status can precipitates diseases and increase its severity. Well nourished individuals are able tolerate and recover from acute illness and trauma (Ademilegun, and Ogudabasis, 2010; Oguntona, 2011, Yue, Michael, Xueli, Lingxia and Hong, 2009; Anyika, 2011; Oguizu, 2015).

Health is refers to a state of physical, mental and social well-being and not merely the absence of diseases or infirmity (Ewabare, 2014). Good health depends on many factors such as food, heredity, hygiene, exercise but food is the most important of all these. For many women, running a home, bringing up children and taking care of relatives, as well as working outside the home, can influence their physical and mental well-being ensuring good nutrition and a healthy lifestyle can contribute significantly to women's

health throughout their lives (Nzeogwu, and Uwaegbute, 2014; Steve-Edemba and Nnam, 2014).

The rapid growth during menstruation and also during pregnancy can result increase risk in low levels of nutrients such as iron, folic and calcium. Survey of malnutrition status frequently demonstrates chronic shortages of these nutrients not only in a woman's earlier years but extending through into later life. Low energy diets slim regimes, eating disorders and the increasing number of vegetarians diet make women even more vulnerable to nutritional inadequacies.

It is important that women of childbearing aged should adopt a life style that optimize health and reduce birth defects, suboptimal fetal development and chronic health problems in both mother and child. (Sandra, Proter, Christiana, Compbell, Lucia and Ikaiser, 2014).

Despite the nutritional stress on women position in society and their well being that begins in child hood, then adolescence and throughout childbearing period, women are held captive by food taboos and the society virtually does not give any opportunity for compromise. Food taboos limit access to food supply and nutritional adequacy among pregnant and childbearing women. Nutritional status of pregnant and childbearing aged women varies with socio-economic, cultural and demographic factors (Mustapha, Ademulegun, Ogundahan, 2010), childbearing aged

women need a lot of iron and folic because they are of iron deficiency anaemia if enough is not taken by them. All women of childbearing aged are capable of becoming pregnant and also consume folic acid every day for the purpose of reducing the risk of having the pregnancy being affected with spinabifida and other neural tube defects.

Low income women may experience a profound effect on subsequent pregnancy outcome, stress and depression may diminish a woman's ability to cope with barriers to healthy eating resulting in poor dietary quality. (Ellen and Miranda, 2011; Fowles, Murphey, Ruiz, 2010).

They may experience stress resulting from inadequate financial resources. Gayle and Adouna, (2012) reported that stressed pregnant woman were more likely to consume energy-dense, nutrient poor foods, thus decreasing their dietary quality during pregnancy. (FRAC, 2016; Steve - Edama and Nnam, 2016).

Poor choice of foods, rather than a shortage of finances, is the usual reason for inadequate nutrition practices (Odenigbo, Odenigbo and Onyeabor, 2010). The choice of what to eat in what form and quantity to be consumed as well as when she is forced to compromise health and nutrition needs in the favour of her family's need (Nnam, Ayugo and Onyeabor, 2014).

The dietary choices which include consumption of cheap energy dense nutrient lean food have increased

prevalence of obesity, associate with poor dietary choices and reduced physical activities has led to serious concern about the dietary habits of all ages (Otitoola, 2014). Food is related to diseases, just as it is related to health, (Sivasqnkar, 2005).

Deficiency diseases such as rickets and beriberi have been found to occur due to insufficient amount of vitamins. These diseases can be eradicated with the use of available better processed and fortified foods, therefore the thrust of this work is to investigate the food intake within low income pregnant and childbearing women in Ibaji Local Government Area.

Purpose of the Study

The main purpose of this study was to investigate the dietary intake of pregnant and childbearing aged women within low income families in Ibaji Local Government Area. Specifically, the study determined:

1. major types of foods consumed by low income pregnant and childbearing aged women in Ibaji Local Government Area.
2. four days dietary intake of pregnant and childbearing aged women within low income families in Ibaji Local Government Area.
3. the mean daily intake of pregnant and childbearing aged women for energy, protein and fat.
4. the food consumption pattern of low income pregnant and childbearing aged women in Ibaji Local Government Area.

5. to access the influence of socio-economic, nutritional knowledge on dietary pattern of pregnant and childbearing women within Ibaji low income families.

Research Questions

1. What is the socio-economic problem that affects Ibaji low income pregnant and childbearing aged women in their dietary pattern in Ibaji Local Government Area?
2. How do nutritional knowledge and time factor influence the low income pregnant and childbearing aged women in Ibaji Local Government Area during their meals preparation?
3. Do pregnant and childbearing aged women in Ibaji Local Government Area low income families have access to high quality foods?
4. What are the reasons why fruits and vegetable are not included in Ibaji low income pregnant and childbearing aged women's food intake?
5. Do stress, depression, food habits and food choices affect the pregnant and childbearing aged women in Ibaji low income families?

Methodology

Design of the study: They has dietary information, oral interview and observation were used based on the research objectives to obtain responses from the respondents. Data collected were used to establish the dietary pattern, socio-economic, nutritional knowledge, and time available to the

pregnant and childbearing aged women in Ibaji Local Government Area, Kogi State.

Area of the Study: The area of study was Ibaji Local Government Area of Kogi State, Nigeria. Ibaji is made of ten wards namely: Unale, Ejule, Onyedega, Iyano, Odeke, Uje Echeno, Akuro, Odomomo and Akuro. Each of the ward constitutes four villages (i.e. 40 villages in total), in Ibaji there are just two geo-graphical divisions - Ibaji Ojukpale (Ibaji North) and Ibaji Ogane (Ibaji South). (Apeh, 2014). Kogi State has 21 Local Government Area of which Ibaji is one. Kogi State has three senatorial districts. Ibaji Local Government Area lies South of Idah town. It has boundary on the East of Idah by river Anambra and on the West by river Niger.

Population for the Study: The population for the study comprised all pregnant and childbearing aged women in Ibaji Local Government Area low income families. Ibaji Local Government Area has ten wards and each ward has four villages (i.e. 40 villages all together). The population for the study consisted of 112 households from 28 villages of 60 pregnant and 60 childbearing aged women in Ibaji low income families. A population of 127,572 in 2006 national census in Ibaji Local Government Area was recorded. Ibaji today is made up of 57 towns and villages (Ape, 2014).

Sample for the Study: Ibaji Local Government Area has forty villages from ten wards. Multistage sampling was used for easy selection.

Stage I: 28 villages were sampled for the study. **Stage II:** Four households from each village was randomly selected for the study i.e. 4 households in each village x 28 villages = 112 households, with the use of seven words, in Ibaji low income Local Government Area. A total of 112 families (of 60 pregnant and 60 childbearing aged were selected for the study).

Data Collection Techniques: The data collected for the study were: Oral interview, observation and dietary information.

Instruments for Data Collection: Oral interview guide and observation checklist/guide were used for data collection. Oral interview was used for the subjects who could speak and write in English Language while observation was used for those who could not understand English Language, shy and bias. Oral interview and observation were based on socio-demographic characteristics such as aged, occupation, income and marital status, Dietary information was also used.

Oral Interview Guide: Oral interview consisted 5 research questions based on dietary pattern including the types of foods consumed, nutritional knowledge, income, demographic characteristics and the time available to the subjects (i.e. 20 pregnant, 10 childbearing aged women). Research questions were framed in closed ended way in order to obtain relevant information required.

Observation Guide: Two technologists were also involved in carrying out observation on the dietary pattern, including the types of foods used, nutritional knowledge, income, demographic characteristics, and time available to the respondents (i.e. 40 pregnant and 50 childbearing aged).

Dietary Information Guide: Dietary information was obtained from the subjects using 24-hour dietary recall and weighing methods (Onimawo, Chinyere, Echendu, Udoli and Njoku, 2004). Each subject that could speak and write in English was given a food record diary to record the details of the food consumed and those subjects who could not understand English language were assisted by investigators to recall and fill their diaries correctly. Two week days and two weekend days were used to conduct dietary investigation according to (Linnea, 1980) stated that four days are sufficient to determine dietary intake of any group of people.

The weighing method involved the weighing of raw foods as purchased, processed, cooked, served and re-weighed by subjects as described by Olusanya, (1977). The nutrient contents were estimated using food composition table.

Data Analysis: All the data collected from oral interview, observation were subjected, mean score and standard deviation and percentage.

Findings of the Study:

1. About ¾ of the women visited during the study, were always on

the farm from 7:30 am to 6:30 pm and they depended on rechauffee cookery (leftover food) because they considered it as time wasting to cook three (3) square meals a day.

2. Due to the nature of their activities, they were used to cooking two types of meals which were dried fish, ogbono soup + Eko (corn pudding), roasted fist + pop corn.
3. Through dietary investigation it was observed that the respondents ate beans sparingly without including vegetables and fruits in their meals and also ate more of energy and protein nutrients at weekend days more than week days.
4. It was observed that the Ibaji low income, pregnant and childbearing aged women were not eating adequately due to lack of time, lack of nutritional knowledge even though they had enough foods.
5. It was observed that some pregnant and childbearing aged women in Ibaji low income families had scurvy and thyroid gland.

Table 1: Major Foods Consumed by the Pregnant and Childbearing Aged Women

Major Food Sources	Food% Score
Yam	10.16
Rice	33.43
Plantain	10.42
Maize	19.66
Sweet potatoes	3.33
Beans	3
Fish	20
Fruits & Vegetables	0
Total	100%

In Table 1, it was observed that fish was the major source of protein eaten by Ibaji low income pregnant and childbearing aged women while rice and maize are the major sources of energy giving foods that they consumed. Beans was eating sparingly without fruits and vegetables.

Table 2: Summary of Four days Dietary Intake of Ibaji Low Income Pregnant and Childbearing Aged Women

Meal	Energy (kcal)	Protein (g)	Fat (g)	Iron (mg)	Calcium (mg)	Phosphorus (mg)	Riboflavin (mg)	Ascorbic Acid (mg)
Breakfast	195	5.9	7.3	1.03	97.3	112	0.2	2.05
Lunch	452	16.4	17.2	2.8	75	132	0.3	1.2
Supper	477	9.8	20.8	2.9	101	159	0.2	6.8
Total	1154	32.1	45.3	6.7	273.3	403	0.9	10.5
Mean	285	16.7	15.2	2.2	913.2	134	0.3	3.4
+SD	2100	7	7	1	14	25.3	1.3	1.9
RDA	2123	44.6	58.3	21	450	450	59.2	30
%RDA	4616	72	77.7	31.9	60.7	89.6	1.5	35
Net	50kcal	12	77.7	32	51	-	-	13.5

In Table 2, it was observed that the subjects have met their recommended dietary allowance in energy, 4616(kcal), protein (72.7g), fat (77.7g), calcium (60.7mg), phosphorus (89.6mg), except in iron (31.9mh), riboflavin (1.5mg) and in ascorbic acid (35mg).

Table 3: Mean Daily Intake of Pregnant and Childbearing Aged Women For Energy, Protein and Fat for two week-days and weekend days

Pregnant Women intake	Nutrient	Weekdays	Weekend days	Childbearing Aged women	Weekdays	Weekend days
	Energy(kcal)	46.5	48.5		38.4	41.9
	Protein(gm)	2.4	3.2		2.2	2.9
	Fat(gm)	3	21		2.5	19.4

Table 3, reveals that the weekend days nutrient contents of both groups of subjects were more than week days for example, the energy contents are 46.5 vs 48.5kcal for pregnant women while that of childbearing aged women were

38.4 vs 41.9kcal. This also imply with protein and fat contents in Table 3.

Discussion

Table 1, reveals the food intake of all the subjects understudy in Ibaji Local Government Area. The intake of nutrients of all the subjects represents

the food habits and food preference of Ibaji community which may reflect the food habits of the people in Nigeria were carbohydrates dominate their diets, this report agrees with (Onimawo, 2004). In table 1, energy sources of nutrients contributed 4616kcal while protein sources of nutrient was only 72%.

Table 2, reveals the summary of four days dietary intake of all the subjects, fats contributed 72%, 60.7% calcium, 89.6% phosphorus, 31.9% iron, 35% ascorbate and 1.5% riboflavin. However carbohydrates contributed 70% food intake of the subjects this is because low income women basically fed on carbohydrate dense food and had low ascorbate 35% and 1.5% riboflavin because there were no inclusion of fruits and vegetables in their meals, most of these women during clinical examination suffered from many disease especially thyroid gland and scurvy which might indicate lack of iodine and vitamins in their food intake, this agrees with (EUFK, 2011; Onimawo, Chinyere, Echendu, Udol Njoku, 2011) is reports.

Table 3 revealed mean daily intake of pregnant and childbearing aged women on weekdays and weekend days. The mean daily energy intake at week days of the pregnant women were lower than weekend days (46.5 vs 48.5kcal) this may be due to not having enough time to prepare food to eat at week days, also were the childbearing aged women had the higher mean energy intake at weekend

days than weekdays (41.9 vs 38.4kcal). This was because they had enough time at weekend days than week days. This implies to all other nutrients, intake of all the subjects studied, in table 3. In most of the studies of food intake pregnant women in developing countries, high energy intake was reported, this agrees with (Onimawo and Offurum, 2015; Eileen, 2011; Maranda, 2011). The pregnant and childbearing aged women in Ibaji have met the recommended dietary allowance in all most all the nutrients in table 2 except the ascorbic acid and riboflavin.

Women do not need to follow a special diet when they are expecting a child. A healthy balance of wholesome every day food satisfies the need of both mother and child and even the child bearing aged women, (Miostoo, Maeravernda, Lyoheilsustoo and Umhverfisstofnun, 2006; Oguizu, 2015). Nutritious food plays a significant role in maintaining a healthy body which is capable with long life, human body needs varying amount for daily activities. Nutrients are obligatory in order to build and repair the cells and tissues in human body. Moreover it helps to control the organs and bones in optimum working condition to provide energy (Kapila, Ratthnayaka and Zhung-Jun, 2012) also agree to this report.

Conclusion

Throughout this study it has been revealed that the Ibaji pregnant and childbearing aged women within the low income families had almost all the food items to meet their recommended dietary allowance but they could not meet all the nutrients especially riboflavin and ascorbic acid in table 2, which are very important for activities and prevention of diseases.

Information was also gotten through dietary investigation that they could not eat adequately due to lack of time because they had to go to farm as early as 7.00 am and return home around 6 pm and also they depended on rehauffee cookery almost every day. It was also observed that they had lack of knowledge of nutrition, wrong choice of food, and food preference and eating habits had great influence on their dietary pattern. Therefore they create a enough time for themselves to enable them plan and prepare adequate meals for their health purpose. Since most of them are mostly farmers they should eat enough adequate meals before they take off for farm early in the morning, rather than eating snacks (Fried corn + roasted fish).

Recommendation

Evaluating a woman's dietary intake is an important of the initial prenatal visit and dietary intake should be assessed frequently throughout the day. In addition health care providers should assess the factors that may enhances or pose as barriers for

healthy eating such passion, stress and eating habits and to identify pregnant and childbearing aged women's needs, more intensive dietary monitoring and intervention are needed.

Nutrition education and counseling seek to improve nutritional practices before and during pregnancy to improve maternal nutrition and reduce the risk of poor health outcome in both mothers and their babies.

To look healthy, is to be well nourished with appropriate quantity and quality of foods. On this basis and the finding of this study, it would be realized that all the pregnant and childbearing aged women from Ibaji low income families will value their time more on farm work than feeding adequately and also value eating quantity of food than quality of food therefore the following are recommended:

- The house wives of the Ibaji Local Government should be enlightened through the mass media on how to plan their budget wisely to suit their meal preparation.
- The pregnant and childbearing aged women should be educated on the importance of eating varieties of foods especially fruits and vegetables.
- The following offers practical and achievable advice for women of childbearing aged:
 - Nourish your body with a healthy diet and be practically active before, during and after pregnancy.

- Counselor should advise the pregnant and childbearing aged women on the importance of iron and other nutrients supplement,
- They should eat different types of nutritious foods.

References

- Agugo and Onimawo, I.A, (2009). Effect of heat treatment on the nutritional value of Mungbean (*Vigna radiata*), Nigerian Journal of Nutritional Sciences, 30(2):10
- Apeh, J. (2014). The people. Ibad: The land and the people. Revised Edition. Published and printed by Onaivi Printing and Pub. Co. Ltd. Lokoja, Kogi State, ISBN: 978-079-295-3, pp. 19.
- Egbuna, K. Bral, B.I.C, Niemogha, M. Enya, Nebe, J. Igbasi, U. and Akinyele, J.C (2009). Evaluation of infant feeding practices Among nursing mothers in Lagos Southern Nigeria, Dept. of Nutrition and Biochemistry, Nigerian Institute of Medical Research Lagos, Nigeria. Nigerian Journal of Nutritional Sciences Vol. 30(2): 17.
- Ellen, S, Melind, M, Manore, John, D. and Gunter (2016): The family Home Nutrition Environment and Dietary Intake in Rural Children. www.mdpl.com/journal/nutrients2015_7,9707-9720di:103390/nu7125495, pp. 9710.
- Food Research and action center, (FRAC), (2016): Why Low Income and Food insecure people are vulnerable to obesity. <http://frac.org/initiatives/hunger-and-obesity/why-are-low-income-q> 7/4/2016, 11:33 Am.
- Fowles, Eillen, R. (2011): Predictors of Dietary quality in Low Income Pregnant Women: A Path Analysis, 60(5): 286 - 294. [doi:10.1097/NNR.0b013e3182266461](https://doi.org/10.1097/NNR.0b013e3182266461).
- Ian Danton-Hill (2013): Library Evidence of Nutrition for Nutrition Action (LENA) Nutrition Counselling during pregnancy, 7/2016 11:21 Am, <http://www.who.int/Elena/bbc/Nutritioncounselingpregnancy/en>.
- Kapila, R.M and Zhong-Jun, W. (2012): Influence of family status on the Dietary Pattern and Nutritional levels of children: Food and Nutrition Sciences, 2012, 3, 1055-1059 <http://dxidoi.org/104236/fins.2012-38140> published online August 2012 (<http://www.GciRP.org/Journal/fine>).
- Karim, O.R., Osang, O.R and Gbadebo, C.T. (2015): Assessment of Anthropometric Status and Dietary Pattern of Pregnant Women in Ilorin South Local Government Area, Nigeria Journal of Home Economics (Nig. JHKC). 5(1), 125-126.
- Nwokocha, L.N and Nwokocha, C (2008). The Role of nutrition in the Management of HIV/Aids, Nutrition society of Nigeria, 39th Annual Conference and Scientific Meeting Proceedings Nutrition: A key to achieving the millennium Development Goals, held in Nsukka, Nigeria. Edited by N.M Nnam, E.C. Okereke, U.A Onyechi and S.U. Onoja.
- Ngwu, E.K, Imokeke, and Ene-Obong H.N, (2009). Consumption pattern of Traditional foods by Women and Children in Igbo cultural communities of Ukehe and Ede-Oballa, Enugu State, Nigeria. Dept. of Home Sciences Nutrition and Dietetics, University of Nigeria Nsukka, Nigerian Journal of Nutritional Sciences, 30(1): 94.
- Nzeagu, O.C., Uwaegbute, A.C. (2014). Nutrient Intake and Functional Ability of older persons by Gender and Age.

- Nigerian Journal of Nutritional Sciences, 35(1):51
- Nnam, N.M., Ayogu, R.N.B and Onyeabor, C.R. (2014). Dietary Pattern, Haemoglobin and Haematocrit Status of Pregnant Women in Ogbaru Local Government Area of Anambra State, Nigeria. *Nigerian Journal of Nutritional Sciences*, 35(1):1
- Oganah, B.C and Dalmeida, L.O (2008). Evaluation of Infant Feeding Practices of low income mothers in Ojo Government Area, Lagos State. Dept. of Home Economics, Faculty of Agric Education. Adenirao Ogunsanya College of Education, Otojanitan, *Nigerian Journal of Nutritional Sciences*. 29(1):39.
- Odenigbo, U.M., Odenigbo, C.U., Oguejiofor, (2010). Eating habits of the Elderly in Asaba, Delta State Nigeria. *Nigerian Journal of Nutritional Sciences*, 31(1):24.
- Onyebuchi, C. (2011). Provision of adequate Nutrition During Infancy and Early Childhood. National Policy on Infant and Young Child Feeding in Nigeria, Federal Republic of Nigeria. Pp. 1.
- Otitoola, (2014). Food Pattern and Nutritional Status of Selected Students in Nigerian Polytechnic, Federal Polytechnic Ede, Osun State Nigeria, *Nigerian Journal of Nutritional Sciences*, 32(2):87.
- Oguizu, A.D. (2015). Assessment of Dietary Intake of Pregnant Women in Obio-Akpor LGA, Rivers State, South-South Nigeria. *Nigerian Journal of Nutritional Sciences* 36(2): 50-51.
- Onimawo, I.A, Chinyere, A. Echendu E. and Udoli, M. (2004): Body Composition of Hypertensive Elders and Middle Aged Men and Women. *Journal of Nutrition for the elderly* 24(2) 62-63.
- Onimawo, I.A. and Offurum, M. (2015). Formulation and Nutrient Composition of Maize Pap (Ogi) fortified with groundnut flour. *Nigerian Journal of Nutritional Sciences*, 36(2):1.
- Sandra, B., Procter, Christiana, G. Campbell, Lucia, L, and Kaiser (2014): Health Lifestyle is crucial for women of childbearing Aged: Updated Position and New Practice Papers of Academy of Nutrition and Dietetics.
- Sivasankar, B. (2005). Food, Health and Disease, Food Processing and Preservation, Prentice-Hall of India-Private Ltd, New Delhi-11,0001.
- Steve - Edemba, C.L and Nnam, N.M. (2014). Feeding Practices and Nutrient Intake of under - five children in orphanages of Federal Capital Territory, Abuja, Nigeria. *Nigeria Journal of Nutritional Sciences*, 35(1):42
- Yue, C. Michael, J.D, Xueli, Z., Lingxia, Z. and Hong, Y. (2009): Assessment of dietary intake among pregnant women in a rural and western China. <http://www.biomedcentral.com/14-71-2458/9/222>.