

**ASSESSING THE NUTRITIONAL STATUS AND  
SELECTED INDIGENOUS FOODS OF PEOPLE IN  
TWO COMMUNITIES IN ABIA STATE**

**A PROJECT SUBMITTED IN PARTIAL  
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**BY**

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## DEDICATION

*This work is dedicated to my Lord and Personal Saviour, Jesus Christ and to everyone committed to improving the indigenous foods of Igbo Cultural Area.*

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## ABSTRACT

This study assesses the nutritional status and traditional foods of indigenous people in two communities in Abia State. As a result of the high rate of food insecurity within the indigenous people, local food resources required investigation to identify food use. Secondly to develop food based strategies to combat malnutrition. The study also assesses some indigenous foods with a focus on their seasonality and attributes in two communities in Abia State. It determines the food consumption pattern of Igbo people in these two communities. It also studies food preparation and micronutrient rich foods commonly consumed among indigenous people and finally determines the nutritional status of children between 0-12 years using anthropometric measurement in the communities.

Two hundred households (one hundred from each community) were randomly selected from lists of households in the communities selected for this purpose of the study. Structured and validated questionnaire developed by the Global Health Research Group from McGill University, Canada was modified to the community setting and was used to collect information on the traditional food list. Information on macronutrient rich foods, the kind and duration of milk fed to the children and the age of introduction of complementary foods were obtained.

The result shows that traditional foods have medicinal, nutritional and socio-cultural values. The study also shows that starchy staples are important in the diet of Ohuhu and Ohiya communities in Abia State. They consume the staples in various forms at least once daily. Crayfish, dried and ice fish are main sources of protein and the quantity consume is a function of one's income. Traditional food systems of indigenous people contain a wealth of micronutrient that have been poorly described and reported in scientific literature. This lack of scientific coverage prevents the information from being included in health training programmes. Fifteen percent (15%) of mothers exclusively breastfed their babies for varying lengths of time. Majority of the mothers breastfed for one year, however, some women continued for two years to meet with the WHO standards. The findings from weighed food intake show that traditional foods provide over 80% of calorie, protein, vitamin, thiamin riboflavin, niacin and ascorbic acid for 0-2 years, 3-5 years and 6-12 years. It confirms that indigenous people prefer to consume traditional food to imported foods. About one percent (1%) of 0-2 years old children in Ohuhu were wasted. Two children (0.5%) and six children (3%) were stunted and underweight respectively. Most malnourished children appeared to be normal to their parents until their weight/height and weight-for-age were compared with expected indicators, respectively. It was observed that in Ohiya, 1% of 0-2 years olds were wasted. Two children (0.5%) were stunted and underweight respectively. There is a significant positive relationship between ( $P < 0.05$ ) traditional food and nutritional status of the indigenous people.

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Background Information of the Study**

Although world food supplies are relatively plentiful today, the rate of malnutrition is still very high. About a million people are hungry worldwide and numbers are still increasing, women and children being the worst hit (Parks, 1997). The number of malnourished people increased from 400 million in 1960, 455 million in 1970 to 800 million in 2000.

Malnutrition has been dubbed the world's "silent emergency", a condition leading to death and disability on a vast scale, particularly among children and women of child bearing age. Malnutrition destroys lives by compromising health, learning, productivity, curiosity, incentive and hope. Malnutrition endangers social and economic cost that cripples the development of individuals communities and nation.

In 2002, Food and Nutritional Policy was launched as an effort of the government to address the issue of food insecurity. In Nigeria, one of the objectives was to promote production, consumption and utilization of indigenous foods. Indigenous foods have met with success to correct various forms of malnutrition. Kuhnlein (2003), shows that indigenous foods are culturally acceptable, affordable and readily available to the people.

Indigenous people refers to a cultural group in a particular ecological area that developed a successful subsistence base from the natural resources available (Kuhnlein, 2003). Universally, within communities of indigenous people, there is a knowledge of

natural resources that influences food environment utilized for optimal nutrition (Kuhnlein, 2003). The diet of many indigenous people has changed over time due to a wide availability of alternative foods, as well as changing perceptions and values of food. In Nigeria, indigenous people have a potential loss of knowledge of our nutritious traditional foods and practices due to a lack of use by the younger generation and also the gradual loss of older people who knew much about these indigenous and traditional foods. This trend leads to the youth imbibing western culture/values. This compounds the already existing nutritional problems within the population. Poor micro nutrient intake and malnutrition are consequences of nutrition transition (WHO, 2003).

Indigenous people need empowerment through the preservation, protection and revitalization of their culture. The culture has been eroded by colonization, western culture and more recently globalization. An assessment of the traditional foods of the people would therefore assist in understanding the indigenous/traditional food uses and advantages.

## **1.2 Statement of Problem**

Many species of both plants and animals are threatened with extinction due to environmental degradation. Indigenous people's environment worldwide is equally disrupted and destroyed. Some economic, agricultural and health/nutritional conditions of these people depended on their local food sources. Indigenous people have a good and rich knowledge of foods that ensure maintenance of good nutritional status. Unfortunately, there is a threat to loss of this knowledge due to poor use by young members of the society and the elders who knew and used these foods are gradually on the verge of extinction. Indigenous people have been recognized to have a good knowledge of natural resources especially of unique food species, which can be used to attain optimal nutrition and have been said to have up to ninety-nine (99%) of global biodiversity (Kuhnlein, 2003). Social and economic changes are threatening the use and propagation of this knowledge thus worsening further the food insecurity plaguing the indigenous people.

There is need to protect these food sources by all mankind (Okeke, Mba and Nwosu 1998). Over the years, food supply has increasingly fallen short of the total food demand. This led to a decline in productivity and is worsened by an uncontrolled population growth or escalation. Food importation has been the only way the government has tried to supplement the increasing food shortage. Unfortunately, our markets became

flooded with commercially prepackage foods. The production and consumption of most appropriate traditional foods for human beings were underutilized. This led to increased consumption of refined foods. The use of these processed foods has been associated with poor micronutrient intake and development of chronic diseases such as obesity, diabetes mellitus and coronary heart disease (FAO, 1997).

Advertisement is one of the consequences of industrialization. It has changed dietary habits, promoted the consumption of unnecessary food items and provided misleading information to people. As a result of the high rate of food insecurity within the indigenous people, local traditional food resources need investigation to identify foods for use to develop food based strategies to combat malnutrition. Not much has been done in assessing nutritional status and traditional foods of indigenous people.

### **1.3 General Objective of the Study**

The general objective is to assess the nutritional status and traditional foods of indigenous people in two communities in Abia State, Nigeria.

#### **1.3.1 Specific Objectives were to:**

1. assess indigenous foods, their seasonality and attributes in two communities in Abia State, Nigeria
2. determine the food consumption pattern of indigenous people in these two communities.
3. study food preparation and micronutrient rich foods commonly consumed among the indigenous people.
4. determine nutritional status of children 0-12 years old using anthropometric / measurements in the communities.

### **1.4 Significance of the Study**

Indigenous people are the most disenfranchised and poorest members of the larger society (Kuhnlein, 2003). They are targeted by most governments for health promotion and development which are of public health significance. There is usually much poverty within this group and social amenities provided by government for high quality of life are either lacking or are of poor quality in their communities.

The present study is a major endeavour to create awareness and thus promote the survival of indigenous foods and culture. Much work has not been done on documentation of indigenous foods of Igbo cultural societies. This would add to the

available data on indigenous foods of the people. The information would be useful to other scholars and organizations who intend to further investigate the indigenous people and their foods such as micro nutrient initiative, UNICEF, WHO, UN, FAO among others. These bodies are interested in using locally available micro nutrient rich foods to improve nutritional status.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

Indigenous people are the descendants of the original inhabitants of the areas where they live. Indigenous societies maintain a unique language, culture and an ancestral relationship to a homeland. The global indigenous population of two hundred and fifty million (250,000,000) people is composed of about five thousand distinct indigenous cultures worldwide. They live in every climate from the arctic circle to the tropical rain forest. Indigenous people make up only four percent (4%) of the world's population, they represent ninety-five percent (95%) of the world's cultural diversity (Kuhnlein, 2003).

#### **2.2 Brief History of Igbo Cultural Area**

The Igbo people live in the area between Benin and Igbala, the Cross River and Niger Delta city - States. They are divided into five major cultural groups, the western or riverine for example Delta area - Awka, Owerri, Cross River and Ogoja Igbo. These cultural groups do not possess a central government. None is a political organization, so None co-operates politically with the other cultural groups.

Regardless of cultural differences between the groups, there are certain features typical of Igbo Societies everywhere. The Igbo respect age, and leadership is bestowed on the elders. The Igbo are individualistic and egalitarian, every man considering himself



meeting of the extended family would take place in a cleared area, near its compounds or inside an elder's compound (Webster, 1980).

### **2.3 Food Consumption and Preparation Pattern Common among the Indigenous People:**

Inadequate consumption of food determines to a large extent what somebody develops to and what the entire society becomes. According to Atinmo (1998), nutrition is a complex subject which involves decisions on food production, transportation, processing, marketing, consumer choice, income and education as well as food availability and palatability. WHO (2003) states that healthy nutrition takes many forms and is understood differently in different countries and among different cultures. Nutritional well-being is determined by nutritional practices that ensure the adequacy of food in terms of quality and quantity. According to Parks (1997), nutritional practices are determined by cultural influences, food production, socio-economic status, health and other services.

Beliefs, superstitions and taboos have great impact on the food consumption pattern of many individuals and communities. According to Oluranti (1997), quoting Rasome-Kuti (1971), study conducted in different parts of Igbo showed that school children were fed inadequate diets due to taboos and superstition. For example, it was superstitiously believed in many Nigerian communities that giving eggs and meat to children would cause them to steal. Also that palm oil and paw paw cause malaria fever. Religion according to Parks (1997) has powerful influence on the food consumption pattern of many people. For example, Hindus do not eat beef and some orthodox ones do not eat meat, fish, eggs and certain vegetables like onions. Muslims do not eat pork. These are taboo foods, which prevent people from consuming nutritious foods even when they are available. Kirk-Meyer and Mathes (2000) state that food attributes affect intake of a particular food. A communication programme in West Sumatra by the International Vitamin A Consultative Group (1992) showed that mothers were apprehensive about the digestibility of green leafy vegetables (glvs). They feared that such vegetables would cause diarrhoea in infants. Pregnant women feared that eating deep green leafy vegetables would cause difficult labour.

The mothers did not think that diet had anything to do with the prevention and control of blindness, anaemia, growth and the general well being of their children. Those things were determined by God and other deities and nothing could be done about them.

In many Igbo communities, it is perceived that conditions like goiter, dwarfism, mental retardation, blindness, among others are caused by nature and nothing can be done to prevent them. Ironically though science shows that these diseases have direct links with malnutrition.

## **2.4 Cultural Factors**

The cultural environment of an individual further plays a prominent role in determining his/her nutritional practices. Hirsch, Matthew, Meiselibe (2005), reports that culture has played a vital role in the introduction and acceptance of soya-beans based products to Nigerians, According to the report, there is a better acceptance of these products in the northern part of the country because they are more used to cereals/grains. Some cultural influences that affect nutritional practices according to Parks (1997) include food habit, customs, beliefs, traditions and attitudes.

Food habits are among the oldest and most deeply rooted aspects of culture. They are associated with love, affection, warmth, self image and social prestige. The family plays an important role in shaping the food habits which are passed from generation to generation. No wonder children tend to adopt the food habits of their parents, especially mothers who take major decisions regarding food choices. Fediuk, Hidioglou, Madere and Kuhnlein (2002). In a study to obtain the view and attitudes of students and mothers on the low amount of milk and vegetables consumed, discovers that consumption of pulses, fibre, cereals and root vegetables was less than the recommended amounts. The study showed that vegetables are usually rejected without being tasted due to smell, texture and appearance because mothers are in charge of purchase and preparation of foods (ACC/SCN, 1998).

In Nigeria today, it is also becoming fashionable and convenient for people to eat outside the home, especially due to proliferation and popularity of fast food business houses and numerous roadside eating places commonly referred to as "Bukateria". (Ibe, 1994) reports that food consumption outside homes precipitates the consumption of inadequate diets.

Customs and traditions are prominent determinants of nutritional practices of people. For example, it is traditional in many communities that titled men are not allowed to eat yellow yam which contains some amount of carotene, (Burlingame, 2000).

## **Food Attributes**

The taste of a particular food is an important attribute that urges an individual to choose and eat it amongst other food items. Ibe (1994), reports that, the information on preferences, likes and dishes depends mainly on the stimulus elicited by the taste. Hirsch *et al* (2005), reports that food attributes influence the level of acceptance and consumption of a particular food.

Also food fads/fallacies significantly influence food selection and preparation and may militate against correction of nutritional deficiencies. For example, some people still parboil vegetable prior to cooking. To this group, preference is the taste of a food rather than its nutritional quality. Availability is another known factor which influences food preference (Ene-Obong, 2001). Child-rearing practices vary from place to place and influence nutritional practices for infants. Examples are:

- (1) premature curtailment of breast feeding by many mothers due to lack of time or the cosmetic reason of maintaining the shapes of their breasts. Atinmo (1998) observed that only 20% of mothers in Nigeria practice recommended exclusive breast feeding for 4 - 6 months.
- (2) adaptation of bottle feeding and commercially refined foods.
- (3) exclusion of oil from the complementary diet of infants as is done in many Nigerian communities.

Atinmo and Akinyele (1983) remarked that Nigerians do not spend enough time in taking care of their children. A lot of people know the right foods to give their children but are constrained by low purchasing power.

## **2.5 Deforestation and Habitat**

Modification has led to destruction of tropical vegetation. FAO (2000) reported that the rapid destruction of tropical forest and other tropical vegetation are estimated to be disappearing at the rate of 40 hectares yearly. All these seriously affect the utilization and consumption of indigenous foods in ensuring food security. The economy in many Igbo culture communities depend on its agriculture, however, the nation's wealth depends on the people and the land (FAO, 1985). Consequently, indigenous lands currently under cultivation must be campaigned against degradation and extensive wildfire. There should also be campaign against business or organization whose activities pose a threat to individual and collaborative right of indigenous communities. The promotion of

indigenous food plants in ensuring household food security rests on nutritional ecological and economic argument (FAO, 1985).

These indigenous foods can play important part in the provision of essential nutrients and the consumption of adequate diet. As such, there is a move to assist indigenous people build organization, manage natural resources, preserve their language and culture and become economically independent.

## **2.6 The Indigenous Food List, Seasonality and Attributes among Different Age Groups**

Traditionally, Igbo people in Abia State rely on cassava (*Mamhot esculianta*), yam (*Dioscorea rotundata*), plantain (*Musca paradisaca*), rice (*Oriza saliva*), cocoyam (*Colocasia esculenta*), maize (*Zea mays*), millet (*Pennisetua Americanum*), potatoes (*Ipomea batatas*), African yam beans (*Stenocarpavulgaris*) for their daily meals.

Fruits and vegetable are consumed when in season. These fruits include udara (*star apple*), ugiri (*irvingia spp*), grape, ground-nuts, guava, mango. Vegetables include ugu (*Telfena occidentalis*), achara oyibo (*Cympogon*), uda (*Aethiopicum*), deep green leafy vegetable, pumpkin seed.

Corn, fruits, vegetables and legumes form part of our subsistence crops. Eighty to ninety percent (80 - 90%) of cereals, roots and tubers are used as cash crops by Igbo people. Traditionally, families prepare foods in their homes.

Food production is much more during the rainy season. Foods are abundant and cheap in this season also, for example yam, cassava, cocoyam, plantain, vegetables and legumes. The indigenous people consume foods as much as needed during the time of abundance. However, during the dry season, when harvesting is already completed, food crops become scarce and costly. This is partly because hot weather promotes food spoilage and decay in addition to inadequate transport and storage facilities. Most roads are bad and unmotorable leading to difficulties in transporting food items to the town. People tend to use traditional storage systems like sun drying and salting to preserve foods.

There is no means of storage of fresh fruits and vegetables however, and as such they are very scarce during dry season. The few that are available in the market are usually very costly. During the dry season, most villages have acute shortage of water. Some have tap water which do not run daily and some do not have any source of water supply. Dry season in Igbo culture areas are periods of hunger due to scarcity of foods.

The villagers categorically state that they consume whatever is available regardless of nutritional quality to appease hunger. The men's major work during this period of scarcity is hunting, however they are constrained by deforestation, (Durning, 1992).

## **2.7 Micro Nutrient Situation of the People**

An unacceptable high level of micronutrient malnutrition persists in spite of commitments made at the International Conference on Nutrition (ICN) in 1992 and World Food Summit in 1996 to drastically reduce such micronutrient malnutrition. Iron deficiency, the world's most wide spread micronutrient nutritional disorder, affects about two million (2,000,000) people mostly women and children in developing countries. Vitamin A deficiency (VAD) affects more than two hundred million (200,000,000) people. It is the major cause of preventable visional impairment and blindness (WHO,

2000). It is estimated that two hundred and fifty thousand to five hundred thousand (250,000 - 500,000) children become blind yearly due to VAD and about half of them die. The deficiency mostly affects resources of poor, rural communities who derive most of their income from subsistence farming. Consumption of vegetables, legumes, fruits is the most sustainable way to reduce and control micronutrient deficiencies in poor resource communities (WHO, 1995).

Indigenous vegetables, besides being micronutrient rich, have the added advantage of possessing other desirable nutrients (Okeke *et al*, 1993). The vegetables are often easier to grow. The Food and Nutrition Division of United Nations, Food and Agriculture Organisation (FAO) - Regional Centre have conceptualized a project to reduce vitamin A and iron deficiencies through increased production and consumption of indigenous foods. Improved vegetable production, food crops and consumption are the most direct low - cost way for many rural and urban poor communities to improve their nutritional status and enhance their quality of life. Development of indigenous vegetable production provides employment opportunities to the expanding population. In addition, vegetable permits year-round production and provides a diet rich in micronutrients.

Shenkin (1997) reports that micronutrient deficiency not only cause symptoms of severe deficiency, but may also cause more subtle effects on tissue function, including immune deficiency, stunting, under weight and oxidation damage. Rohando and Rosalia (2000) associate poor development with vitamin A, iron and iodine deficiencies. They remark that the deficiencies usually occur in disadvantaged circumstances. They equally

report that poor nutrition affects psychological health for example, "the effect of nutrients on mood and the established fact that iron deficiency anaemia is particularly common in women. It is associated with apathy, depression and rapid fatigue.

A recent study conducted by Pelletier and Frongillo, (1995), suggest that iron, zinc, calcium and other micronutrients intakes are low in both home and food provided at day care centres and bukaterias.

According to Oluranti (1997) quoting Ransome - Kuti (1971), low purchasing power and ignorance contribute to inadequate diet consumption in Nigeria.

### **2.7.1 Socio-cultural Benefits/Importance**

Social benefits of farming include maintenance of social ties through the distribution of farm produce and provision of foods for feast, recreational value and physical exercise.

Palm oil is important in the cultural life of the people because it is used on all festive occasions, such as marriage ceremonies (traditional & religious) naming and churching ceremonies.

## **2.8 Culture as it Relates to Indigenous People's Food and Benefits**

Food, as well as providing for the foundation of physical health, is very important to our wellbeing as cultural and social beings. It is this none-nutritional attributes (cultural and social) of food that distinguishes us as humans from other forms (Freeman, 2004).

The diversity of culture is an important element in the domestication and use of diverse plant foods. The food use of a crop changes as it moves from one environment and culture to another. Similarly, some plant varieties and species survive in unique environments. This is because of their values in local food culture. In Africa, Asia and America, records shows that there are distinctive food cultures that are important for human health and also for the conservation of agricultural biodiversity (Ezyaguire, 2004). In Igboland, yam (*Dioscorea, rotundata*) is the king of crops, and on it the livelihood and well-being of the whole community depends. In traditional Igbo society, many different kinds of talents were recognized and welcomed. The outstandingly successful farmer took the title of "yam king" (Ezeji, Uduji, Omeji etc). The fetish priests (traditional deities) sacrifice a lot using fowls and yam. Yam is thus very central in traditional religious worship.

Indigenous foods are foods with special nutrition and health benefits proved with scientific evidence. These foods vary from frequently used to very frequently used. Some of their foods are diversely used in the treatments of one ailment or another which if fully analysed will go a long way to assist not only indigenous people of Igbo land but also the entire people of the world. Some plants are used as medicine e.g. dogonyaro, bitter leaves, guava leaves. Some are used as food, some for religious rituals and others are used as "placebo". The rest are for baths e.g., when one is sick, after childbirth and also in casting out demons as in "Ogbanje".

Enjoying traditional food demands a lot of actions. The production of many traditional foods requires considerable amount of physical exertion of energy. For instance - preparation of mounds with hoes, clearing ground with cutlass and trimming of yam tendrils are all intense form of manual labour. Trimming yam tendrils takes days or

weeks depending on the size of the farm. Hunting, fishing, clearing, preparing, cooking of foods, pounding of foo-foo are all activities that keep one alert. These busy schedules of our traditional people produce physically healthy body. Other benefits include:

- bones are strong due to high calcium content of the foods.
- assist to prevent some kind of heart diseases.
- improve blood sugar to effect diabetes control.
- reduce the risk of developing high blood pressure
- assist elders to be strong and reduce the risk of falling sick.
- activities reduce depression and anxiety. (CINE, 1997)

## **2.9 Traditional Indigenous Food as it Relates to Life and Health**

Proper food and good nutrition are essential for survival, physical growth, mental development, performance and productivity, health and well-being (WHO, 2000).

Nutritional well-being depends upon four main factors: food, care, health and environment. Malnutrition on the other hand, is associated with poverty, high population density, inadequate access to sanitary and health facilities (WHO, 2000).

Some of the plants have nutritional, medicinal or even economic potentials. Roots and tubers are rich in proteins. Carbohydrate (e.g. yams, cocoyam and cassava) serve as foods and when supplemented with other cereals (*Oryza sativa*, *Zea mays*) are used as medicine.

In traditional Nigerian society, families cultivate starchy roots and tubers, cereals, legumes, fruits and vegetables. These constitute the family food basket, supplemented occasionally with animal foods. Traditional food resources could make substantial contribution to adequate nutritional needs of the population, especially the low income groups and particularly at times of seasonal scarcity (Ene-Obong, 1992). It is necessary to identify these traditional foods that could promote and improve good health of individuals in the community.

These traditional foods have not been fully exploited. The reasons include: reduced density of species and available harvesting areas, restricted harvesting in accessible areas, time and energy limitation for traditional harvesting. Interruption of knowledge transfer to the youth due to employment of adult, leads to a gradual loss of this knowledge and consequently, the younger generation become exposed to some disease conditions due to wrong food habits. Acceptability of new food products as a

result of media and social contact, for example, the use of some snacks that do not have nutritional values (Corpuz, 1999). Diabetes is an emerging disease among many indigenous people of the world. In some societies, it is regarded as an epidemic. This is due to the flooding of our market with mechanized foods (Youn, 1991). These processed foods were associated with poor micronutrient intake and the development of chronic disease (FAO, 2003).

However, in a research conducted by the Centre for Indigenous People's Nutrition and Environment (CINE, 1997), traditional foods were consumed frequently and they include a large variety of species. They also stated that traditional foods provide economic benefits to families. Some subjects stated that they would not be able to afford all their food needs, if they were required to buy it from the stores. Majority of subjects observed that harvesting and using traditional foods by the family provide many benefits, such as improved physical fitness and good health and as a way for adults to model responsibilities for their children (CINE, 1997).

### **2.9.1 Labour Shortage and Other Factors**

Farmers in the study area identify limited labour as a major constraint to increased productivity. The farming population is ageing because the young people have gone to school. This leads to a higher cost of labour and a reduced in returns to the farmers. Many are no longer willing to produce. The absence of credit facility and high interest rates,

limit the size of investment the farmer can make in farming. This also hinders much of the farm work in both communities.

The dependence on natural rainfall in particular and other climatic variables, considerably hinder the performance of crops. Also crop failure and a drastic reduction in output are often due to poor weather conditions or late rains or even prolonged rainfall. It is common among the farmers to base the timing of their production activity on "when the rain comes." Scheduling of production is very precarious. Continuous cultivation in the farm may lead to breakdown in soil fertility, accumulation of weeds, pests and diseases with adverse effect on sustainability of production. The marketing system in most areas highly favours the middlemen. These are to the detriment of the farmer who gets little for his investment. This equally reduces productivity.

## **2.10 Constraint to the Use of Indigenous Foods**

### **2.10.1 Contaminants in Traditional Foods:**

Contaminants are substances found in places where they should not be found. Starting from bush clearing to planting, harvesting and storage, cooking, dishing out and consumption are all influenced by physical, biological and social environment. At any stage of the process, foods can be contaminated. Habits are developed due to culture and ignorance (Kuhnlein and Chan, 2000).

The soil contains the greatest variety of microorganisms of any source of contamination. These organisms thrive more on fertile soils ready to contaminate the surfaces of the growing plant. Soil dust whipped up by air currents, and soil particles are carried by running water to contaminate foods. Eggs of larva of helminthes and nematodes are ubiquitous in untreated water and under cooked foods.

### **2.10.2 Lack of Transportation and Storage Facilities**

Food production occurs during rainy season when foods are abundant and cheap, for example yam (*Dioscorea rotundata*), Sweet potato (*Ipomea batatas*), oil bean Seed (*Pentaclethra macrophylla*), Cassava (*Manihot esculenta*), maize (*Zea mays*), plantain (*Musa paradisepca*), cocoyam (*Colocasia esculentus*), rice (*Oryza saliva*), groundnut (*Archis hypogea*) or bambara nut (*Voandezeia subterranea*), cowpea (*Vigna unguicuiata*). Also available and

affordable are vegetables like: achalla oyibo (*Cympogon*), Aluluisis (*Ocimum gratissimum*), ulumiri (*Spathodea campanulata*), uda (*Xylopi aethopicum*).

However, during the dry season when harvesting is already completed, food crops become scarce and costly. This is partly because hot weather favours food spoilage. There is also the problem of inadequate transportation and storage facilities. Most roads are bad and unmotorable leading to difficulties in transporting food items to the town/urban areas when they are in season.

People use traditional preservation and storage systems such as sun drying and salting. There is no means of storage of nuts and vegetables. These foods are very scarce during dry season. The few that are available in the market are very costly.

### **2.10.3 Accidents when Harvesting Traditional Food:**

Poor mechanized agriculture, leads to various kinds of accidents. These vary from machete cuts on hands or legs, one's leg or eyes could also be punctured by a stick.

During the harmatan, a lot of farmers are faced with harsh windy weather and a lot of dust that precipitates eye problems. Some indigenous farmers get drowned due to broken bridges on their way to and from their farms. Indeed, they are faced with life threatening situations. However, people continue to farm. Improved knowledge and experience would reduce these risks.

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.1 Area of Study**

This survey was carried out in one of the Igbo culture areas, (Abia State), in Eastern Nigeria. The survey communities included Ohiya and Ohuhu rural areas of Umuahia town in Abia State, Nigeria. Umuahia is the capital of Abia State. It is within the rain forest zone, deep in the Igbo heart land and inhabited completely by the Igbo, except for a few immigrants and temporary visitors. The geographical features are responsible for subsistent agriculture, which is the major occupation. It has a lot of adjoining roads leading to other states, such as, Imo and Cross River states. There are federal and state ministries, hospitals, schools, banks and various establishments in Umuahia town.

Ohiya and Ohuhu are communities in Umuahia South Local Government area of the State. Ohiya and Ohuhu have two major seasons: dry and wet seasons. Most of the planting are done during the wet season.

The majority of the inhabitants are civil servants who work in government establishments. However, a larger proportion are farmers whose major food products are

Cassava, (*Manihot esculenta*), yam (*Dioscorea spp*), maize (*Zea mays*), plantain (*Musa paradisaca*). Vegetables such as fluted pumpkin (*Telferia occidentalis*) and African spinach (*Amamntus hybndus*); other food crops are also grown there.

The communities have one daily market, the others hold once in four days. They have pipe borne water in the town and in the communities. They use the streams when the taps are not running. The whole community has electricity. The predominant religion is Christianity. Their kingship runs in a family known as Umueze (The Royal family). The present chief of the Ohiya community is Eze Ohanyere I of Ohiya/Ohuhu.

### **3.2 Sample Size**

A sample of two hundred (200) households were selected from the two communities, used for the study. Each household was randomly selected from a list of the households in the communities generated for the purpose of the study. Subjects were selected from the two communities in Abia State which make up 400 households.

### **3.3 Study Population**

The study population is the total household in Abia State but specifically two communities were used: Ohuhu and Ohiya that has four hundred households.

### **3.4 Approach to the People**

There was a personal visit to the traditional rulers in the communities. A letter of introduction was written to the chiefs of the two communities used for the study. The chiefs in turn informed the members of his cabinet of the intended study and its different stages. He was required to solicit cooperation from the communities as well as researcher at every stage.

### **3.5 Training of Personnel**

Two people were trained to work in each community during the survey. These assistants were selected from among or within the indigenes of the communities. They were expected to possess school certificate or Bachelor's degree. They were taught how to fill out the questionnaires as well as how to obtain anthropometric measurements and weighed food intake of the subjects. ,

## **Data Collection**

### **3.5.1 Key Informant Interviews**

The chiefs of the communities and members of their cabinets were the major informants. They gave the researcher information concerning the structure of the town.

They guided the researcher on choices of knowledgeable subjects for focus group discussion and other information pertinent to the study.

### **3.5.2 Focus Group Discussion (FGD):**

A focus group discussion comprises a small group of subjects of the same age and gender knowledgeable in a specific locality (Blum *et al*, 1997). The chiefs of the communities assisted the researcher to select subjects (men and women), who were capable to provide accurate information to the researcher.

A focus group guide was developed for use during discussions. Different issues were raised and discussed on the following topics.

- the foods that are consumed in the community
- the foods consumed seasonally by mothers and children.
- the food scarcely used or currently used and the reasons for less use.
- pattern of food harvest.

### **3.6 Individual Interviews:**

Individual households were asked questions on infant feeding methods and complementary food practices. Traditional food list and short list of foods suspected to be rich sources of micronutrients, developed from the previous steps for individual interviews were used. The purpose is to:

- (a) Learn how these foods are used
- (b) The meaning and other attributes attached to them.

#### **3.6.1 Card Sort:**

The researcher went with pictures of various traditional foods taken from a local market. These pictures were taken with the sellers permission. The pictures were so many (between 50-100 photo cards) and represented various food nutrients such as; protein, carbohydrates, vitamins, mineral, fat and oil and water. The cards were spread on the table. The focus group was told to come and pick these cards, and arrange them according to their food nutrients or groups or what the food in each card gave to the body. The aim was to understand how people classified and grouped foods according to the traditional food list and their reasons for the classifications. Numbers were written behind

the pictures for identification. The number of foods in a particular group was recorded. The reason for the grouping was recorded (Blum *et al*, 1997).

### 3.6.2 Questionnaire

Structured and validated questionnaires developed by the Global Health Research group from Canada and modified to the community setting was used to collect information on the traditional food list. Scores on the question ranges from 1-5.

|         |   |                         |
|---------|---|-------------------------|
| Score 1 | - | Very much disliked food |
| Score 2 | - | Not liked               |
| Score 3 | - | Indifferent             |
| Score 4 | - | Liked                   |
| Score 5 | - | Very well liked food.   |

Micronutrient rich foods for infants and children. Each of the short listed key micronutrients rich foods was used to obtain information from mothers on particular attributes for introduction of complementary foods during the first 2 years or how these foods were useful to children between 2-12 years.

**Infant food history:** The mother was asked about a particular infant in her care, the kind and duration of milk feeding given to the child and the introduction of complementary foods as well as the quantity consumed and frequency of intake.

- A 24 hour recall

In each household, a 24 hour recall was conducted for the mother and a child within one week. The aim was to understand the foods commonly used by the household, the source of foods such as quantities of these foods consumed and the ingredients used to prepare the foods.

- Food frequency interviews for key micronutrient rich foods were carried out in the same household. The mothers and children were interviewed on the frequency of consumption of the micronutrient rich foods and the quantity of these foods consumed by their households.

## 3.7 Anthropometry

### 3.7.1 Weight:

Anthropometric measurements was done as the subjects stood on the salter scale platform (CMS Ltd London), without touching anything. Shoes and heavy clothing were

removed. Readings were taken to the nearest 0.1kg. Care was taken not to weigh an individual immediately after a full meal (WHO, 1983).

### 3.7.2 Height

The subjects stood without shoes on a horizontal platform with feet parallel to each other. The heels, buttocks, shoulders and back of the head were made to touch the upright part of the microtoise height measure meter rule. The head was held erect in the same horizontal plane. The arms were kept hanging by the sides. Then the headpiece was gently lowered to make contact with the head while crushing the hair.

Readings were taken to the nearest 0.5cm (WHO, 1999; Lohman *et al*, 1998).

### 3.8 Weighed Food Intake:

A 2-days weighed food intake was conducted on children and mothers in ten out of the hundred households in each community to estimate the actual quantities of food consumed by both children and mothers. All raw ingredients used in preparing meals for the selected household were weighed and recorded separately. The empty pot used in cooking the food was weighed. After cooking, the total weight of the food cooked was taken. The portions for mothers and the children who were used for 24-hours recall were weighed as well as the leftovers. With these values, it was possible to calculate the nutrient intake of the respondents using food composition table. Meals and snacks consumed outside the home were estimated and their nutrient contents calculated.

### 3.9 Nutrient Analysis of Traditional Foods:

A taxonomist reviewed the list of foods found in the traditional food list. If there were any items in the list that he did not recognize by common name a sample of the food item in its natural environment was collected for further investigations. If the taxonomist still did not recognize the item, a herbarium sample of the item was collected and a sample for analysis. These samples were sent to a laboratory for analysis using AOAC, (2005), procedures for food analysis.

**Protein:** Protein from both plant and animal sources were determined by the Kjeldahl method which determines the amount of nitrogen in the sample. This was subsequently multiplied by the protein conversion factor of 6.25 to get the protein content of the food samples.

**Fat:** Fat was determined by extraction using soxhiet extractor. Fat was determined using soxhiet extractor to extract the total fat with organic solvent. The solvent was allowed to evaporate and the residue weighed.

**Moisture:** Moisture was determined by first weighing the sample and drying in an oven after which it was reweighed. Moisture was calculated from the loss of weight.

**Ash:** The ash content was determined by igniting a weighed portion of a dried sample in a muffle furnace at 525-550°C. The remaining residue was the ash.

**Dietary fibre:** First of all, the sample was treated with enzymes to digest protein and starch. The residue was reweighed, protein and ash were subtracted from the residue to obtain fiber value.

Total carbohydrate was computed by subtracting the percentages of moisture, protein, total lipid and ash from 100%. Digestible carbohydrate was computed by subtracting dietary fiber.

**Mineral:** Mineral content was measured using atomic absorption spectrophotometer. Samples were first prepared by dry ashing.

**Vitamin C:** Ascorbic acid content was determined using a high performance liquid chromatography (HPLC).

**Vitamin A and Carotene:** Were determined using HPLC and taking precautions not to expose the samples to air, light, acid and heat to prevent oxidation.

### 3.10 Analysis of Data from the Questionnaire

Data from the questionnaire were analyzed using a computer programme ("Statistical Package for Social Sciences (SPSS)" version 12). The analysis included frequency distribution, percentages, means and correlations. Results of the weighed food intake calculations were presented as percentages of the recommended daily intake of FAO/WHO/UNU(1985).

Data from anthropometric measurements were analyzed using National Centre for Health Statistics (NCHS), (1976) standards of reference for children. The indicators of nutritional status were used to assess the subjects to find out the level of stunting, wasting, underweight, overweight and normal children in the communities.

## **CHAPTER FOUR**

### **RESULTS**

#### **4.1 Focus Group Discussion (FGD)**

During the FGD, it was observed that the major occupation of men was farming, while the women cultivated cocoyams and vegetables. Men cultivate yam on several hectares of land. The women in turn plant cocoyam and vegetables in these farm fields as intercrops. Traditionally, the men harvest yam into their bans for both sale and consumption. At lunch time, the men give yam to their wives enough for the family (for the married couples). The single men also give yam for lunch, either to their mothers or sisters.

Ji-igwe (yam) is especially and traditionally cooked and consumed during festivals in the two communities. Less than half of the yam produced is consumed; another portion is reserved for next planting season and a third (1/3) is sold for cash. The cash realized is used to solve other problems such as school fees, health issues and other social obligations.

Cocoyams and sweet potatoes are solely cultivated and harvested by the women for family consumption. According to Nwagbo *et al* (1987), cocoyam is consumed in the

family when cassava and yam are in short supply. Both communities based their food supply and consumption on cereals and tubers (Okeke, 2001).

#### 4.1.1 Preference of Traditional Foods to Modern Foods

Both communities prefer indigenous foods that have more nutrients to "modern/market" foods cultivated through mechanized farming. They believe that the consumption of indigenous foods prolongs life more than foods produced through mechanized cultivation.

**Table 1: Commonly consumed foods by adults and children**

| Local Names                   | Types | Scientific Names                              | Brief Description                                                                                                                                                                                                                                                                    |
|-------------------------------|-------|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| White yam                     |       | <i>Discorea rotundata</i>                     | Yam mainly used as staple but the peels could be relished by livestock. It tolerates a temperature of 25-30°C, high sunshine and evenly distributed rainfall of 1000 - 1750mm. Cultivation period is May among people in upland. It is also cultivated in March in river-rine areas. |
| Yellow yam                    |       | <i>Discorea cayenensis</i>                    |                                                                                                                                                                                                                                                                                      |
| Water yam                     |       | <i>Discorea alata</i>                         |                                                                                                                                                                                                                                                                                      |
| Aerial yam                    |       | <i>Discorea bitlbifera</i>                    |                                                                                                                                                                                                                                                                                      |
| Trifoliate yam                |       | <i>Discorea dumentorium</i>                   |                                                                                                                                                                                                                                                                                      |
| Chinese yam                   |       | <i>Discorea prehensilis</i>                   |                                                                                                                                                                                                                                                                                      |
| Cocoyam                       |       | <i>Colocasia esculenta</i>                    |                                                                                                                                                                                                                                                                                      |
| Cassava                       |       | <i>Manihot esculenta</i>                      | Stem cutting is used in propagation. Stem of medium length is planted by either burying 3/4 of the cutting at an angle of about 45°. Planting is between March and October for early planting while November - December for late planting.                                           |
| Rice (pointed and triangular) |       | <i>Oryza saliva</i><br><i>Oryza glaberima</i> | This is planted between April and May while second planting takes place between August and September. It requires rainfall of 1500-2000mm to produce good                                                                                                                            |

yield.

|           |                        |                                                                                                                         |
|-----------|------------------------|-------------------------------------------------------------------------------------------------------------------------|
| Maize     | <i>Zea mays</i>        | Time of planting is April. Late planting takes place in August or September. It requires rainfall of 750 - 1500mm.      |
| Groundnut | <i>Arachia hypogea</i> | It is usually planted between March and May. Planting should not exceed middle of May. It requires 750-1250mm rainfall. |

Table one shows that adults consume foods based on a mixture of tubers, roots, animals, fish, prepared with cultivated and wild vegetables.

On the other hand, children consume more of rice, mashed yam, ripe plantain, fish, mashed potatoes, baked bean cake, fried bean cake, mashed beans, bread fruit.

#### **4.1.2 Cultural and Health Attributes of Some Traditional Foods According to Focus Group Discussion**

Some yams are consumed in the communities because of their medicinal and prestigious benefits. Water yam, trifoliate yam and unripe plantain are traditionally consumed in both communities for treatment of diabetics mellitus. White yam is consumed during new yam festivals because it is most available and prestigious. On the other hand, stem climbing yams contain alcohol and when consumed, it produces a sedative effect.

In the communities some animals, cultivated and wild vegetables serve as accompaniments of various dishes. Roasted crab and deep green vegetables are used as blood builders. *Cymbogon citrate* (achara) is used as a source of roughage. Bitter-kola (*Garcina Cola*) softens and clears cough, drives away snakes, cures heart problems and

treats infants with colicky abdomen. Snail strengthens manhood, while snail faeces cures palpitation of heart. Snail faeces mixed with water, when dropped into the eyes cures eye trouble. Rice water stops diarrhea. These are some of the attributes ascribed to our traditional foods.

#### **4.1.3 Traditional Belief about Certain Foods Consumed in these Communities**

Fresh corn, snail, eggs and beans are believed to cause catarrh and cough among children, dropping of saliva, stealing, stomach discomfort and flatulence respectively.

#### **4.1.4 Extinct Traditional Foods**

Bush rat, fish, termites, trifoliate yam and some species of cocoyam are on the verge of extinction. The two communities rely on domestic animals as well as animal products as their source of meat. This is because fisher men had migrated to urban areas in quest of white collar jobs. Termites have completely gone extinct. Grass cutters also are on the verge of extinct.

#### **4.1.5 Food Related Diseases among the Communities**

Diabetes mellitus, hypertension, eye and stomach problems were all associated with consumption of sugary food, stressful thinking, over crying and consumption of inadequate diets. Consumption of foods rich in fats and oil were associated with malaria attacks.

#### **4.1.6 Leisure Time Activities**

The people observe that the days were gone when villagers gathered at village squares mostly during moon light nights for folktales. Television and movies at home have replaced the good old folktales.

#### **4.1.7 Degree of Consumption and Family Size**

The consumption of traditional foods has been replaced by a consumption of commercially prepared and stored foods. Family size has declined. This is because many have changed their attitudes towards having many children. Moreover, agriculture has lost its position as the main stay of the nation's economy.

Table 2a shows common dishes consumed by indigenous people of Ohiya and Ohuhu which are Jollof rice and beans, maize, cassava foofoo, cassava and corn foofoo, yam pottage, beans, oha soup, gari and okro soup. The ingredient and method of food preparations are shown on the table.

**Table 2a: Common dishes consumed by indigenous people of Ohiya and Ohuhu communities and methods of food preparation.**

| <b>Common/<br/>Local Names</b>                             | <b>Scientific<br/>Names</b>                               | <b>Form<br/>used</b> | <b>ingredients</b>                                                                                                                                                           | <b>Method of Preparation</b>                                                                                                                                                                                                                           |
|------------------------------------------------------------|-----------------------------------------------------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Jollof Rice<br>and Beans<br>(Osikapa na agwa<br>Igbo)      | <i>Oryza Saliva</i><br><i>Vigna</i><br><i>ungutculata</i> | Seed/dry             | 2 cups of Rice<br>1 cup of beans<br>1 teaspoon of pepper<br>1 tablespoon of palm oil salt<br>to taste<br>Water and magi and tomatoes<br>(1 small sized tin) and<br>crayfish. | Remove small stones from beans<br>and rice; wash beans and boil for<br>about 30 minutes.<br>Add Rice, and cook for another<br>20-25 mins.<br>Add pepper, salt, magi, crayfish,<br>onions, palm oil and boil until<br>cooked.<br>Served with vegetable. |
| Maize and<br>Cassava Foo-<br>foo/nri Akpu na<br>Oka (Igbo) | <i>Zea mays</i> and<br><i>Manihot</i><br><i>esculenta</i> | Flour/dried          | 1 cup of maize flour<br>2 cups of cassava flour, oil<br>and water as needed.                                                                                                 | Add maize flour into boiling<br>water and oil until half cooked.<br>Add cassava flour and cook<br>slowly until cooked allow to cool<br>and serve with any type of soup<br>of choice.                                                                   |

|                                              |                         |              |                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------|-------------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Yam pottage Ji<br>awai/ji nmirioku<br>(Igbo) | Discorea<br>rutundata   |              | 1 tuber of yam, 1 tablespoon<br>of palm oil, 1 teaspoon of<br>pepper, 1 small onion, 15g<br>vegetable (green) salt to taste,<br>1 teaspoon of crayfish                                               | Peel yam, cut into small pieces<br>and wash, put into a pot and boil<br>for 1 minute, add all the<br>ingredients. When cooked, serve<br>warm.                                                                                                                                                                                          |
| Ofe Oha                                      | Pterocarpus<br>soyauxii | Fresh leaves | 100g oha leaves, 180g<br>smoked fish,<br>¼ cup of palm oil, 2<br>teaspoons of achi (ground) or<br>4 corm of cocoyam,<br>½ cup of egusi (ground)<br>1 teaspoon of dry pepper<br>Water, salt to taste. | Bring water to boil, add fish boil<br>for 15 minutes. Add palm oil<br>allow to boil. Add egusi, achi<br>powder or cooked pounded<br>cocoyam for thickening. Stir very<br>well, added crayfish, pepper and<br>salt. Pick and wash oha leaves.<br>Shred and add. Cook for 5<br>minutes and serve with cassava<br>foo foo or pounded yam. |

**Table 2a: Common dishes consumed by indigenous people of Ohiya and Ohuhu communities and methods of food preparation, (continued)**

| Common/<br>Local Names              | Scientific<br>Names          | Form<br>used | ingredients                                                                                                                    | Method of Preparation                                                                                                                                                                                                                                                                                                           |
|-------------------------------------|------------------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fermented<br>cassava<br>Akpu (Igbo) | <i>Manihot<br/>esculenta</i> | Tuber/fresh  | Fresh cassava and water                                                                                                        | Peel, wash fresh cassava and put<br>in a household tub or earthen<br>ware pot. Allow to ferment. Put<br>the pulpy mass in water, sieve the<br>fermented cassava and pass<br>excess water, pour into cloth bag<br>and squeeze to expel excess<br>water. Boil water, put in the<br>rolled cassava balls for 10mins.<br>and pound. |
| Beans/Agwa<br>(Igbo)                | Vigna<br>Ungiculata          | Seed/dry     | Beans, 1 table spoon<br>of Remove small stones<br>from beans<br>crayfish, salt to<br>Taste, water, table spoon of<br>palm oil. | Remove small stones from beans<br>and wash,<br>put in a pot of water and boil for<br>30 minutes<br>add crayfish, palm oil, salt to<br>taste and serve                                                                                                                                                                           |

hot or cold.

|                         |                                                       |                                                |                                                                                                                                                               |                                                                                                                                                                                                                           |
|-------------------------|-------------------------------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Garri/Okro soup         | Manihot<br>esculenta<br>Abelmoschus<br>esculenta      | Processed<br>cassava tuber<br>and okro<br>soup | Garri, hot water, 1 tablespoon<br>of palm oil, 1 teaspoon<br>crayfish, 1 teaspoon of<br>pepper, 1 small head of onion,<br>salt to taste<br>20 grammes of okro | Boil water in a pot add pepper.<br>Add crayfish and meat if<br>available, boil or 20-30 minutes<br>add okro and vegetables and boil<br>for 2-5 minutes and serve with<br>prepared garri or foo-foo either<br>hot or cold. |
| Akpu and Achara<br>soup | Manihot<br>esculenta and<br>cymbogon<br>citratum soup | Manihot<br>paste<br>cymbogon<br>leaves         | Akpu, achara, meat, fish, 1<br>teaspoon of thickener, 1<br>teaspoon of pepper, magi, 1<br>teaspoon of oil and water                                           | Boil meat until ½ cooked pour<br>teaspoon of crayfish pepper and<br>thickener and lastly achara,<br>vegetable oil and salt to taste.<br>Boil together few minutes and<br>serve hot with cassava foo - foo.                |

**Table 2a: Common dishes consumed by indigenous people of Ohiya and Ohuhu communities and methods of food preparation, (continued)**

| Common/<br>Local Names      | Scientific<br>Names                                                 | Form<br>used                                     | ingredients                                                                                                                                                              | Method of Preparation                                                                                                                                                                                                                                                                                                                        |
|-----------------------------|---------------------------------------------------------------------|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ogbono/okro<br>soup         | <i>Irvingia and<br/>gabonensis</i>                                  | Fresh okro<br>fruit and<br>ogbono seed<br>(Igbo) | 20g African mango, water,<br>salt to taste, ¼ cup of oil, 3g<br>of okpei, 1 teaspoon of<br>pepper, 10g of crayfish, 30g<br>of vegetable, 10g of okro,<br>100g fish/meat. | Bring water to boil, add ground<br>African mango, crayfish, magi,<br>seasoning, pepper, onions, palm<br>oil, mix thoroughly. Add dry fish<br>and meat already cooked. Add<br>salt, okro and <i>Telferia</i> or<br><i>celisiaargentina</i> and allow to boil<br>until cooked. Okro soup (only<br>chopped okro is used) serve with<br>foo foo. |
| “Oha” or<br>“Nturukpa” soup | <i>Pterocarpus<br/>Soyauxii or<br/>Pterocarpus<br/>Stanlinoides</i> | Oha leaves<br>or Nturukpa<br>leaves (Igbo)       | 100g nturukpa leaves, 180g<br>smoked fish<br>¼ cup of palm oil, 2 teaspoon<br>of achi (ground) or 2 seeds of<br>cocoyam,                                                 | Bring water to boil and add fish,<br>boil for 15 minutes. Add palm<br>oil, allow to boil, add egusi, achi<br>powder or cooked and pounded<br>cocoyam thickener, stir very                                                                                                                                                                    |

|                                                                                                                              |                                                                                                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1/2 cup of egusi, 2 tablespoon<br/>op crayfish (ground), 1<br/>tablespoon of dry pepper,<br/>water and salt to taste.</p> | <p>well. Add crayfish, pepper and<br/>salt. Pick and wash nturukpa<br/>leaves shred and add. Add salt to<br/>taste and serve with cassava<br/>foofoo and pounded yam.</p> |
|------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Table 2b shows some breakfast dishes among indigenous people of Ohiya and Ohuhu communities which are pap and milk (corn gruel and milk), plantain, moi moi oka (*Corn cake*), beans and yam, beans and plantain and ukwa (*Breadfruit*). The ingredient and method of food preparations are shown on the table.

**Table 2b: Some breakfast dishes among indigenous people of Ohiya and Ohuhu communities of Abia State.**

| <b>Common/<br/>Local Names</b>                             | <b>Scientific<br/>Names</b> | <b>Form<br/>used</b>      | <b>ingredients</b>                                                                                   | <b>Method of Preparation</b>                                                                                                                                                         |
|------------------------------------------------------------|-----------------------------|---------------------------|------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pap and milk<br>(Akamu) Igbo<br>(Beancake) Akara<br>(Igbo) | <i>Vigna spp</i>            | Maize paste<br>Bean paste | Water, maize paste, milk,<br>sugar, bean Cake (akara) Igbo                                           | Dissolve maize, paste in cold<br>water, pour hot boiling water into<br>it and stir to form semi solid<br>consistency. Add liquid milk and<br>sugar to taste and serve with<br>akara. |
| Plantain<br>Ogede<br>(Igbo)                                | <i>Musa<br/>paradisaca</i>  | Fresh fruit               | Water, plantain, 1 teaspoon of<br>crayfish, 1 teaspoon of<br>pepper, onions, magi, salt to<br>taste. | Peel the plantain and cut into<br>small pieces and boil. Add<br>crayfish, pepper, magi and salt to<br>taste. Boil until it is cooked.<br>Serve hot or cold.                          |
| Moi moi Oka                                                | <i>Zea mays</i>             | Seed of<br>maize          | Maize paste, crayfish, pepper,<br>onions magi, salt.                                                 | Soak beans in water and wash off<br>husk. Grind with machine to<br>form paste. Add pepper, crayfish,<br>onions, magi, salt to taste etc;<br>turn all together and wrap in            |

|                                                       |                                                     |                                           |                                                                                                                                  |                                                                                                                                                 |
|-------------------------------------------------------|-----------------------------------------------------|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                       |                                                     |                                           |                                                                                                                                  | plantain/banana leaves and steam<br>cook for 30-45 minutes serve<br>with tea, pap or soaked Garri.                                              |
| Beans and yam<br>Ji na agwa<br>(Igbo)                 | <i>Vigna spp</i><br><i>Dioscorea spp</i>            | Dry beans<br>Fresh yam                    | Yam, 1 teaspoon of pepper,<br>teaspoon of oil, onions, magi,<br>salt to taste. 2 cups of beans.                                  | Peel yam, cut into small pieces<br>and add into beans that has<br>boiled for 30 mins, cook for 25-<br>30 minutes. Add the ingredients.          |
| Beans and<br>plantain<br>(Agwa na<br>Ogede)<br>(Igbo) | <i>Vigna spp</i><br><i>Musa</i><br><i>paradisca</i> | Dry bean<br>seed and<br>Fresh<br>plantain | Plantain 1 teaspoon of<br>pepper, 1 teaspoon of<br>crayfish, 1 teaspoon of oil,<br>small head of onions, magi,<br>salt to taste. | Peel plantain, cut into small<br>pieces and add into beans that<br>had boiled for 30 minutes cook<br>until it has cooked. Serve hot or<br>cold. |
| Breadfruit<br>Ukwa<br>(Igbo)                          | <i>Treculia</i><br><i>africana</i>                  | Seed (fresh)                              | Ukwa, 1 teaspoon of oil, 1<br>teaspoon of crayfish, taste salt<br>to taste.                                                      | Boil Ukwa for 20 minutes add<br>salt to magi, oil and serve hot.                                                                                |

Table 2c shows that white corn and coconut, pineapple, fresh African yam beans, pear and garri and groundnut are among the common in-between meals consumed by the people of Ohiya and Ohuhu communities. Their recipes and methods of food preparations are shown on the table.

**Table 2c: Common in between meals consumed among indigenous communities under study.**

| <b>Common/<br/>Local Names</b>                  | <b>Scientific<br/>Names</b>                                            | <b>Form<br/>used</b>                                                      | <b>ingredients</b>           | <b>Method of Preparation</b>                                                                                                   |
|-------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------|------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| White corn and<br>coconut                       | <i>Zea mays</i><br><i>Cocos nucifera</i>                               | Cob of corn                                                               | Water, corn, coconut         | Boil fresh corn until it is tender<br>and eat with coconut. Or roast<br>fresh corn until it is cooked and<br>eat with coconut. |
| Pineapple                                       | <i>Anoneas</i><br><i>imircata</i>                                      | Fresh<br>pineapple<br>fruit                                               | Fresh pineapple fruit        | Wash with water, peel the back<br>and cut the flesh into pieces and<br>eat.                                                    |
| Fresh African<br>yam beans<br>(odudu)<br>(Igbo) | <i>Sphenostylis</i><br><i>stenocarpa</i>                               | Young<br>odudu seed                                                       | Young odudu seed             | Wash, cook, until it is cooked<br>remove the husk and eat.                                                                     |
| Pear and Garri                                  | <i>Manihot</i><br><i>esculenta</i><br><i>Daryodes</i><br><i>edulis</i> | Processed/<br>Dry Dry<br>manihot<br>esculenta and<br>fresh pear<br>fruit. | Garri, pear, sugar and water | Put garri in a clean bowl, add<br>water and sugar to taste and serve<br>with pears.                                            |

|           |                        |                        |                     |                                                                             |
|-----------|------------------------|------------------------|---------------------|-----------------------------------------------------------------------------|
| Groundnut | <i>Arachis hypogea</i> | Fresh groundnut seeds. | Groundnut and water | Fresh groundnut is boiled and eaten like that. With palm kernel or coconut. |
|-----------|------------------------|------------------------|---------------------|-----------------------------------------------------------------------------|

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## 4.2 Dietary Intake

Table 3a shows that 36% infants had breast milk for breakfast while 64% did not. Thirty-four percent of them had it as lunch whereas 66% did not. Thirty percent infants took breast milk for dinner, while 70% did not.

Twenty-eight 28% took akpu (*Cassava foofoo*) and soup for breakfast, 20% took it for lunch while 52% had akpu (*Cassava foofoo*) for dinner. One hundred infants 100% took bread and tea only in the morning. Forty-two percent infants were given pap (maize gruel) as breakfast while 28% had it as lunch and the remaining 30% had it as dinner. Artificial milk was given to 50% for breakfast while 50% infants received it as lunch and none as dinner. Moi-moi (*Cowpea cake*) was given to 50% infants as breakfast and 50% had it as lunch and none took it as dinner. Fifty percent infants received moi-moi oka (*Corn cake*) for breakfast while 50% received it for lunch and none for dinner. Fifty percent infants ate pap and beans for breakfast, 25% for lunch and 25% for dinner. Yam and vegetable was eaten by 34% infants as breakfast and 66% took it as lunch.

Twenty-five percent infants were given jollof rice and vegetable as breakfast, 25% also received it as lunch while 50% had it as dinner.

One hundred percent infants had rice and beans as lunch, none had it as breakfast nor dinner. Fifty percent infants had ukwa (*Breadfruit*) and rice as lunch and breakfast

and 50% as dinner and none had it for breakfast. One hundred percent infants had Ede (*Cocoyam*) as lunch and none had it as breakfast and dinner.

Plantain and beans was eaten by 40% infants as lunch, 60% had it as dinner and none as breakfast. Yam and beans was eaten by 50% as lunch, 50% had it as dinner and none as breakfast. Yam porridge was eaten by 100% children as lunch. None had it as dinner and breakfast.

Fifty percent infants were given agidi (*Corn cake*) and stew as breakfast and lunch. None was given to them as dinner.

**Table 3a: 24 hours recall for infant (0-2 years) in Ohuhu community showing types of food taken by infants as breakfast, lunch and dinner.**

| Food                    | Common names                 | Breakfast |     | Lunch |    | Dinner |    |
|-------------------------|------------------------------|-----------|-----|-------|----|--------|----|
|                         |                              | No        | %   | No    | %  | No     | %  |
| Breast milk             |                              | 36        | 36  | 34    | 34 | 40     | 40 |
| Akpu and soup           | <i>Cassava foofoo + soup</i> | 28        | 28  | 20    | 20 | 52     | 52 |
| Tea and bread           |                              | 100       | 100 | -     | -  | -      | -  |
| Pap and Groundnut paste |                              | 42        | 42  | 28    | 28 | 30     | 30 |
| Artificial milk         |                              | 50        | 50  | 50    | 50 | -      | -  |
| Moi moi                 | <i>Cowpea cake</i>           | 50        | 50  | 50    | 50 | -      | -  |
| Moi-moi oka             | <i>Corn cake</i>             | 50        | 50  | 50    | 50 | -      | -  |
| Pap and beans           | <i>Corn gruel + beans</i>    | 50        | 50  | 25    | 25 | 25     | 25 |
| Yam and vegetable       |                              | 34        | 34  | 66    | 66 | -      | -  |
| Rice and vegetable      |                              | 25        | 25  | 25    | 25 | 50     | 50 |
| Agidi + stew            | <i>Corn cake + stew</i>      | 50        | 50  | 50    | 50 | -      | -  |

|                    |                          |   |   |     |     |    |    |
|--------------------|--------------------------|---|---|-----|-----|----|----|
| Rice and beans     |                          | - | - | 100 | 100 | -  | -  |
| Ukwa and Rice      | <i>Breadfruit + rice</i> | - | - | 50  | 50  | 50 | 50 |
| Ede                | <i>Cocoyam</i>           | - | - | 100 | 100 | -  | -  |
| Plantain and beans |                          | - | - | 40  | 40  | 60 | 60 |
| Yam and beans      |                          | - | - | 50  | 50  | 50 | 50 |
| Yam porridge       |                          | - | - | 100 | 100 | -  | -  |

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According to the Table 3b, 40% and 45% children took akpu (*Cassava foofoo*) and soup for their breakfast and dinner respectively while 15% had it for lunch. Seventy percent children had Rice for breakfast. 10% had it for lunch while 20% had it for dinner. Sixty percent children took agidi (*Corn cake*) and stew for breakfast, 25% took agidi (*Corn cake*) and stew for lunch, while 25% took it for dinner. Pap (corn gruel) and beans was taken by 70% of children for breakfast 15% took it for lunch while 15% had it for dinner. Moi moi oka (*Corn cake*) was consumed by 50% children for breakfast, 30% for lunch and 20% of children consumed it at night. Tea and bread was taken by 100% children only in the morning for breakfast. None used it for lunch and dinner. Yam porridge was consumed by 25% for breakfast, 50% children consumed yam porridge for lunch while 25% consumed yam porridge for dinner.

Plantain and beans was taken by 16% children in the morning, 58% took plantain and beans for lunch while 26% had it for dinner. Pap and red oil was taken by 80% children for breakfast, 10% took it for lunch while 10% had it for their dinner. Twenty-five percent of children consumed garri and soup for breakfast, 50% consumed it for lunch while 25% had it for dinner.

Twenty-eight) percent children ate moi moi (*Cowpea cake*) for breakfast, 48% had it for lunch while 25% took it as their dinner. Yam and beans was eaten by 12% for

breakfast, 70% ate yam and beans for lunch and 18% ate it as dinner. One hundred percent children ate beans only in the afternoon. None took it as breakfast and dinner. Ukwa (*Breadfruit*) and vegetable was also taken by 100% children in the afternoon as lunch and none for breakfast and dinner. Ede (*Cocoyam*) and vegetable was taken by 50% children as lunch, 50% as dinner and none as breakfast.

**Table 3b: 24-hour recall for children (2-12 years) in Ohuhu community showing types of food eaten as breakfast, lunch and dinner.**

| Food               | Common names                  | Breakfast |     | Lunch |    | Dinner |    |
|--------------------|-------------------------------|-----------|-----|-------|----|--------|----|
|                    |                               | No        | %   | No    | %  | No     | %  |
| Akpu and soup      | <i>Cassava foo foo + soup</i> | 40        | 40  | 15    | 15 | 45     | 45 |
| Jollof rice        |                               | 70        | 70  | 10    | 10 | 20     | 20 |
| Agidi stew         | <i>Corn cake + stew</i>       | 60        | 60  | 25    | 25 | 15     | 15 |
| Pap and beans      | <i>Corn gruel and beans</i>   | 70        | 70  | 15    | 15 | 15     | 15 |
| Moi moi oka        | <i>Corn cake</i>              | 50        | 50  | 30    | 30 | 20     | 20 |
| Tea and bread      |                               | 100       | 100 | -     | -  | -      | -  |
| Yam porridge       |                               | 25        | 25  | 50    | 50 | 25     | 25 |
| Plantain and beans |                               | 16        | 16  | 58    | 58 | 26     | 26 |
| Pap and red oil    |                               | 80        | 80  | 10    | 10 | 10     | 10 |
| Garri and soup     |                               | 25        | 25  | 50    | 50 | 25     | 25 |
| Moi-moi            | <i>Cowpea cake</i>            | 28        | 28  | 48    | 48 | 24     | 24 |
| Yam and beans      |                               | 12        | 12  | 70    | 70 | 18     | 18 |

|                    |                                 |   |   |     |     |    |    |
|--------------------|---------------------------------|---|---|-----|-----|----|----|
| Beans              |                                 | - | - | 100 | 100 | -  | -  |
|                    |                                 |   | - |     |     |    |    |
| Ukwa and vegetable | <i>Breadfruit and vegetable</i> | - | - | 100 | 100 | -  | -  |
| Ede and vegetable  | <i>Cocoyam and vegetable</i>    | - | - | 50  | 50  | 50 | 50 |

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Table 3c shows that 45% mothers consumed akpu (*Cassava fofofo*) and achalla (*Cymogon citrate*) soup for breakfast, 15% consumed akpu (*Cassava fofofo*) and achalla (*Cymogon citrate*) soup for lunch while 40% ate it for dinner. Twenty-nine percent ate Rice for breakfast, 22% took it for lunch while 49% took it for dinner. 50% took ugba (*Oil bean fruit*) for lunch and dinner respectively while none as breakfast. Tea and bread was taken by 100% mothers in the morning and none for afternoon and dinner. Twenty-five percent mothers ate yam vegetable in the morning for breakfast and 50% took it for lunch while 25% took it for their dinner. Moi moi (*Cowpea cake*) was consumed by 27% mothers in the morning, 40% took it for lunch while 33% had it as dinner. Mothers who took abacha (*Tapioca*) and beans for lunch were 55% and dinner 45%. None took it as breakfast. Mothers who took beans and plantain for breakfast were 16%, lunch 68% and dinner 16%. One hundred percent mothers took beans and pap for their breakfast and none took it for lunch and dinner. Mothers who took garri and soup for breakfast were 40%, 20% for lunch and 40% for dinner. Moi moi oka (*Corn cake*) was eaten by 33% mothers for breakfast, 45% for lunch and 22% for dinner.

Rice and beans was eaten by 20% mothers for breakfast, 70% for lunch and 10% for dinner. Agidi (*Corn cake*) and stew was taken by 12% mothers while 80% mothers had it for lunch and 8% had it for dinner. One hundred 100% mothers drank garri with

groundnut for lunch and none for breakfast and dinner. Twenty 20% mothers ate yam porridge for breakfast, 50% for lunch and 30% for dinner. One hundred 100% mothers consumed ukwa (*Breadfruit*) in the afternoon and none for dinner and breakfast. One hundred mothers took pineapple for lunch and none for breakfast and dinner. Potatoes were eaten by 30% mothers for breakfast, 60% for lunch and 20% for dinner. One hundred 100% mothers took beans for lunch and none for breakfast and dinner. Beans was not used as breakfast and dinner by mothers in Ohuhu but they used it as lunch.

**Table 3c: 24-hour recall for mother in Ohuhu community showing types of food eaten as breakfast, lunch and dinner.**

| Food                  | Common names                  | Breakfast |     | Lunch |    | Dinner |    |
|-----------------------|-------------------------------|-----------|-----|-------|----|--------|----|
|                       |                               | No        | %   | No    | %  | No     | %  |
| Akpu and achalla soup | <i>Cassava foo foo + soup</i> | 45        | 45  | 15    | 15 | 40     | 40 |
|                       | <i>Cymogon citrate</i>        |           |     |       |    |        |    |
| Rice                  |                               | 29        | 29  | 22    | 22 | 49     | 49 |
| Ugba                  | <i>Oil bean</i>               | -         | -   | 50    | 50 | 50     | 50 |
| Tea and bread         |                               | 100       | 100 | -     | -  | -      | -  |
| Yam vegetable         |                               | 25        | 25  | 50    | 50 | 25     | 25 |
| Tea and bread         |                               | 100       | 100 | -     | -  | -      | -  |
| Yam porridge          |                               | 25        | 25  | 50    | 50 | 25     | 25 |
| Moi moi               | <i>Cowpea cake</i>            | 27        | 27  | 40    | 40 | 33     | 33 |
| Abacha and beans      | <i>Tapioca and beans</i>      | -         | -   | 55    | 55 | 45     | 45 |
| Beans and plantain    |                               | 100       | 100 | -     | -  | -      | -  |
| Garri and soup        |                               | 40        | 40  | 20    | 20 | 40     | 40 |

|                              |                         |    |    |     |     |    |    |
|------------------------------|-------------------------|----|----|-----|-----|----|----|
| Moi moi oka                  | <i>Corn cake</i>        | 33 | 33 | 45  | 45  | 22 | 22 |
| Rice and beans               |                         | 20 | 20 | 70  | 70  | 10 | 10 |
| Agidi stew                   | <i>Corn cake + stew</i> | 12 | 12 | 80  | 80  | 8  | 8  |
| Drinking garri and groundnut |                         | -  | -  | 100 | 100 | -  | -  |
| Yam porridge                 |                         | 20 | 20 | 50  | 50  | 30 | 30 |
| Ukwa                         | <i>Breadfruit</i>       | -  | -  | 100 | 100 | -  | -  |
| Pineapple                    |                         | -  | -  | 100 | 100 | -  | -  |
| Potatoes                     |                         | 30 | 30 | 60  | 60  | 10 | 10 |
| Beans                        |                         | -  | -  | 100 | 100 | -  | -  |

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Table 3d shows that 60% infants had pap (corn gruel) for breakfast, 20% as lunch and 20% for dinner. One hundred 100% infants took pap (corn gruel) and beans for breakfast and none for lunch and dinner. Fifty 50% infants received breast milk for breakfast, 20% received it for lunch while 30 received for dinner. Jollof rice was given to 33% infants for breakfast, none for lunch and 67% took it for dinner. Yam with oil was given to 16% for breakfast, 50% for lunch and 34% for dinner. Yam and beans was given to 25% infants for breakfast, 50% for lunch and 25% for dinner. Twelve 12% infants received yam porridge for breakfast, 53% for lunch and 35% received yam porridge for dinner. Soups were given to 10% for breakfast, 45% for lunch and 45% for dinner. One hundred children 100% took ukwa (*Breadfruit*) in the afternoon. None took ukwa (breadfruit) for breakfast and dinner. Agidi (*Corn cake*) and stew was given to one hundred 100% infants for lunch and none for breakfast and dinner. Moi moi (*Cowpea cake*) was given to 20% infants for breakfast, 80% for lunch and none had it for dinner. One hundred 100% had garri for lunch and none for breakfast and dinner. Rice and beans was given to one hundred 100% infants in the afternoon for lunch and none for breakfast and dinner. Mashed plantain was given to 50% for lunch and 50% for dinner, none for breakfast. Beans was given to 100% infants only in the afternoon but none for breakfast and dinner.

**Table 3d: 24-hour recall for infants (0-2 years) in Ohiya community showing types of food taken by infants as breakfast, lunch and dinner.**

| Food           | Common names                | Breakfast |     | Lunch |     | Dinner |    |
|----------------|-----------------------------|-----------|-----|-------|-----|--------|----|
|                |                             | No        | %   | No    | %   | No     | %  |
| Pap            | <i>Corn gruel</i>           | 60        | 60  | 20    | 20  | 20     | 20 |
| Pap and beans  | <i>Corn gruel and beans</i> | 100       | 100 | -     | -   | -      | -  |
| Breast milk    |                             | 50        | 50  | 20    | 20  | 30     | 30 |
| Jollof rice    |                             | 33        | 33  | -     | -   | 67     | 67 |
| Yam and oil    |                             | 16        | 16  | 50    | 50  | 34     | 34 |
| Yam and beans  |                             | 25        | 25  | 50    | 50  | 25     | 25 |
| Yam porridge   |                             | 12        | 12  | 53    | 53  | 35     | 35 |
| Soups          |                             | 10        | 10  | 45    | 45  | 45     | 45 |
| Ukwa           | <i>Breadfruit</i>           | -         | -   | 100   | 100 | -      | -  |
| Agidi stew     | <i>Corn cake and stew</i>   | -         | -   | 100   | 100 | -      | -  |
| Moi moi        | <i>Cowpea cake</i>          | 20        | 20  | 80    | 80  | -      | -  |
| Garri and soup |                             | -         | -   | 100   | 100 | -      | -  |

|                |   |   |     |     |    |    |
|----------------|---|---|-----|-----|----|----|
| Rice and beans | - | - | 100 | 100 | -  | -  |
| Plantain       | - | - | 50  | 50  | 50 | 50 |
| Beans          | - | - | 100 | 100 | -  | -  |

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Table 3e shows that 82% children took agidi (*Corn cake*) and stew for breakfast while 9% had it for lunch and dinner respectively. Akpu (*Cassava foofoo*) and achalla (*Cymogon citrate*) soup was taken by 20% children for breakfast, 47% for lunch and 33% had akpu (*Cassava foofoo*) and achalla (*Cymogon citrate*) soup for dinner. Pap and beans was taken by seventeen 17% children for breakfast, 43% took it for lunch while 40% had it for dinner. Pap (corn gruel) and baked bean cake (*Akara*) was taken by 100% children for breakfast none for lunch and dinner. Yam porridge was taken by 21 % children, 22% had it for lunch while 57% had it as dinner. Sixty 60% children took moi moi (*Cowpea cake*) for their breakfast, 20% took moi moi (*Cowpea cake*) as lunch and dinner respectively. Garri and okazi (*Gongronema latifolium*) soup was taken by 40% children, 20% took it as lunch and 40% took it as dinner. Rice and beans was taken by one hundred children as breakfast and none took it for lunch and dinner.

Tea and bread was taken by 50% children for breakfast, 25% for lunch and 25% had it for dinner. Yam vegetable was taken by 50% children as breakfast and 50% had it for lunch while none had it as dinner. Guinea corn and oha (*Petrocarpus soyauxii*) soup was consumed by 100% for breakfast. Ukwá (*Breadfruit*) and Rice was taken by 100%

children as lunch and none was taken as breakfast and dinner. Yam and beans was taken by 100% children at night. It was neither used as breakfast nor dinner.

**Table 3e: 24-hour recall for children (2-12 years) in Ohiya community showing types of food taken as breakfast, lunch and dinner.**

| Food                  | Common names                              | Breakfast |     | Lunch |    | Dinner |    |
|-----------------------|-------------------------------------------|-----------|-----|-------|----|--------|----|
|                       |                                           | No        | %   | No    | %  | No     | %  |
| Agidi stew            | <i>Corn cake and stew</i>                 | 82        | 82  | 9     | 9  | 9      | 9  |
| Akpu and achalla soup | <i>Cassava foofoo and Cymogon citrate</i> | 20        | 20  | 47    | 47 | 33     | 33 |
| Pap and beans         | <i>Corn gruel and beans</i>               | 17        | 17  | 43    | 43 | 40     | 40 |
| Pap and akara         | <i>Corn gruel and bean cake</i>           | 100       | 100 | -     | -  | -      | -  |
| Yam porridge          |                                           | 21        | 21  | 22    | 22 | 57     | 57 |
| Moi moi               | <i>Cowpea cake</i>                        | 60        | 60  | 20    | 20 | 20     | 20 |
| Garri and okazi soup  | <i>Garri and Gongronema latifolium</i>    | 40        | 40  | 20    | 20 | 40     | 40 |
| Rice and beans        |                                           | 100       | 100 | -     | -  | -      | -  |
| Tea and bread         |                                           | 50        | 50  | 25    | 25 | 25     | 25 |

|                          |                                                       |     |     |     |     |     |     |
|--------------------------|-------------------------------------------------------|-----|-----|-----|-----|-----|-----|
| Yam and vegetable        |                                                       | 50  | 50  | 50  | 50  | -   | -   |
| Guinea corn and oha soup | <i>Guinea corn and</i><br><i>Petrocarpus soyauxii</i> | 100 | 100 | -   | -   | -   | -   |
| Ukwa and rice            | <i>Breadfruit and rice</i>                            | -   | -   | 100 | 100 | -   | -   |
| Yam and beans            |                                                       | -   | -   | -   | -   | 100 | 100 |

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Table 3f shows that 34% mothers recalled that they ate yam porridge for breakfast, 45% for lunch and 21% for dinner. Thirty-four percent mothers took akpu (*Cassava fofofoo*) and okazi (*Gongronema latifolium*) Soup for breakfast, 16% mothers had it as lunch while 50% mothers had it for dinner. Ugba (*Oil bean fruit*) was taken by 50% mothers as lunch while 50% had it as dinner. Agidi (*Corn cake*) and stew was eaten by 15% mothers for breakfast, 48% mothers had it for their lunch while 37% mothers had it as dinner. Pap and beans was taken by 33%, 33% and 34% for breakfast, lunch and dinner respectively. One hundred percent had Jollof rice as lunch, none took it in the morning and at night. Garri and soup was eaten by 100% mothers as lunch. None took it as breakfast and dinner. Ukwa (*Breadfruit*) and vegetable was taken by 50% mothers for their lunch, 50% had it for their dinner and none took it for their breakfast. Yam and beans was eaten by 20% mothers for breakfast, 40% had it for lunch and 40% had it for dinner. Rice and beans was taken by 20% mothers for breakfast, 40% for lunch and 40% had it for their dinner. Yam with vegetable was taken by 25% mothers for breakfast, 50% had it for lunch while 25% had it for their dinner. Groundnut paste and bread was taken by 50%

mothers for breakfast, 50% had it for lunch while none took it at night. One hundred percent mothers drank garri with groundnut for lunch and none for breakfast and dinner.

### 4.3 Consumption of Key Micronutrient Rich Foods

Households were asked questions on the rate of consumption of some micronutrient rich foods. The responses were based on daily, weekly, monthly, yearly rate of consumption.

**Table 3f: 24-hour recall for mothers in Ohiya community showing types of food eaten as breakfast, lunch and dinner.**

| Food                       | Common names                                 | Breakfast |    | Lunch |     | Dinner |    |
|----------------------------|----------------------------------------------|-----------|----|-------|-----|--------|----|
|                            |                                              | No        | %  | No    | %   | No     | %  |
| Yam porridge               |                                              | 34        | 34 | 45    | 45  | 21     | 21 |
| Pounded yam and okazi soup | <i>Pounded yam and Gongronema latifolium</i> | 34        | 34 | 16    | 16  | 50     | 50 |
| Ugba                       | <i>Oil bean fruit</i>                        | -         | -  | 50    | 50  | 50     | 50 |
| Agidi stew                 | <i>Corn cake and stew</i>                    | 15        | 15 | 48    | 48  | 37     | 37 |
| Pap and beans              |                                              | 33        | 33 | 33    | 33  | 34     | 34 |
| Jollof rice                |                                              | -         | -  | 100   | 100 | -      | -  |
| Garri and oha soup         | <i>Garri and Petrucarpus soyauxii</i>        | -         | -  | 100   | 100 | -      | -  |
| Ukwa and vegetable         | <i>Breadfruit and vegetable</i>              | -         | -  | 50    | 50  | 50     | 50 |

|                              |    |    |     |     |    |    |
|------------------------------|----|----|-----|-----|----|----|
| Yam and beans                | 20 | 20 | 50  | 50  | 30 | 30 |
| Rice and beans               | 20 | 20 | 40  | 40  | 40 | 40 |
| Yam and vegetable            | 25 | 25 | 50  | 50  | 25 | 25 |
| Groundnut paste and bread    | 50 | 50 | 50  | 50  | -  | -  |
| Drinking garri and groundnut | -  | -  | 100 | 100 | -  | -  |

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Table 4a shows that 53% respondents consume crayfish daily; 35% weekly; 10% monthly and 2% yearly. Pork meat was eaten by 16% respondents daily; 22% weekly; 48% monthly and 14% yearly. Seven percent respondents consume bush meat on daily basis; 39% on weekly basis; 51% on monthly basis and 3% on yearly basis. Goat meat was eaten by 10% respondents daily; 15% weekly; 10% monthly 65% yearly. Chicken was not taken daily, 23% took it on weekly basis; 50% took it monthly and 27% took it yearly. Twelve percent respondents consumed dried fish daily; 88% consumed it weekly and none for monthly & yearly. Duck was eaten on daily and weekly basis 4% and 96% respectively). Ten percent respondents ate Guava daily; 70% weekly; 8% monthly and 12% yearly. Fourteen percent respondents ate mango daily; 38% took it weekly 32% took mango monthly and 16% yearly. Avacado pears was taken by 8% respondents daily, 60% took it weekly, 24% took it monthly while 8% took it yearly. Ugiri (*Ivringia gabonensis*) was eaten by 7% respondents daily 44% took it weekly; 17% took ugiri (*Ivringia gabonensis*) on monthly basis while 32% took it on yearly basis pineapple was taken by

2% respondents daily; 86% weekly; 10% monthly and 2% yearly. Udara (*Bush berry*) was taken by 7% of respondents, daily; 72% weekly; 5% monthly and 16% yearly. Sour-sop was eaten by 9% respondent daily; 29% took it weekly, 9% took it monthly while 53% took it yearly. Oranges was taken by 8%; 88%, 3% and 1% daily, weekly; monthly and yearly respectively. Pumpkin was taken by 39%; 41%; 15% and 5% daily, weekly monthly and yearly respectively. Cent leave was taken by 14% daily; 68% weekly; 10% monthly and 8% yearly. Mushroom was eaten by 10% respondents daily, 81% weekly; 5% monthly and 4% yearly. Twenty-four percent respondents took tomatoes daily; 36% weekly, 20% monthly and 20% took tomatoes yearly. Forty percent respondents took ugu (*Telfera*) daily; 43% took it weekly; 10% monthly and 7% yearly. Palm oil/fruit was eaten by 5% daily 5% weekly; 17% monthly and 73%. Finally, oil bean was taken by 13% respondents weekly, 33% monthly and 54% yearly. There was no daily consumption.

**Table 4a: Frequency of consumption of key micronutrient rich foods in Ohuhu community of Abia State.**

| Food Groups         | Daily |    | Weekly |    | Monthly |    | Yearly |    | Total |
|---------------------|-------|----|--------|----|---------|----|--------|----|-------|
|                     | No    | %  | No     | %  | No      | %  | No     | %  | %     |
| <b>Animal foods</b> |       |    |        |    |         |    |        |    |       |
| Crayfish            | 53    | 53 | 35     | 35 | 10      | 10 | 2      | 2  | 100   |
| Pork meat           | 16    | 16 | 22     | 22 | 48      | 48 | 14     | 14 | 100   |
| Bush meat           | 7     | 7  | 39     | 39 | 51      | 51 | 3      | 3  | 100   |
| Egg                 | 24    | 24 | 10     | 10 | 50      | 50 | 16     | 16 | 100   |
| Goat meat           | 10    | 10 | 15     | 15 | 10      | 10 | 65     | 65 | 100   |
| Chicken             | -     | -  | 23     | 23 | 50      | 50 | 27     | 27 | 100   |
| Dried fish          | 12    | 12 | 88     | 88 | -       | -  | -      | -  | 100   |

|                                              |    |    |    |    |    |    |    |    |     |
|----------------------------------------------|----|----|----|----|----|----|----|----|-----|
| Duck                                         | 4  | 4  | 96 | 96 | -  | -  | -  | -  | 100 |
| Fruits/Vegetables Guava                      | 10 | 10 | 70 | 70 | 8  | 8  | 12 | 12 | 100 |
| Mango ( <i>Mangifera indica</i> )            | 14 | 14 | 38 | 38 | 32 | 32 | 16 | 16 | 100 |
| Avocado Pear                                 | 8  | 8  | 60 | 60 | 24 | 24 | 8  | 8  | 100 |
| Ugiri ( <i>Ivringia gabonensis</i> )         | 7  | 7  | 44 | 44 | 17 | 17 | 32 | 32 | 100 |
| Pineapple                                    | 2  | 2  | 86 | 86 | 10 | 10 | 2  | 2  | 100 |
| Udara ( <i>Bush berry</i> )                  | 7  | 7  | 72 | 72 | 5  | 5  | 16 | 16 | 100 |
| Sour sop ( <i>Annona muricata</i> )          | 9  | 9  | 29 | 29 | 9  | 9  | 53 | 53 | 100 |
| Oranges ( <i>Citrus sinensis</i> )           | 8  | 8  | 88 | 88 | 3  | 3  | 1  | 1  | 100 |
| Pumpkin ( <i>Cucurbita spp</i> )             | 39 | 39 | 41 | 41 | 15 | 15 | 5  | 5  | 100 |
| Cent leaf ( <i>Occimum gratissimum</i> )     | 14 | 14 | 68 | 68 | 10 | 10 | 8  | 8  | 100 |
| Mushroom                                     | 10 | 10 | 81 | 81 | 5  | 5  | 4  | 4  | 100 |
| Tomatoes ( <i>Lycopersicon</i> )             | 24 | 24 | 36 | 36 | 20 | 20 | 20 | 20 | 100 |
| Ugu ( <i>Telferia</i> ) Oil/seeds            | 40 | 40 | 43 | 43 | 10 | 10 | 7  | 7  | 100 |
| Palm oil/fruit ( <i>Elaeis</i> )             | 5  | 5  | 5  | 5  | 17 | 17 | 73 | 73 | 100 |
| Oil bean ( <i>Pentaclethra macrophylla</i> ) | -  | -  | 13 | 13 | 33 | 33 | 54 | 54 | 100 |

Table 4b shows that 12% respondent consume dried fish daily, 55% consume it weekly, 30% consumed it monthly while 3% consumed it yearly. Crayfish was eaten by 42% respondents daily, 55% took it weekly, 1% respondent took it monthly and 2% took it yearly. Five percent respondents took pig meat daily; 80% took it weekly; 12% had it monthly and 3% took it yearly. Grass cutter was taken by 2% respondents on daily basis, 90% weekly; 2% monthly and 3% yearly. Two percent took goat meat daily, 85% took goat meat weekly, 10% took it monthly while 6% has it yearly. Chicken was taken by 22% respondents weekly, 50% monthly, and 28% yearly. Egg was taken by 87% respondent weekly and 13% monthly. Duck meat was taken by 44% weekly, 56% respondents ate duck monthly while none had on daily or yearly basis. Guava was eaten by 70% respondents weekly and 30% monthly. Mango was eaten by 12% and 88% respondents daily and weekly respectively. Avocado pears was eaten by 96% respondents weekly and 4% monthly. 1%, 98% and 1% took pawpaw on daily, weekly and monthly

basis respectively. Ninety-two percent respondents took pineapple weekly, and 8% took it monthly. Respondents who took udara (*Bush berry*) were 20% daily 79% weekly and 1% monthly. Eighty-two percent consumed pumpkin weekly and 18% monthly, oha (*Petrocarpus soyauxii*) soup was consumed by 92% respondents weekly and 8% monthly. Okazi (*Gongronema latifolium*) soup was also consumed by 22% daily, 75% weekly and 3% monthly. Achalla (*Cymogon citrate*) soup was consumed by 40% respondent weekly and 60% monthly. Cent leaves were eaten by 84% weekly and 16% monthly. Mushroom was eaten by 98% respondents weekly and 2% monthly. Seventy percent respondents ate potatoes daily, 25% weekly and 5% monthly. Palm oil was consumed by 37% respondents daily, 20% weekly, 33% monthly while 10% consumed it on yearly basis. Oil bean fruits was also taken by 7% daily, 20% weekly 33% had it monthly and 40% yearly. Four percent respondents took groundnut daily, 48% weekly, 38% monthly and 10% yearly. Fifteen percent respondents took coconut daily, 22% weekly, 30% monthly and 33% yearly

**Table 4b: Frequency of consumption of key micronutrient rich foods in Ohiya community of Abia State.**

| Food Groups  | Daily |    | Weekly |    | Monthly |    | Yearly |    | Total |
|--------------|-------|----|--------|----|---------|----|--------|----|-------|
|              | No    | %  | No     | %  | No      | %  | No     | %  |       |
| Animal foods |       |    |        |    |         |    |        |    |       |
| Dried fish   | 12    | 12 | 55     | 55 | 30      | 30 | 3      | 3  | 100   |
| Crayfish     | 42    | 42 | 55     | 55 | 1       | 1  | 2      | 2  | 100   |
| Pig meat     | 5     | 5  | 80     | 80 | 12      | 12 | 3      | 3  | 100   |
| Grass cutter | 2     | 2  | 90     | 90 | 2       | 2  | 6      | 6  | 100   |
| Goat meat    | 2     | 2  | 85     | 85 | 10      | 10 | 3      | 3  | 100   |
| Chicken      | -     | -  | 22     | 22 | 50      | 50 | 28     | 28 | 100   |
| Egg          | -     | -  | 87     | 87 | 13      | 13 | -      | -  | 100   |

|                                                     |    |    |    |    |    |    |    |    |     |
|-----------------------------------------------------|----|----|----|----|----|----|----|----|-----|
| Duck meat                                           | -  | -  | 44 | 44 | 56 | 56 | -  | -  | 100 |
| Vegetable/fruits Guava                              | -  | -  | 70 | 70 | 30 | 30 | -  | -  | 100 |
| Mango ( <i>Mangifera indica</i> )                   | 12 | 12 | 88 | 88 | -  | -  | -  | -  | 100 |
| Avocado Pear                                        | -  | -  | 96 | 96 | 4  | 4  | -  | -  | 100 |
| Oranges ( <i>Citrus sinensis</i> )                  | 2  | 2  | 98 | 98 | -  | -  | -  | -  | 100 |
| Pineapple                                           | -  | -  | 92 | 92 | 8  | 8  | -  | -  | 100 |
| Pawpaw ( <i>Carica papaya</i> )                     | 1  | 1  | 98 | 98 | 1  | 1  | -  | -  | 100 |
| Udara ( <i>Bush berry</i> )                         | 20 | 20 | 79 | 79 | 1  | 1  | -  | -  | 100 |
| Pumpkin ( <i>Cucurbita spp</i> )                    | -  | -  | 82 | 82 | 18 | 18 | -  | -  | 100 |
| DGLV ( <i>Telferia</i> ) pots of soup, oha soup     | -  | -  | 92 | 92 | 8  | 8  | -  | -  | 100 |
| Okazi soup ( <i>Gongronema latifolium</i> )         | -  | -  | 22 | 22 | 75 | 75 | 3  | 3  | 100 |
| Achalla soup ( <i>Cymogon citrate</i> )             | -  | -  | 40 | 40 | 60 | 60 | -  | -  | 100 |
| Scent leave ( <i>Occimum gratissimum</i> )          | -  | -  | 84 | 84 | 16 | 16 | -  | -  | 100 |
| Mushroom                                            | -  | -  | 98 | 98 | 2  | 2  | -  | -  | 100 |
| Potatoes                                            | 70 | 70 | 25 | 25 | 5  | 5  | -  | -  | 100 |
| Oil/oil seeds palm oil ( <i>Elaeis guineensis</i> ) | 37 | 37 | 20 | 20 | 33 | 33 | 10 | 10 | 100 |
| Oil bean ( <i>Penta clethra macrophylla</i> )       | 7  | 7  | 20 | 20 | 33 | 33 | 40 | 40 | 100 |
| Groundnut                                           | 4  | 4  | 48 | 48 | 38 | 38 | 10 | 10 | 100 |
| Coconut                                             | 15 | 15 | 22 | 22 | 30 | 30 | 33 | 33 | 100 |

#### 4.4 General Interview

Interview was conducted to ascertain the level of acceptability of some foods by indigenous people in the communities. In each household, two children aged 2-12 years and their mothers were interviewed for further study of food attributes of the people.

They were told to indicate their level of acceptability of foods in form of well-liked (WL) liked (L) not liked (NL) and very not liked (VNL). The food considered were grouped into four and these included animal foods, legumes, fruits and vegetables and soups.

Table 5a shows that 55% liked meat well, 15% liked meat, 14% were indifferent, 11% did not like meat and 5% did not like meat very much. Forty percent respondents well liked egg; 22% like egg; 19% were indifferent, 12% did not like eggs and 7% did not very much like egg. Respondents that like kidney very much were 60%, 10% liked kidney, 10% were indifferent. 10% did not like kidney while 10% did not very much like kidney. Ice fish was well liked by 60%; 12% liked it, 30% were indifferent, 10% did not like ice fish while 8% did not very much like ice fish. Snail was well liked by 11%, 22% liked it, 35% were indifferent 17% did not like snail while 15% did not very much like snail. Milk was well liked by 75%; 15% liked milk; 10% were indifferent and the rest indicating that nobody disliked milk.

Soya beans was well liked by 32%; 24% liked it; 22% were indifferent 12% did not like soya beans while 10% did not very much like soya beans. Beans was well liked

by 50%; 15% of respondent liked beans; 15% were indifferent; 10% did not like beans while 10% did not very much like beans. Onions was well liked by 38%; liked by 43%; 7% showed indifferent 12% did not like onions and the rest was not indicated. African yam beans was well liked by 46%; liked by 44%; 8% were indifferent 1% did not like it while 1% did not very much like it. Ugba (*Oil bean fruit*) was well liked by 14%; liked by 9%; 32% were indifferent, 14% did not like ugba (*Oil bean fruit*) while 31% did not very much like ugba (*Oil bean fruit*). Moi moi (*Cowpea cake*) was well liked by 50%; liked by 12%; 18% were indifference, 17% did not like moi moi (*Cowpea cake*) while 3% did not very much like moi moi (*Cowpea cake*). Akara (*Bean cake*) was well liked by 79%; liked by 12%, 6% were indifferent 3% did not like akara (*Bean cake*) while no response was got for not very much liked. Ujiri (*Ivringia gabonensis*) was well liked by 11% liked by 22%; 27% were indifferent 28% did not like ujiri (*Ivringia gabonensis*) and no response was got for not very much liked. Green leafy vegetable was well liked by 83%, liked by 10%; 7% were indifferent and the rest was not indicated. Pumpkin was well liked by 15% of the respondents, liked by 21%; 28% were indifferent, 15% did not like pumpkin while 13% did not very much like pumpkin. Pawpaw was well liked by 21% liked by 28%; 23% were indifferent 15% did not like pawpaw while 13% did not very much like it. Breadfruit was well liked by 30%; 31% liked it, 19% were indifferent 10% did not like breadfruit while 10% did not very much like it. Plantain was well liked by 28%; 23% liked it, 22% were indifferent 10% did not like it and 17% did not very much like it.

Oha (*Petrocarpus soyauxii*) soup was well liked by 22%, liked by 13%; 13% were indifferent, 24% did not like it while 28% did not very much like oha (*Petrocarpus soyauxii*)soup. Achalla (*Cymogon citrate*) soup was well liked by 24%, liked by 30%; 23% were indifferent, 16% did not like it while 7% did not very much like it. Jollof rice was well liked by 52%; 17% liked; 14% were indifferent, 14% did not like it while 3% did not very much like it. Yam porridge was well liked by 47% respondents; 18% children liked it, 13% children were indifferent 13% did not like it while 9% did not very much like yam porridge. Thirty-seven percent respondents well liked agidi (*Corn cake*) and stew, 36% liked it, 13% were indifferent, 13% did not like it while 1% did not very much like it.

[illegible]

|                                          |    |                |    |    |    |    |    |    |    |    |     |
|------------------------------------------|----|----------------|----|----|----|----|----|----|----|----|-----|
| Soya beans                               | 32 | 32             | 24 | 24 | 22 | 22 | 12 | 12 | 10 | 10 | 100 |
| Beans                                    | 50 | 50             | 15 | 15 | 15 | 15 | 10 | 10 | 10 | 10 | 100 |
| Onions                                   | 38 | 38             | 43 | 43 | 7  | 7  | 12 | 12 | -  | -  | 100 |
| African yam beans                        | 46 | 46             | 44 | 44 | 8  | 8  | 1  | 1  | 1  | 1  | 100 |
| Ugba ( <i>Oil bean fruit</i> )           | 14 | 14             | 9  | 9  | 32 | 32 | 14 | 14 | 31 | 31 | 100 |
| Moi moi ( <i>Cowpea cake</i> )           | 50 | 50             | 12 | 12 | 18 | 18 | 17 | 17 | 3  | 3  | 100 |
| Akara ( <i>Bean cake</i> )               | 79 | 79             | 12 | 12 | 6  | 6  | 3  | 3  | -  | -  | 100 |
| <b>Fruits/Vegetables</b>                 |    |                |    |    |    |    |    |    |    |    |     |
| Ugiri ( <i>Ivringia gabonensis</i> )     | 11 | 11             | 22 | 22 | 27 | 27 | 28 | 28 | -  | -  | 100 |
| Green leafy vegetable                    | 83 | 83             | 10 | 10 | 7  | 7  | -  | -  | -  | -  | 100 |
| Anyu ( <i>pumpkin</i> )                  | 15 | 15             | 21 | 21 | 28 | 28 | 23 | 23 | 13 | 13 | 100 |
| Pawpaw                                   | 21 | 21             | 28 | 28 | 23 | 23 | 15 | 15 | 13 | 13 | 100 |
| Breadfruit                               | 30 | 30             | 31 | 31 | 10 | 10 | 19 | 19 | 10 | 10 | 100 |
| Pear                                     | 12 | 12             | 30 | 30 | 24 | 24 | 19 | 19 | 15 | 15 | 100 |
| Plantain                                 | 28 | 28             | 23 | 23 | 22 | 22 | 10 | 10 | 17 | 17 | 100 |
| <b>Soups/One pot Meals</b>               |    |                |    |    |    |    |    |    |    |    |     |
| Oha ( <i>Petrocarpus soyauxii</i> ) soup | 22 | 22             | 13 | 13 | 13 | 13 | 24 | 24 | 28 | 28 | 100 |
| Achalla ( <i>Cymogon citrate</i> ) soup  | 24 | 24             | 30 | 30 | 23 | 23 | 16 | 16 | 7  | 7  | 100 |
| Jollof rice                              | 52 | 52             | 17 | 17 | 14 | 14 | 14 | 14 | 3  | 3  | 100 |
| Yam porridge                             | 47 | 47             | 18 | 18 | 13 | 13 | 13 | 13 | 9  | 9  | 100 |
| Agidi ( <i>Corn cake</i> ) and stew      | 37 | 37             | 36 | 36 | 13 | 13 | 13 | 13 | 1  | 1  | 100 |
| WL                                       | =  | Well liked     |    |    |    |    |    |    |    |    |     |
| L                                        | =  | Liked          |    |    |    |    |    |    |    |    |     |
| I                                        | =  | Indifference   |    |    |    |    |    |    |    |    |     |
| NL                                       | =  | Not well liked |    |    |    |    |    |    |    |    |     |
| VNL                                      | =  | Very not liked |    |    |    |    |    |    |    |    |     |

Table 5b shows that 45% respondents well liked egg, 28% liked egg, 12% were indifferent, 5% did not like egg while 10% did not very much like egg. Forty-five percent respondents well liked meat, 28% liked meat, 12% were indifferent, 5% did not like meat while 10% did not very much like meat. Kidney was well liked by 41%; 33% liked kidney, 17% were indifferent; 2% did not like it while 6% did not very much like it. Fresh/dry fish was well liked by 20%; 53% like fresh/dry fish; 3% were indifferent; 11% did not like fresh/dry fish while 3% did not very much like fresh/dry fish. Forty-one percent adults well liked snail; 33% liked snail, 17% adults were indifferent 5% did not like it while 4% did not very much like it. Soya beans was well liked by 20%; liked by 34%; while 12% were indifferent, 16% did not like it, while 18% did not very much like it. Beans was well liked by 22% of adults; 24% liked beans, 16% were indifferent, 10%

did not like beans and 16% did not very much like beans. Eleven percent adults well liked African yam beans, 51% liked it 13% were indifferent; eight did not like it while 17% did not very much like it. Ugba (*Oil bean fruit*) was well liked by 27%; 34% liked ugba (*Oil bean fruit*); 9% adults were indifferent 8% did not like ugba (*Oil bean fruit*) and 12% did not very much like ugba (*Oil bean fruit*). Twenty-three percent respondents well liked moi moi (*cowpea cake*), 41% liked moi moi (*cowpea cake*), 16% were indifferent 17% did not like it while 3% did not very much like it

Yellow corn was well liked by 42% respondents, 31% liked yellow corn, 12% were indifferent, 15% did not like yellow corn while nobody disliked it very much. Twenty-three percent respondents well liked akara (*Bean cake*), 31% liked akara (*Bean cake*), 12% were indifferent, 16% did not like it, 18% did not very much like it. Pumpkin was well liked by 14%; liked by 30%; 7% were indifferent, 23% did not like it while 26% did not very much like it. Pineapple was well liked by 50%; 37% liked it. 6% were indifference; 3% did not like it while 4% did not very much like it. Breadfruit was well liked by 40% respondents, 9% liked it, 10% were indifferent and 11 % did not like it. Pawpaw was well liked by 80% respondents, 10% liked it, 5% were indifferent while 5% did not like it. Green leafy vegetable was well liked by 98% respondents, liked by 2% respondents while none was indifferent and none did not like it and none did not very

much like it. plantain was well liked by 32% respondents liked by 36%, 14% were in different; 12% did not like plantain while 3% did not very much like it. Pear was well liked by 38% respondents, 31% liked it, 11% were in difference, 10% did not liked it and 10% did not very much like it.

Twenty five percent respondents well liked oha (*Petrocarpus soyauxii*) soup, 41% liked oha (*Petrocarpus soyauxii*) soup, 19% were in different 15% did not like oha (*Petrocarpus soyauxii*) soup, no response was got for not well liked. Achalla (*Cymogon citrate*) soup was well liked by 19% respondents, liked by 39%, 17% were in different, 18% did not liked achalla soup while. 7% did not very much like achalla (*Cymogon citrate*) soup. 50% respondents liked yam porridge very well 38% of them liked it 8% were in different whereas 2% did not like and 2% did not much like it. Thirty-five



|                                          |    |                       |    |    |    |    |    |    |    |    |     |
|------------------------------------------|----|-----------------------|----|----|----|----|----|----|----|----|-----|
| Soya beans                               | 20 | 20                    | 34 | 34 | 12 | 12 | 16 | 16 | 18 | 18 | 100 |
| Beans                                    | 22 | 22                    | 34 | 34 | 16 | 16 | 10 | 10 | 18 | 18 | 100 |
| African yam beans                        | 11 | 11                    | 51 | 51 | 13 | 13 | 8  | 8  | 17 | 17 | 100 |
| Ugba ( <i>Oil bean fruit</i> )           | 27 | 27                    | 34 | 34 | 9  | 9  | 8  | 8  | 12 | 12 | 100 |
| Moi moi ( <i>Cowpea cake</i> )           | 23 | 23                    | 41 | 41 | 16 | 16 | 17 | 17 | 3  | 3  | 100 |
| Yellow corn                              | 42 | 42                    | 31 | 31 | 12 | 12 | 15 | 15 | -  | -  | 100 |
| Akara ( <i>Bean cake</i> )               | 23 | 23                    | 31 | 31 | 12 | 12 | 16 | 16 | 18 | 18 | 100 |
| <b>Fruits/Vegetables</b>                 |    |                       |    |    |    |    |    |    |    |    |     |
| Anyu ( <i>pumpkin</i> )                  | 14 | 14                    | 30 | 30 | 7  | 7  | 23 | 23 | 26 | 26 | 100 |
| Pineapple                                | 50 | 50                    | 37 | 37 | 6  | 6  | 3  | 3  | 4  | 4  | 100 |
| Breadfruits                              | 40 | 40                    | 39 | 39 | 10 | 10 | 11 | 11 | -  | -  | 100 |
| Pawpaw                                   | 85 | 85                    | 17 | 17 | 5  | 5  | 5  | 5  | -  | -  | 100 |
| Green leafy vegetable                    | 98 | 98                    | 2  | 2  | -  | -  | -  | -  | -  | -  | 100 |
| Plantain                                 | 32 | 32                    | 36 | 36 | 14 | 14 | 12 | 12 | 3  | 3  | 100 |
| Pear                                     | 38 | 38                    | 31 | 31 | 11 | 11 | 10 | 10 | 10 | 10 | 100 |
| <b>Soups/One pot Meals</b>               |    |                       |    |    |    |    |    |    |    |    |     |
| Oha ( <i>Petrocarpus soyauxii</i> ) soup | 25 | 25                    | 41 | 41 | 19 | 19 | 15 | 15 | -  | -  | 100 |
| Achalla ( <i>Cymogon citrate</i> ) soup  | 19 | 19                    | 39 | 39 | 17 | 17 | 18 | 18 | 7  | 7  | 100 |
| Yam porridge                             | 50 | 50                    | 38 | 38 | 8  | 8  | 2  | 2  | 2  | 2  | 100 |
| Agidi ( <i>Corn cake</i> ) and stew      | 35 | 35                    | 35 | 35 | 20 | 20 | 6  | 6  | 4  | 4  | 100 |
| Jollof rice                              | 42 | 42                    | 57 | 57 | 2  | 2  | 2  | 2  | 3  | 3  | 100 |
| <hr/>                                    |    |                       |    |    |    |    |    |    |    |    |     |
| WL                                       | =  | <i>Well liked</i>     |    |    |    |    |    |    |    |    |     |
| L                                        | =  | <i>Liked</i>          |    |    |    |    |    |    |    |    |     |
| I                                        | =  | <i>Indifference</i>   |    |    |    |    |    |    |    |    |     |
| NL                                       | =  | <i>Not well liked</i> |    |    |    |    |    |    |    |    |     |
| VNL                                      | =  | <i>Very not liked</i> |    |    |    |    |    |    |    |    |     |

Table 5c shows that meat was well liked by 29%, liked by 57%, 13%, were indifferent 1% did not like meat well. None did not very much like meat. Forty-four percent respondents liked egg very much, 47% liked it, 5% were indifferent, 1% did not like it while 3% did not very much like egg. Kidney was well liked by 2% respondents, 43% liked it, 47% were indifferent, 3% did not like it and 5% was not very much liked. Two percent of the respondents well liked fresh/dry fish, 79% liked it, 19% were indifferent, no response was got for not liked and very not liked. Snail was well liked by 26% respondents, liked by 24% of respondents, liked by 24%, 28% were indifferent and 22% did not like it while the rest was not mentioned.

Soya beans was well liked by 2%, 20% liked it, 44% were indifferent, 18% did not like it while 16% did not very much like it. Four percent well liked beans, 82% liked beans, 10% were indifferent and 4% did not well like it. African yam beans was well liked by nobody, liked by 46%, 39% were indifferent and 15% did not like it. Four percent well liked ugba (*Oil bean fruit*), 2% liked it, 28% were indifferent, 47% did not like ugba (*Oil bean fruit*) 1% did not very much like ugba (*Oil bean fruit*). Moi moi (*Cowpea cake*) was well liked by 59%; liked by 19%; 20% showed indifferent to moi moi (*cow*), 2% did not like it and no response was got for not well liked. Yellow corn was well liked by 17% liked 66%, 11% showed indifferent to yellow com; 2% did not like it while 4% did not very much like it. Akara (*Bean cake*) was well liked by 48%, liked by 47%; 4% were indifferent to akara (*Bean cake*) while 1% did not like it. No response was got for very not liked. ; ; .

Pumpkin was well liked by 2%; liked by 22%, 25% were indifferent 24% did not like it while 27% did not very much like it. Pineapple was well liked by 16%, liked by 45%, 13% showed indifferent, 26% did not like it and no response was got for not well liked and very not liked. Breadfruit was well like by 29%, like by 24%, 45% were indifferent, 2% did not like it and no response was got for not well liked. Plantain was well liked by 2%, liked by 54%; 11% showed indifference, 33% did not like plantain while no response was got for not well liked. Pear was well liked by 4%, liked by 46%; 50% were indifferent and the rest was not indicated.

Oha (*Petrocarpus soyauxii*) soup was well liked by 3%, liked by 21%, 58% showed indifferent, 17% did not like it while 1% did not very much like it. Okazi (*Gongronema latifolium*) soup was well like by 18%, like by 59%; 20% were indifferent and 2% did not like while 1% did not very much like it. Achalla (*Cymogon citrate*) soup was well liked by 17%, liked by 66%, 21% showed indifferent, 2% did not like it while 4% did not very much like it. Yam porridge was well liked by 42% liked by 21%, 3% were indifferent, 34% did not like it while no response was got for not liked and very not liked.

Agidi (*Corn cake*) and stew was well liked by 17% liked 29%, 8% were indifferent, 46% did not like it while no response was got for very not liked. Jollof rice as well liked by 38% like by 45%, 16% were indifferent 1% did not like it and no response was got for not liked and very not liked.

**Table 5c: Frequency distribution of taste score of key micronutrient rich foods among children aged 2-12 years in Ohuhu Community.**

| Food Groups         | WL |    | L  |    | I  |    | NL |   | VNL |   | Total<br>% |
|---------------------|----|----|----|----|----|----|----|---|-----|---|------------|
|                     | No | %  | No | %  | No | %  | No | % | No  | % |            |
| <b>Animal foods</b> |    |    |    |    |    |    |    |   |     |   |            |
| Meat                | 29 | 29 | 57 | 57 | 13 | 13 | 1  | 1 | -   | - | 100        |
| Egg                 | 44 | 44 | 47 | 47 | 5  | 5  | 1  | 1 | 3   | 3 | 100        |
| Kidney              | 2  | 2  | 43 | 43 | 47 | 47 | 3  | 3 | 5   | 5 | 100        |
| Fresh/Dry fish      | 2  | 2  | 79 | 79 | 19 | 19 | -  | - | -   | - | 100        |

|                                             |    |                |    |    |    |    |    |    |    |    |     |
|---------------------------------------------|----|----------------|----|----|----|----|----|----|----|----|-----|
| Snail ( <i>Eju</i> )                        | 26 | 26             | 24 | 24 | 28 | 28 | 22 | 22 | -  | -  | 100 |
| <b>Legumes/Cereals</b>                      |    |                |    |    |    |    |    |    |    |    |     |
| Soya beans                                  | 2  | 2              | 20 | 20 | 44 | 44 | 18 | 18 | 16 | 16 | 100 |
| Beans                                       | 4  | 4              | 82 | 82 | 10 | 10 | 4  | 4  | -  | -  | 100 |
| African yam beans                           | -  | -              | 46 | 46 | 39 | 39 | 15 | 15 | -  | -  | 100 |
| Ugba ( <i>Oil bean fruit</i> )              | 4  | 4              | 20 | 20 | 28 | 28 | 47 | 47 | 1  | 1  | 100 |
| Moi moi ( <i>Cowpea cake</i> )              | 59 | 59             | 19 | 19 | 20 | 20 | 2  | 2  | -  | -  | 100 |
| Yellow corn                                 | 17 | 17             | 66 | 66 | 11 | 11 | 2  | 2  | 4  | 4  | 100 |
| Akara ( <i>Bean cake</i> )                  | 48 | 48             | 47 | 47 | 4  | 4  | 1  | 1  | -  | -  | 100 |
| <b>Fruits/Vegetables</b>                    |    |                |    |    |    |    |    |    |    |    |     |
| Pumpkin                                     | 2  | 2              | 22 | 22 | 25 | 25 | 24 | 24 | 27 | 27 | 100 |
| Pineapple                                   | 16 | 16             | 45 | 45 | 13 | 13 | 26 | 26 | -  | -  | 100 |
| Breadfruits                                 | 29 | 29             | 24 | 24 | 45 | 45 | 2  | 2  | -  | -  | 100 |
| Plantain                                    | 2  | 2              | 54 | 54 | 11 | 11 | 33 | 33 | -  | -  | 100 |
| Pear                                        | 4  | 4              | 46 | 46 | 50 | 50 | -  | -  | -  | -  | 100 |
| <b>Soups/One pot Meals</b>                  |    |                |    |    |    |    |    |    |    |    |     |
| Oha ( <i>Petrocarpus soyauxii</i> ) soup    | 3  | 3              | 21 | 21 | 58 | 58 | 17 | 17 | 1  | 1  | 100 |
| Okazi ( <i>Gongronema latifolium</i> ) soup | 18 | 18             | 59 | 59 | 20 | 20 | 2  | 2  | 1  | 1  | 100 |
| Achalla ( <i>Cymogon citrate</i> ) soup     | 17 | 17             | 66 | 66 | 21 | 21 | 2  | 2  | 4  | 4  | 100 |
| Yam porridge                                | 42 | 42             | 21 | 21 | 3  | 3  | 34 | 34 | -  | -  | 100 |
| Agidi ( <i>Corn cake</i> ) and stew         | 17 | 17             | 29 | 29 | 8  | 8  | 46 | 46 | -  | -  | 100 |
| Jollof rice                                 | 38 | 38             | 45 | 45 | 16 | 16 | 1  | 1  | -  | -  | 100 |
| <hr/>                                       |    |                |    |    |    |    |    |    |    |    |     |
| WL                                          | =  | Well liked     |    |    |    |    |    |    |    |    |     |
| L                                           | =  | Liked          |    |    |    |    |    |    |    |    |     |
| I                                           | =  | Indifference   |    |    |    |    |    |    |    |    |     |
| NL                                          | =  | Not well liked |    |    |    |    |    |    |    |    |     |
| VNL                                         | =  | Very not liked |    |    |    |    |    |    |    |    |     |

Table 5d shows that meat was well liked by 29%, liked by 57%, 13% were indifferent and 1% did not like it. Not very liked got no response. Egg was well liked by 47%, liked by 47%, 5% were indifferent while 1% did not like it. Not very liked got no response. Kidney was well liked by 2%, liked by 43%, 52% were indifferent, 3% did not like it. No response was got for very not liked. Fresh/dry fish was well liked by 79%, liked by 19%, 2% were indifferent No response was got for not liked and very not liked. Snail was well liked by 36%, liked by 17%, 20% showed indifference, 16% did not like it while 11% did not very much like it.

Soya beans was well liked by 2%, liked by 20%, 44% were indifferent, 18% did not like it and 16% did not very much like it. Beans was well liked by 4%, 82% liked it, 10% were indifferent and 4% did not very much like beans. Thirty-four percent liked African yam beans, 63% were indifferent and 3% did not like it at all. No responses were got for well liked and very not liked. Ugba (*Oil bean fruit*) was well liked by 4%, liked by 20%, 28% showed indifference, 47% did not like it while 1% did not like it and no response was got for very not liked. Moi moi (*Cowpea cake*) was well liked by 59%, 19% liked it 20% were indifferent and 2% did not like it. Yellow corn was well liked by 17%, liked by 66%, 21% showed indifference, 2% did not like it, 4% did not very much like it. Akara (*Bean cake*) was well liked by 48%, liked by 47%, 4% were indifferent and 1% did not like it.

Twenty-one percent respondents liked pumpkin well, 20% liked it, 25% were indifferent, 17% did not like it while 17% did not very much like it. Pineapple was well liked by 16%, 45% like it, 13% were indifferent 26% did not like pineapple and no response was got for very not liked. Breadfruit was well liked by 29%, liked by 26%, 45% were indifferent, no response was got for not liked and very not liked. Pear was well liked by 2%, liked by 54%, 12% were indifferent, 32% did not like it at all.

Oha (*Petrocarpus soyauxii*) soup was well liked by 2% liked by 22%, 48% were indifferent 15% did not like it while 13% did not very much like it. Okazi (*Gongronema latifolium*) soup was well liked by 16%, liked by 32%, 42% showed indifferent 3% did not like it while 7% did not very much like it. Achalla (*Cymogon citrate*) soup was well liked by 39% like by 38%, 39% were indifferent while 14% did not like it. Yam porridge was well liked by 25% liked by 71%, 1% was indifferent and 3% did not like it, no response was got for very not liked. Agidi (*Corn cake*) and stew was well liked by 20% liked 27%, 16% were indifferent, 11% did not like it, 16% did not very much like it. Jollof rice was well liked by 47%, liked by 20%, 7% were indifferent, 18% did not like it while 8% did not very much like it.

**Table 5d: Frequency distribution of taste score of key micronutrient rich foods among adults in Ohuhu Community.**

| Food Groups  | WL |    | L  |    | I  |    | NL |   | VNL |   | Total |
|--------------|----|----|----|----|----|----|----|---|-----|---|-------|
|              | No | %  | No | %  | No | %  | No | % | No  | % |       |
| Animal foods |    |    |    |    |    |    |    |   |     |   |       |
| Meat         | 29 | 29 | 57 | 57 | 13 | 13 | 1  | 1 | -   | - | 100   |
| Egg          | 47 | 47 | 47 | 47 | 5  | 5  | 1  | 1 | -   | - | 100   |
| Kidney       | 2  | 2  | 43 | 43 | 52 | 52 | 3  | 3 | -   | - | 100   |

|                                             |    |                |    |    |    |    |    |    |    |    |     |
|---------------------------------------------|----|----------------|----|----|----|----|----|----|----|----|-----|
| Fresh/Dry fish                              | 79 | 79             | 19 | 19 | 2  | 2  | -  | -  | -  | -  | 100 |
| Snail                                       | 36 | 36             | 17 | 17 | 20 | 20 | 16 | 16 | 11 | 11 | 100 |
| <b>Legumes/Cereals</b>                      |    |                |    |    |    |    |    |    |    |    |     |
| Soya beans                                  | 2  | 2              | 20 | 20 | 44 | 44 | 18 | 18 | 16 | 16 | 100 |
| Beans                                       | 4  | 4              | 82 | 82 | 10 | 10 | 4  | 4  | -  | -  | 100 |
| African yam beans                           | -  | -              | 34 | 34 | 63 | 63 | 3  | 3  | -  | -  | 100 |
| Ugba ( <i>Oil bean fruit</i> )              | 4  | 4              | 20 | 20 | 28 | 28 | 47 | 47 | 1  | 1  | 100 |
| Moi moi ( <i>Cowpea cake</i> )              | 59 | 59             | 19 | 19 | 20 | 20 | 2  | 2  | -  | -  | 100 |
| Yellow corn                                 | 17 | 17             | 66 | 66 | 21 | 21 | 2  | 2  | 4  | 4  | 100 |
| Akara ( <i>Bean cake</i> )                  | 48 | 48             | 47 | 47 | 4  | 4  | 1  | 1  | -  | -  | 100 |
| <b>Fruits/Vegetables</b>                    |    |                |    |    |    |    |    |    |    |    |     |
| Pumpkin                                     | 21 | 21             | 20 | 20 | 25 | 25 | 17 | 17 | 17 | 17 | 100 |
| Pineapple                                   | 16 | 16             | 45 | 45 | 13 | 13 | 26 | 26 | -  | -  | 100 |
| Breadfruits                                 | 29 | 29             | 26 | 26 | 45 | 45 | -  | -  | -  | -  | 100 |
| Pear                                        | 2  | 2              | 54 | 54 | 12 | 12 | 32 | 32 | -  | -  | 100 |
| <b>Soups/One pot Meals</b>                  |    |                |    |    |    |    |    |    |    |    |     |
| Oha ( <i>Petrocarpus soyauxii</i> ) soup    | 2  | 2              | 22 | 22 | 48 | 48 | 15 | 15 | 13 | 13 | 100 |
| Okazi ( <i>Gongronema latifolium</i> ) soup | 16 | 16             | 32 | 32 | 42 | 42 | 3  | 3  | 7  | 7  | 100 |
| Achalla ( <i>Cymogon citrate</i> ) soup     | 39 | 39             | 38 | 38 | 19 | 19 | 14 | 14 | -  | -  | 100 |
| Yam porridge                                | 25 | 25             | 71 | 71 | 1  | 1  | 3  | 3  | -  | -  | 100 |
| Agidi ( <i>Corn cake</i> ) and stew         | 20 | 20             | 27 | 27 | 16 | 16 | 11 | 11 | 16 | 16 | 100 |
| Jollof rice                                 | 47 | 47             | 20 | 20 | 7  | 7  | 18 | 18 | 8  | 8  | 100 |
| <hr/>                                       |    |                |    |    |    |    |    |    |    |    |     |
| WL                                          | =  | Well liked     |    |    |    |    |    |    |    |    |     |
| L                                           | =  | Liked          |    |    |    |    |    |    |    |    |     |
| I                                           | =  | Indifference   |    |    |    |    |    |    |    |    |     |
| NL                                          | =  | Not well liked |    |    |    |    |    |    |    |    |     |
| VNL                                         | =  | Very not liked |    |    |    |    |    |    |    |    |     |

#### 4.5 Infant Feeding Practices among the Two Indigenous Communities

The family size in most of the communities were quiet large. This is because traditional Igbo families do not believe in family planning because it is God that gives the children and it will be unfair to refuse God's blessing. Large families also assisted the head of the home in working on vast areas of land. The literates among them still practiced family planning.

Majority of the mothers gave their babies colostrum while few others gave only breast milk. The reason behind the later action is that the colostrum (initial breast milk) is unhealthy for infant. Majority of mothers wean their babies off breast between 6-12 months although some breast feed till 2 years and above. Exclusive breast feeding is still not accepted by many for so many reasons varying from maintaining tradition to avoiding dehydration.

Table 6 shows that 8% mothers in Ohuhu and 2% mothers in Ohiya stopped breastfeeding their babies at 10 months of age. Mothers who stopped breastfeeding their babies at eleven months are 8% in Ohuhu and 10% in Ohiya. Four percent mothers in Ohuhu and 20% mothers in Ohiya stopped breastfeeding their babies at 12 months. At thirteenth month 8% mothers from Ohuhu and 2% mother from Ohiya stopped breastfeeding their children. At fourteenth month of age, 8% mothers from Ohuhu and 10% mothers from Ohiya stopped breastfeeding their babies. Fourteen percent mothers from Ohuhu and 4% mothers from Ohiya stopped breastfeeding their babies at fifteenth month. Mothers who stopped breastfeeding at sixteenth month were 24% from Ohuhu and 10% mothers from Ohiya respectively. Mothers who stopped breastfeeding at seventeenth month were 10% from Ohuhu and 20% from Ohiya. Eight percent and 4% mothers in Ohuhu and Ohiya breastfeed their babies till eighteenth month respectively. The respondents that feed their babies till nineteen months were 8% from Ohuhu and 5% from Ohiya. No woman in Ohuhu breastfed beyond the 19<sup>th</sup> month while 4% women in Ohiya breastfed their babies till 20<sup>th</sup> month and 21<sup>st</sup> month after birth. Two percent women breastfed their babies both at 22<sup>nd</sup> and 23<sup>rd</sup> month and only 1% breastfed her baby till 24<sup>th</sup> month.

**Table 6: Age at which Breast milk was stopped**

| Age in Months | Ohuhu     |            | Ohiya     |            |
|---------------|-----------|------------|-----------|------------|
|               | Frequency | Percentage | Frequency | Percentage |
| 10            | 8         | 8          | 2         | 2          |

|              |            |            |            |            |
|--------------|------------|------------|------------|------------|
| 11           | 8          | 8          | 10         | 10         |
| 12           | 4          | 4          | 20         | 20         |
| 13           | 8          | 8          | 2          | 2          |
| 14           | 8          | 8          | 10         | 10         |
| 15           | 14         | 14         | 4          | 4          |
| 16           | 24         | 24         | 10         | 10         |
| 17           | 10         | 10         | 20         | 20         |
| 18           | 8          | 8          | 4          | 4          |
| 19           | 8          | 8          | 5          | 5          |
| 20           | -          | -          | 4          | 4          |
| 21           | -          | -          | 4          | 4          |
| 22           | -          | -          | 2          | 2          |
| 23           | -          | -          | 2          | 2          |
| 24           | -          | -          | 1          | 1          |
| <b>Total</b> | <b>100</b> | <b>100</b> | <b>100</b> | <b>100</b> |

#### **4.6 Anthropometric Measurements of Infants in the Two Communities under Study**

In Table 7a, In Ohuhu, 8 males and 5 females were aged 0-2 years. Those within 3-5 years were 12 males and 17 females etc.

In Ohiya children 0-2 years were 6 males and 17 females; 3-5 years were 15 males and 10 females; 6-9 years were 8 males and 6 females and 10-12 years were 16 males and 22 females.

**Table 7a: Distribution of Children by Age/Sex in each Community**

| Age in years | Ohuhu     |           | Ohiya     |           |
|--------------|-----------|-----------|-----------|-----------|
|              | M         | F         | M         | F         |
| 0 – 2        | 8         | 5         | 6         | 17        |
| 3 – 5        | 12        | 17        | 15        | 10        |
| 6 – 9        | 11        | 7         | 8         | 6         |
| 10 – 12      | 20        | 20        | 16        | 22        |
| <b>Total</b> | <b>51</b> | <b>49</b> | <b>45</b> | <b>55</b> |

Table 7b shows that in Ohuhu, 92 children were normal using weight for age index. Out of this, 22 (11%) were within 0-2 years, 24 (12%) were within 3-5 years, 16 (8%) within 6-9 years and 30 (15%) within 10-12 years. For Ohiya, 82 were normal. This

is distributed thus: 0-2 years, 12 (6%); 3-5 years, 28 (14%); 6-9 years, 10 (5%) and 10-12 years, 32(16%).

For overweight, in Ohuhu we have 4 (four) children who were distributed thus: one child was within 0-2 years, another child within 3-5 years. Two children were within 6-9 years and none was within 10-12 years. Number of children who were underweight were 13 (6.5%), 6(3%) were children within 0-2 years, 3 (1.5%) were children within 3-5 years, 2 (1%) were those within 3-5 years, 2 (1%) were those within 6-9 years and 2 (1%) were children within 10 - 12 years.

**Table 7b: Percentage distribution of nutritional status indicators (weight-for-age) of children in Ohuhu and Ohiya communities.**

| Community | Nutritional Status | 0-2 years |           | 3-5 years |           | 6-9 years |           | 10-12 years |          | Total %    |
|-----------|--------------------|-----------|-----------|-----------|-----------|-----------|-----------|-------------|----------|------------|
|           |                    | Freq.     | %         | Freq.     | %         | Freq.     | %         | Freq.       | %        |            |
| Ohuhu     | Normal             | 22        | 11        | 24        | 12        | 16        | 8         | 30          | 15       |            |
| Ohiya     | Normal             | <u>12</u> | <u>6</u>  | <u>28</u> | <u>14</u> | <u>10</u> | <u>5</u>  | <u>32</u>   | 16       |            |
|           |                    |           | 17        |           | 26        |           | 13        |             | 31       | 87         |
| Ohuhu     | Overweight         | 1         | .5        | 1         | .5        | 2         | 1         | -           | -        |            |
| Ohiya     | Overweight         | <u>1</u>  | <u>.5</u> | <u>1</u>  | <u>.5</u> | <u>1</u>  | <u>.5</u> | <u>-</u>    | <u>-</u> |            |
|           |                    |           | 1         |           | 1         |           | 1.5       |             | 0        | 3          |
| Ohuhu     | Underweight        | 6         | 3         | 3         | 1.5       | 2         | 1         | 2           | 1        |            |
| Ohiya     | Underweight        | <u>1</u>  | <u>.5</u> | <u>1</u>  | <u>.5</u> | <u>1</u>  | <u>.5</u> | <u>2</u>    | 1        |            |
|           |                    |           | 3.5       |           | 2         |           | 2         |             | 2        | <u>10</u>  |
|           |                    |           |           |           |           |           |           |             |          | <b>100</b> |

*Normal – reference ( $\pm 1$  SD)*

*Overweight and 2SD*

*Underweight - 2SD*

Using length-for-age index in Table 7c. In Ohuhu 80 children had normal length, out of this, 10 (5%) were within 0-2 years, 22 (11%) were within 3-5 years, 18 (9%) were within 6-9 years while 30 (15%) were within 10-12 years. Six children were above

normal length-for-age, two children 0-2 years were above normal length using length-for-age index, one child with the same data shows 3-5 years, two children were within 6-9 years and one child was within 10-12 years. Seven children were stunted. Two children were within 0-2 years, two children were within 3-5 years, two children were within 6-9 years and one child was within 10-12 years.

In Ohiya 82 children were within normal using length-for-age index. 16 children were within 0-2 years, 34 children were within 3-5 years 14 children were within 6-9 years while 28 were within 10-12 years. Eight children were above normal among which one was a child within 0-2 years, 2 children were within 3-5 years, 4 children were within 6-9 years and one child was within 10-12 years.

**Table 7c: Percentage distribution of nutritional status indicators (length - for - age) of children in Ohuhu and Ohiya communities.**

| Community | Nutritional Status | 0-2 years |           | 3-5 years |           | 6-9 years |            | 10-12 years |    | Total %    |
|-----------|--------------------|-----------|-----------|-----------|-----------|-----------|------------|-------------|----|------------|
|           |                    | Freq.     | %         | Freq.     | %         | Freq.     | %          | Freq.       | %  |            |
| Ohuhu     | Normal             | 10        | 5         | 22        | 11        | 18        | 9          | 30          | 15 |            |
| Ohiya     | Normal             | <u>16</u> | <u>8</u>  | <u>34</u> | <u>17</u> | <u>14</u> | <u>7</u>   | <u>28</u>   | 14 |            |
|           |                    |           | 13        |           | 28        |           | 16         |             | 29 | 86         |
| Ohuhu     | Above normal       | 2         | 1         | 1         | .5        | 2         | 1          | 1           | .5 |            |
| Ohiya     | Above normal       | <u>1</u>  | <u>.5</u> | <u>2</u>  | <u>1</u>  | <u>4</u>  | <u>2</u>   | <u>1</u>    | .5 |            |
|           |                    |           | 1.5       |           | 1.5       |           | 2          |             | 1  | 6          |
| Ohuhu     | Stunted            | 2         | 1         | 2         | 1         | 2         | 1          | 1           | .5 |            |
| Ohiya     | Stunted            | <u>1</u>  | <u>.5</u> | <u>4</u>  | <u>2</u>  | <u>3</u>  | <u>1.5</u> | <u>1</u>    | .5 |            |
|           |                    |           | 1.5       |           | 3         |           | 2.5        |             | 1  | <u>8</u>   |
|           |                    |           |           |           |           |           |            |             |    | <b>100</b> |

Table 7d weight-for-height index showed that 93% of the subjects were well nourished. Out of the children, 5 (2.5%) were overweight and 2 (1%) were wasted. The age-range distribution of the well-nourished are as follows; 0-2 years 24 (14%), 3-5

years, 36 (18%), 6-9 years 64 (32%) and 10 - 12 years 58 (29%). Subjects that were overweight are as follows: 3-5 years 2 (1%), 6-9 years 4 (2%) and 10-12 years 4 (2%) in both study communities. The wasted children were 4 (2%).

**Table 7d: Percentage distribution of nutritional status indicators (weight - for - height) of children in Ohuhu and Ohiya communities.**

| Community | Nutritional Status | 0-2 years |          | 3-5 years |            | 6-9 years |           | 10-12 years |      | Total %    |
|-----------|--------------------|-----------|----------|-----------|------------|-----------|-----------|-------------|------|------------|
|           |                    | Freq.     | %        | Freq.     | %          | Freq.     | %         | Freq.       | %    |            |
| Ohuhu     | Well nourished     | 12        | 6        | 19        | 9.5        | 44        | 22        | 29          | 14.5 |            |
| Ohiya     | Well nourished     | <u>16</u> | <u>8</u> | <u>17</u> | <u>8.5</u> | <u>20</u> | <u>10</u> | <u>29</u>   | 14.5 |            |
|           |                    |           | 14       |           | 18         |           | 32        |             | 29   | 93         |
| Ohuhu     | Obese              | -         |          | 1         | .5         | 2         | 1         | 2           | 1    |            |
| Ohiya     | Obese              | -         |          | <u>1</u>  | <u>.5</u>  | <u>2</u>  | <u>1</u>  | <u>2</u>    | 1    |            |
|           |                    |           | -        |           | 1          |           | 2         |             | 2    | 5          |
| Ohuhu     | Wasted             | 2         | 1        | 1         | .5         | -         |           | -           |      |            |
| Ohiya     | wasted             | -         | -        | <u>1</u>  | <u>.5</u>  | -         |           | -           |      |            |
|           |                    |           | 1        |           | 1          |           | -         |             | -    | <u>2</u>   |
|           |                    |           |          |           |            |           |           |             |      | <b>100</b> |

#### 4.7 Nutrient Analysis of Traditional Foods

Achalla oyibo (*Cymogon citrate*) contains 4.3g protein, 0.4g fat, 0.4g crude fibre, 1.4g ash, 47.7gm moisture carbohydrate 53g with an energy value of 232.8kcal. Utazi (*Gongronema latifolium*) contains 18.0g protein, 4.8g fat, 3.6g crude fibre, carbohydrate 34g 2.7g ash, 56.7g moisture with an energy value 115.2kcal. Ugu (*Telferia occidentalis*) protein content was 14.8g, fat, 2.6g crude fibre 2.1g, 0.6g ash, 60.0 moisture, carbohydrate 59.4g and energy value 320.2kcal. Pumpkin (*Cucurbita pepo*) contains 22.8g protein, 2.8g fat, 1.8g crude fibre, 1.4 ash, 69.0g moisture, carbohydrate 74.4g with energy value 414kcal. Water leaf (*Talinum triangulare*) contains 12.4g protein, 0.8g fat, 1.0g crude fibre, 1.8g Ash, 70.2g moisture carbohydrate 86.8g with energy value 404kcal. Oha (*Pterocarpus soyauxii*) contains 3.5g protein, 0.8g fat, 4.8g crude fibre, 3.8 ash, carbohydrate 96g with energy value 405.2kcal. Uziza (*Piper guineense*) seeds contains 3.4g protein, 0.2g fat, 4.2 crude fibre, 4.6 ash, 10.5 moisture, carbohydrate 96.4g with energy value 111kcal. Ehulu (*Mondora myrstica*) seed contains protein 3.8g, 0.2g fat, 1.3g crude fibre, 3.1g ash, 15.6g moisture, carbohydrate 96g with energy value 401kcal. Uda (*Xylopiia aethiopicum*) seed contains 3.6g protein, 2.4g fat, 6.8 crude fibre, 4.3g ash, 42.7 moisture carbohydrate 95g with energy value 412kcal. Canda (*Cow skin*) contains 28.3g protein, 16.8g fat, 6.0g crude fibre, 2.6g ash, 38.4 moisture, carbohydrate 55.4 and energy value 486kcal. Ejule (*Snail*) contains 10.6g protein, 1.2g fat, no crude fibre, 4.3g ash, 65.7g moisture, carbohydrate 88.2g with energy value 406kcal. Ikpokpo (*Acanthaceae*) contains 2.8g protein, 0.4g fat, 2.8g crude fibre, 3.7 ash, 61.6 moisture, carbohydrate 96.8g with energy value 402kcal. Olima (*Afromomum dantelli*) seed contains 14.7g protein, 0.1g fat, 1.1g crude fibre, 1.8 ash, 29.2g moisture, carbohydrate 85.2g and energy value 400.5kcal. Ntioke (*Portulaca oleraceci*) contains 2.1g protein, 0.1g fat, 12.3g crude fibre, 6.9 ash, 18.6 moisture, carbohydrate 97.7g and energy value 400.5kcal. Onunu-guava (*Psidium guajava*) contains 3.3g protein, 0.1g fat, 0.9 crude fribe, 1.8 ash, 35.4 moisture, carbohydrate 96.6g with energy value 400kcal. Onugbu (*Veronia amagdalina*) contains 14.6g protein, 2.1g fat, 0.4 crude fibre, 1.6g ash, 62.1g moisture. Carbohydrate 83.3g with energy value 410.5kcal. All these values are per 100 gram edible protein.

**Table 8: Proximate composition of some identified indigenous foods in Ohuhu and Ohiya communities.**

| S/N | Local Name    | Identification               | Protein<br>(g) | Fat<br>(g) | Crude fibre<br>(g) | Ash<br>(g) | Moisture<br>(g) | CHO<br>(g) | Energy<br>value Kcal |
|-----|---------------|------------------------------|----------------|------------|--------------------|------------|-----------------|------------|----------------------|
| 1   | Achalla oyibo | <i>Cymogon citrate</i>       | 4.3            | 0.4        | 0.4                | 1.4        | 47.7            | 53         | 232.8                |
| 2   | Utazi         | <i>Gongronema latifolium</i> | 18.0           | 4.8        | 3.6                | 2.7        | 56.7            | 34         | 115.2                |
| 3   | Ugu           | <i>Telferia occidentalis</i> | 14.8           | 2.6        | 2.1                | 0.6        | 60.0            | 59.4       | 320.2                |
| 4   | Pumpkin       | <i>Cucurbita pepo</i>        | 22.8           | 2.8        | 1.8                | 1.4        | 69.0            | 74.4       | 414                  |
| 5   | Waterleaf     | <i>Talinum traingulare</i>   | 12.4           | 0.8        | 1.0                | 1.8        | 70.2            | 86.8       | 404                  |
| 6   | Oha           | <i>Pterocarpus soyauxii</i>  | 3.5            | 0.8        | 4.8                | 3.8        | 56.3            | 96         | 405.2                |
| 7   | Nti oke       | <i>Portulaca oleracea</i>    | 2.1            | 0.1        | 12.3               | 6.9        | 18.6            | 97.7       | 400                  |
| 8.  | Onunu-guava   | <i>Psidium guajava</i>       | 3.3            | 0.1        | 0.9                | 1.8        | 35.4            | 96.6       | 400.5                |
| 9.  | Onugbu        | <i>Veronia amagdalina</i>    | 14.6           | 2.1        | 0.4                | 1.6        | 62.1            | 83.3       | 410.5                |
| 10  | Uziza seed    | <i>Piper guineense</i>       | 3.4            | 0.2        | 4.2                | 4.6        | 10.5            | 96.4       | 111.8                |
| 11  | Ehulu seed    | <i>Mondora myrstica</i>      | 3.8            | 0.2        | 1.3                | 3.1        | 15.6            | 96         | 401                  |
| 12  | Uda seed      | <i>Xylophia aethiopicum</i>  | 3.6            | 2.4        | 6.8                | 4.3        | 42.7            | 95         | 412                  |
| 13  | Olima seed    | <i>Afromomum dantelli</i>    | 14.7           | 0.1        | 1.1                | 1.8        | 29.2            | 85.2       | 400.5                |
| 14  | Canda skin    | <i>Boss spp</i>              | 28.3           | 16.8       | 6.0                | 2.6        | 38.4            | 55.4       | 486                  |
| 15  | Ejule         | <i>Achantina achantina</i>   | 10.6           | 1.2        | 0                  | 4.3        | 65.7            | 88.2       | 406                  |
| 16  | Ikpo kpo      | <i>Acanthaceae</i>           | 2.8            | 0.4        | 2.8                | 3.5        | 61.6            | 96.8       | 402                  |

#### 4.8 Weighed Food Intake

Table 9a showed that the total energy intake of children age 0-2 years was 930kcal which gave 74.44% of the Recommended Daily Intake. Out of this, starchy roots/tubers

contributed to 16.64% (154.75g), vegetable contributed 1.333% (12.40g), Nuts and seeds contributed 9.123% (84.848g). 0.489% (4.557g) was contribution from legumes. Cereals contributed 1.38% (12.91g) and 16.7% (156.15g) was from palm oil.

Total protein intake was 38.03g which gave 237.68% of the Recommended Daily Intake. Out of this starchy roots/tubers contributed to 3.09% (1.175g), 1.06% (420.963g) was contribution by vegetable. Nuts and seeds contributed to 9.009% (3.426g), legumes contributed to 9% (3.426g), cereals contributed 7.85% (2.985g). There was no protein contribution from palm oil.

Total calcium intake was 312.15g which gave 69.4% of Recommended Daily Intake. Out of which starchy roots/tubers contributed to 6.5% (20.30g), vegetables contributed 12.2% (38.18g), Nuts and seeds contributed to 7.2% (22.5g), legumes contributed to 29.7% (92.92g) and lastly cereals contributed to 0.9% (52g). Palm oil contributed nothing.

Total iron intake of children 0-2 years was 33.59g which gave 395.2% of the Recommended Daily Intake. Out of this starchy roots and tubers contributed to 3.62% (1.22g), vegetables contributed to 1.94% (0.65g), Nuts and seeds contributed to 9.1% (3.07g), legumes contributed to 17.39% (5.84g) and cereals contributed to 2.3% (0.79g). Palm oil made no contribution.

Total vitamin A intake of children 0.2 years study areas were 3673.8g which gave 918.3% of the Recommended Daily Intake. Out of this starchy roots and tubers contributed to 0.12% (4.45g), vegetables contributed to 4.8% (176.03g), Nut and seeds made no contribution, legumes contributed to 0.54% (19.96g), palm oil contributed to 82.16% (3018.5g). Cereals contributed nothing.

Total thiamine intake was 1.008g which gave 202% of Recommended Daily Intake. Out of this, starchy roots/tubers contributed to 4.8% (0.049g), vegetables contributed to 1.28% (0.013g), Nuts and seeds contributed to 81.05% (0.817g), legumes contributed to 5.92% (0.66g). Cereals made no contribution, palm oil contributed 9.39% (94.71g).

Riboflavin intake was 0.338g which gave 42.25% of the Recommended Daily Intake. Out of this starchy roots/tubers contributed to 4.8% (0.04g), vegetables contributed to 21.59% (0.073g), Nuts and seeds contributed to 8.23% (0.028g), legumes 44.37% (0.154g) cereal contributed to 2.07% (0.007g).

Niacin intake was 4.08kcal which gave 47.44% of the Recommended Daily Intake. Out of this, starchy roots and tuber contributed 4.8% (0.197g) vegetable contributed to 5.34% (0.218g), nuts and seeds contributed 9.83% (0.401g) legumes contributed 54.9% (2.24g), cereal contributed 17.9% (0.731g). Palm oil made no-contribution.

Finally, total ascorbic acid intake was 59.18g which gave 295.9% of the Recommended Daily Intake. Out of this, starchy roots/tubers contributed to 54.06% (31.95g), vegetables 31.41% (18.592g), cereals contributed to 0.439% (0.26g). Palm oil, nuts/seeds and legumes made no contribution.

**Table 9a: Nutrient intakes and contribution of traditional food to mean daily intake of children aged 0-2 years in Ohuhu and Ohiya communities of Abia State.**

|                                          | Energy<br>(kcal) | Protein<br>(gm) | Calcium<br>(mg) | Iron<br>(mg) | Vitamin<br>A (RE) | Thiamine<br>(mg) | Riboflavin<br>(mg) | Niacin<br>(mg) | Ascorbic<br>Acid (mg) |
|------------------------------------------|------------------|-----------------|-----------------|--------------|-------------------|------------------|--------------------|----------------|-----------------------|
| Total intake                             | 930              | 38.03           | 312.15          | 33.59        | 3672.8            | 1.008            | 0.338              | 4.08           | 59.18                 |
| FAO/WHO<br>Requirements                  | 1250             | 16              | 450             | 8.5          | 400               | 0.5              | 0.8                | 8.6            | 20                    |
| % intake of<br>requirement               | 74.44            | 237.68          | 69.4            | 395.2        | 918.3             | 202              | 42.25              | 47.44          | 295.9                 |
| <b>Starchy</b>                           |                  |                 |                 |              |                   |                  |                    |                |                       |
| <b>root/tubers</b>                       | 154.75           | 1.175           | 20.30           | 1.22         | 4.45              | 0.049            | 0.04               | 0.197          | 31.95                 |
| % contribution<br>of roots and<br>tubers | 16.64            | 3.09            | 6.5             | 3.62         | 0.12              | 4.8              | 11.83              | 4.8            | 54.06                 |
| <b>Vegetables</b>                        | 12.40            | 420.963         | 38.18           | 0.65         | 176.03            | 0.013            | 0.073              | 0.218          | 18.592                |
| % contribution<br>of vegetable           | 1.333            | 1.106           | 12.2            | 1.94         | 4.8               | 1.28             | 21.59              | 5.34           | 31.41                 |
| <b>Nuts and seeds</b>                    | 84.848           | 3.426           | 22.5            | 3.07         | -                 | 0.817            | 0.028              | 0.401          | -                     |
| % contribution<br>of fruits and<br>seeds | 9.123            | 9.009           | 7.2             | 9.1          | -                 | 81.05            | 8.23               | 9.83           | -                     |
| <b>Legumes</b>                           | 4.557            | 22.675          | 92.92           | 5.84         | 19.96             | 0.66             | 0.154              | 2.24           | -                     |
| % contribution<br>of legumes             | 0.489            | 60.58           | 29.7            | 17.39        | 0.54              | 5.92             | 44.37              | 54.9           | -                     |
| <b>Cereals</b>                           | 12.91            | 2.985           | 52              | 0.79         | -                 | -                | 0.007              | 0.731          | 0.26                  |
| % contribution<br>of cereals             | 1.388            | 7.85            | 0.9             | 2.3          | -                 | -                | 2.07               | 17.9           | 0.439                 |
| <b>Palm oil</b>                          | 156.15           | -               | -               | -            | 3018.5            | 94.71            | -                  | -              | -                     |
| % contribution<br>of palm oil            | 16.79            | 81.63           | -               | -            | 82.16             | 9.39             | 5.83               | -              | -                     |
| <b>Total</b>                             | <b>97.0</b>      | <b>82.63</b>    | <b>56.5</b>     | <b>34.35</b> | <b>87.62</b>      | <b>18.79</b>     | <b>88.09</b>       | <b>180.9</b>   | <b>85.90</b>          |

Table 9b showed that total energy intake of children aged 3-5 years was 1542.40kcal which gave 99.50% of the Recommended Daily Intake. Out of this starchy roots/tubers contributed 22.90% (353.13g) vegetable contributed 1.23% (18.96g), Nuts

and seeds contributed 2.84% (44.6Ig). 21.55% (332.24g) was contributed from legumes. Cereal contributed 31.14% (488.66g). Palm oil contributed to 0.84% (202.08g).

Total protein intake 44.28g which gave 273.33% of the recommend daily Intake. Out of this, starchy roots/tubers contributed 11.25% (4.98g), 3.88% (1.72g) was contribution from vegetable. Nuts and seeds contributed 4.09% (1.8lg) legumes contributed to 49.05% (21.72g). Cereals contributed to 26.24% (11.62g). There was no protein contribution from palm oil.

Total calcium intake was 398.26g which gave 88.5% of Recommended Daily Intake. Out of which starchy roots/tubers contributed 18.46% (73.52g). Vegetable contributed 16.76% (66.88g). Nut and seeds contributed to 2.41% (9.6g), legumes contributed 16% (63.74g) and cereal 5.63% (22.43g). Palm oil made no contribution.

Total iron intake of children 3-5 years was 31.97g which gave 456.7% of the Recommended Daily Intake. Out of this starchy roots and tubers contributed to 19.55% (6.25g), vegetable contributed to 4.707% (1.505g) 6.537% (2.09g) was contributed made by nuts and seeds. Legumes contributed 26.33% (8.42g). Cereal contributed 26.43% (8.45g). None from palm oil.

Total vitamin A intake was 3826.17g which gave 3079.46% of the Recommended Daily Intake. Out of which starchy root/tubers contributed nothing. Vegetable contributed 6.76% (832.07). Legume contributed 0.52% (20.012g). Nuts and seed made no contribution and cereal contributed to 0.35% (13.58g). Palm oil contributed to 0.20% (7.52g).

Thiamine intake was 1.93g which gave 0.7% of the Recommended Daily Intake. Out of which starchy roots/tubers contributed to 18.29% (0.353g) vegetable contributed was 3.16% (0.061g), Nut and seeds 34.20% (.66g), legumes gave 24.09% (0.46g) and cereals gave 14.82% (0.29g). Palm oil did not contribute anything.

Riboflavin intake was 10.73g, which gave 181.0% of the Recommended Daily Intake. Out of which starchy roots/tubers contributed 0.13% (0.014g), vegetable contributed 7.82% (0.06g). Nuts and seeds contributed to 2.14% (0.23g), legumes gave 17.12% (0.25g) and cereal 4.73 (0.07g).

Total Niacin intake was 7.91g which gave 141.59% of the Recommended Daily Intake. Out of which starchy roots and tubers contributed 28.57% (2.26g) vegetable

contributed 5.75% (0.46g) Nut and seeds gave 1.01% (0.08g) legumes gave 21.11% (1.67g) and cereals contributed 39.95% (3.16g).

Total ascorbic acid intakes was 69.32g which gave 346.6% of the Recommended Daily Intake. Out of this starchy roots/tubers gave 40.73% (28.24g) vegetable gave 36.43% (39.72g). Others contributed nothing.

**Table 9b: Nutrient intakes and contribution of traditional food to mean daily intake of children aged 3-5 years in Ohuhu and Ohiya communities.**

|                                          | Energy<br>(kcal) | Protein<br>(gm) | Calcium<br>(mg) | Iron<br>(mg) | Vitamin<br>A (RE) | Thiamine<br>(mg) | Riboflavin<br>(mg) | Niacin<br>(mg) | Ascorbic<br>Acid (mg) |
|------------------------------------------|------------------|-----------------|-----------------|--------------|-------------------|------------------|--------------------|----------------|-----------------------|
| Total intake                             | 1542.40          | 44.28           | 398.26          | 31.97        | 3826.17           | 1.93             | 10.73              | 7.91           | 69.32                 |
| FAO/WHO<br>Requirements                  | 1550             | 16.2            | 400.500         | 7            | 400               | 0.7              | 0.9                | 11.2           | 20                    |
| % intake of<br>requirement               | 99.50            | 273.33          | 88.50           | 456.7        | 3079.46           | 275.71           | 181.0              | 141.59         | 346.6                 |
| <b>Starchy<br/>root/tubers</b>           | 353.13           | 4.98            | 73.52           | 6.25         | -                 | 0.353            | 0.014              | 2.26           | 28.24                 |
| % contribution<br>of roots and<br>tubers | 22.89            | 11.34           | 18.46           | 19.55        | -                 | 18.29            | 0.13               | 28.57          | 40.73                 |
| <b>Vegetables</b>                        | 18.96            | 1.72            | 66.88           | 1.505        | 832.07            | 0.061            | 0.06               | 0.46           | 39.43                 |
| % contribution<br>of vegetable           | 1.22             | 3.88            | 16.76           | 4.707        | 6.76              | 3.16             | 7.82               | 5.75           | 36.43                 |
| <b>Nuts and seeds</b>                    | 44.61            | 1.81            | 9.60            | 2.09         | -                 | 0.66             | 0.23               | 0.08           | -                     |
| % contribution<br>of fruits and<br>seeds | 2.84             | 4.09            | 2.41            | 6.537        | -                 | 34.19            | 2.19               | 1.01           | -                     |
| <b>Legumes</b>                           | 332.24           | 21.72           | 63.74           | 8.42         | 20.012            | 0.46             | 0.25               | 1.67           | -                     |
| % contribution<br>of legumes             | 21.16            | 49.05           | 16.00           | 26.33        | 0.52              | 24.09            | 17.12              | 21.11          | -                     |
| <b>Cereals</b>                           | 488.66           | 11.62           | 22.43           | 8.45         | 13.58             | 0.29             | 0.07               | 3.16           | -                     |
| % contribution<br>of cereals             | 31.14            | 25.42           | 5.63            | 26.63        | 0.35              | 14.82            | 4.73               | 39.95          | -                     |
| <b>Palm oil</b>                          | 202              | -               | -               | -            | 7.52              | -                | -                  | -              | -                     |
| % contribution<br>of palm oil            | 13.10            | -               | -               | -            | 0.19              | -                | -                  | -              | -                     |
| <b>Total</b>                             | <b>92.35</b>     | <b>93.76</b>    | <b>59.26</b>    | <b>83.75</b> | <b>7.82</b>       | <b>94.5</b>      | <b>31.94</b>       | <b>94.3</b>    | <b>77.16</b>          |

Table 9c total energy requirement of children aged 6-12 years was 1027.94g which gave 52.67% of the Recommended Daily Intake. Out of this starchy roots/tubers contribution was 29.7% (305.67g), vegetable contribution was 2.09% (21.5g) Nuts and seeds was 5.0%

(51.48g). Legumes was 23.9% (246.0g), cereals contribution was 18.6% (191.08g) and palm oil contribution was 16.2% (166.05g).

Protein intake was 26.94g which gave 36.9% of Recommended Daily Intake. Out of this, starchy roots/tuber contribution was 10.2% (2.76g) vegetables gave 7.5% (2.02g). Nuts and seeds gave 8.9% (2.4g). Legumes 44.1% (11.88g) and cereals 17.1% (4.62g).

Calcium intake was 272.42g which gave 49.53% of Recommended Daily Intake. Out of this, starchy roots/tubers contribution was 9.9% (26.98g). Vegetable contribution was 16.7% (45.45g). Nuts and seeds gave 4.6% (12.59g). Legumes contributed to 18.2% (49.71g) and cereals 3.3% (9.06g). Palm oil did not make any contribution.

Iron intake was 12.15g which gave 75.94% of the Recommended Daily Intake. Starchy roots/tubers contribution was 12.3% (1.49g) vegetable contribution was 13.3% (1.62g). Nuts and seeds contribution was 11.1% (1.35g) legumes 37.9% (4.6g) and cereals 10.8% (1.31g).

Vitamin A intake was 4948.58g which gave 1099.7% of the Recommended Daily Intake. Out of this, starchy roots/tubers contribution was 0.35% (17.14g). Vegetables 13.9% (689.03g), Legumes contribution was 0.22% (10.72g) and cereals was 0.3% (1.67g). Palm oil contributed to 74.6% (3690g). Nuts and seeds made no contribution.

Thiamine intake was 1.05g which gave 123.5% of the Recommended Daily Intake. Out of this, starchy roots/tuber contribution was 14.1% (0.15g). Vegetable was 34.8% (0.36g), Nuts and seeds contribution was 1.4% (0.02g). Legume was 35.7% (0.38g) and cereals 13.4% (0.14g).

Riboflavin intake was 0.47g which gave 39.17% of the Recommended Daily Intake. Out of this, starchy roots/tubers contribution was 12.76% (0.06g). Vegetables was 31.9% (0.15g) Nuts and seeds contributed 29.79% (0.14). Legumes contribution was 17.9 (0.09g) and cereals was 5.5% (0.03),

Niacin intake was 4.75g which gave 33.93% of the Recommended Daily Intake. Out of this, starchy roots/tubers was 23.6% (1.12g), vegetable was 10.4% (0.5g) Nuts and seeds 2.55% (0.12g) legumes contributed 28.4% (1.35g) and cereals 25.9% (1.23g).

Ascorbic acid intake was 101.94g which gave 407.8% of the Recommended Daily Intake. Out of this, starchy roots/tubers contributed 53.9% (56.56g). Vegetables contributed 25.6% (26.14g) and cereals contributed 0.31 % (0.32g). No contributions from nuts/seeds and legume.

**Table 9c: Nutrient intakes and contribution of traditional foods to mean daily intake of children aged 6-12 years in the two communities.**

|                                          | Energy<br>(kcal) | Protein<br>(gm) | Calcium<br>(mg) | Iron<br>(mg) | Vitamin<br>A (RE) | Thiamine<br>(mg) | Riboflavin<br>(mg) | Niacin<br>(mg) | Ascorbic<br>Acid (mg) |
|------------------------------------------|------------------|-----------------|-----------------|--------------|-------------------|------------------|--------------------|----------------|-----------------------|
| Total intake                             | 1027.94          | 26.94           | 272.42          | 12.15        | 4948.58           | 1.05             | 0.47               | 4.75           | 101.95                |
| FAO/WHO<br>Requirements                  | 1950             | 31              | 550             | 16           | 450               | 0.85             | 1.2                | 14.0           | 25                    |
| % intake of<br>requirement               | 52.67            | 36.90           | 49.53           | 75.94        | 1009.7            | 123.5            | 39.17              | 33.93          | 407.8                 |
| <b>Starchy<br/>root/tubers</b>           | 305.67           | 2.76            | 26.98           | 1.49         | 17.41             | 0.15             | 0.06               | 1.12           | 56.56                 |
| % contribution<br>of roots and<br>tubers | 29.7             | 10.2            | 9.9             | 12.3         | 0.35              | 14.1             | 12.76              | 23.6           | 53.9                  |
| <b>Vegetables</b>                        | 21.5             | 2.02            | 45.45           | 1.62         | 689.03            | 0.36             | 0.150              | 0.5            | 26.14                 |
| % contribution<br>of vegetable           | 2.09             | 7.58            | 16.7            | 13.3         | 13.9              | 34.8             | 31.9               | 10.4           | 25.6                  |
| <b>Nuts and seeds</b>                    | 51.48            | 2.40            | 12.59           | 1.35         | 0                 | 0.02             | 0.14               | 0.12           | -                     |
| % contribution<br>of fruits and<br>seeds | 5.0              | 8.9             | 4.6             | 11.1         | -                 | 1.4              | 29.76              | 2.52           | -                     |
| <b>Legumes</b>                           | 246.01           | 11.88           | 49.71           | 4.60         | 10.72             | 0.38             | 0.09               | 1.35           | -                     |
| % contribution<br>of legumes             | 23.9             | 44.1            | 18.2            | 37.9         | 0.22              | 35.7             | 17.9               | 28.4           | -                     |
| <b>Cereals</b>                           | 191.08           | 4.62            | 9.06            | 1.31         | 1.67              | 0.14             | 0.03               | 1.23           | 0.32                  |
| % contribution<br>of cereals             | 18.6             | 17.1            | 3.3             | 10.8         | 0.3               | 13.4             | 5.5                | 25.9           | 0.32                  |
| <b>Palm oil</b>                          | 166.05           | -               | -               | -            | 3690              | -                | -                  | -              | -                     |
| % contribution<br>of palm oil            | 16.2             | -               | -               | -            | 74.6              | -                | -                  | -              | -                     |
| <b>Total</b>                             | <b>95.45</b>     | <b>87.8</b>     | <b>52.7</b>     | <b>85.4</b>  | <b>89.37</b>      | <b>99.4</b>      | <b>97.52</b>       | <b>90.82</b>   | <b>79.81</b>          |

Table 9d showed total energy of mothers in the study communities was 1813.09g which gave 82.41% of the Recommended Daily Intake. Out of this starch roots/tubers

contributed 27.44% (497.5g), vegetable contributed to 1.53% (27.8g). Nuts and seeds contributed 4.76% (86.92g), legumes gave 24.05% (436.1 Ig) cereals 24.54 (445g) and palm oil contributed 13.94% (252g).

Total protein intake was 51.14g which gave 176.34% of recommended daily Intake. Out of this starchy roots/tubers contributed 9.75% (4.99g), vegetables 3.77% (1.93g), Nuts and seeds contributed 9.84% (5.08g). Legumes contributed 50.96% (26.06g) cereals contributed to 20.39% (10.43g). Calcium intake was 424.48g which gave 84.8% of the Recommended Daily Intake. Out of this starchy roots/tubers contributed 19.4% (82.34g) vegetable contributed 4.28% (18.21g). Nuts and seeds contributed 4.68% (19.88g). Legumes contributed 22.01% (93.42g) cereals gave 5.07% (21.53g)

Iron intake was 23.07g which gave 161.55% of the Recommended Daily Intake. Out of this starchy roots/tubers gave 12.78% (2.95g). Vegetable contributed 8.02% (1.85g). Nuts and seeds contributed 11.27% (2.6g). Legumes contributed 35.28% (8.14g) cereals 16.34% (3.77g).

Vitamin A intake was 9495.26g which gave 1899.05% of the Recommended Daily Intake. Out of this, starchy roots/tubers contributed 0.26% (24.4Ig). Vegetable contributed 8.76% (831.66g). Legumes contributed 0.32% (30.73g), cereals contributed 0.38% (35.93g). Palm oil contributed 58.98% (5600g). Nuts and seeds made no contribution.

Thiamine intake was 1.39g which gave 154.4% of the Recommended Daily Intake. Out of this, starchy roots/tubers gave 18.13% (0.25g). Vegetables gave 7.19% (0.1g) seeds and Nuts contributed to 1.58% (0.02g) legumes gave 53.24% (0.74g) and cereals 14.67% (0.35g).

Riboflavin intake was 0.79g which gave 60.77% of the Recommended Daily Intake. Out of this, starchy roots/tubers contributed to 14.56% (0.12g), vegetable contributed to 24.05% (0.19g). Nuts and seeds contributed to 0.12% (0.09Ig). Legumes 24.05% (0.19g) and cereals 26.58% (0.21 g).

Niacin intake was 7.29g which gave 50.27% of the Recommended Daily Intake. Out of this starch roots/tubers contribution was 25.02% (1.863g) vegetable contribution was 7.53% (0.55g). Nuts and seeds contribution was 3.62% (0.26g) legumes contribution was 33.47% (2.44g) and cereals contributed 24.45% (33.49g).

Ascorbic acid intake was 740.65g which gave 78.62% of the Recommended Daily Intake. Out of this, starchy roots/tubers contributed 55.9% (78.62g). Vegetable

contributed 3.97% (29.4g). Nuts and seeds contributed 0.04% (0.28g), legumes contributed 0.3% (2.37g) and 0.26% (1.96g) was contribution made by cereal. Palm oil made no contribution.

**Table 9d: Nutrient intakes and contribution of traditional food to mean daily intake of mothers in Ohuhu and Ohiya communities.**

|                                          | Energy<br>(kcal) | Protein<br>(gm) | Calcium<br>(mg) | Iron<br>(mg) | Vitamin<br>A (RE) | Thiamine<br>(mg) | Riboflavin<br>(mg) | Niacin<br>(mg) | Ascorbic<br>Acid (mg) |
|------------------------------------------|------------------|-----------------|-----------------|--------------|-------------------|------------------|--------------------|----------------|-----------------------|
| Total intake                             | 1813.09          | 51.14           | 424.48          | 23.07        | 9495.26           | 1.39             | 0.79               | 7.29           | 740.65                |
| FAO/WHO<br>Requirements                  | 2200             | 29              | 500             | 14.28        | 500               | 0.9              | 1.3                | 14.5           | 468.83                |
| % intake of<br>requirement               | 82.41            | 176.34          | 84.8            | 161.55       | 1899.05           | 154.4            | 60.77              | 50.27          | 78.62                 |
| <b>Starchy</b>                           |                  |                 |                 |              |                   |                  |                    |                |                       |
| <b>root/tubers</b>                       | 497.5            | 4.99            | 82.34           | 2.95         | 24.41             | 0.25             | 0.12               | 1.863          | 78.62                 |
| % contribution<br>of roots and<br>tubers | 27.43            | 9.75            | 19.40           | 12.78        | 0.26              | 18.13            | 14.56              | 25.02          | 55.9                  |
| <b>Vegetables</b>                        | 27.80            | 1.93            | 18.21           | 1.85         | 831.66            | 0.1              | 0.19               | 0.55           | 29.40                 |
| % contribution<br>of vegetable           | 1.53             | 3.77            | 4.28            | 8.02         | 8.76              | 7.19             | 24.05              | 7.53           | 3.97                  |
| <b>Nuts and seeds</b>                    | 86.92            | 5.08            | 19.88           | 2.60         | -                 | 0.2              | 0.091              | 0.26           | 0.28                  |
| % contribution<br>of fruits and<br>seeds | 4.76             | 9.84            | 4.68            | 11.27        | -                 | 1.58             | 0.12               | 3.62           | 0.20                  |
| <b>Legumes</b>                           | 436.11           | 26.06           | 93.42           | 8.14         | 30.73             | 0.74             | 0.19               | 2.44           | 2.37                  |
| % contribution<br>of legumes             | 24.05            | 50.96           | 22.01           | 35.28        | 0.32              | 53.24            | 24.05              | 33.4           | 0.3                   |
| <b>Cereals</b>                           | 445              | 10.43           | 21.53           | 3.77         | 35.93             | 0.35             | 0.21               | 33.49          | 1.96                  |
| % contribution<br>of cereals             | 24.54            | 20.39           | 5.07            | 16.34        | 0.38              | 14.67            | 26.58              | 24.45          | 0.26                  |
| <b>Palm oil</b>                          | 252              | -               | -               | -            | 5600              | -                | -                  | -              | -                     |
| % contribution<br>of palm oil            | 13.94            | -               | -               | -            | 58.98             | -                | -                  | -              | -                     |
| <b>Total</b>                             | <b>99.68</b>     | <b>94.7</b>     | <b>55.44</b>    | <b>83.69</b> | <b>68.7</b>       | <b>64.81</b>     | <b>94.81</b>       | <b>94.02</b>   | <b>60.63</b>          |

## CHAPTER FIVE

## DISCUSSIONS

### 5.1 Focus Group Discussion

The Ohiya and Ohuhu communities still practice the old tradition of farming. This is because the men solely cultivate yam and the women inter plant vegetables and corn in the farm. They also retain the tradition of harvesting yam for women to cook and feed the family. The men use ji-igwe (*Dioscorea rotundata*) for new yam festival for two reasons:- firstly to maintain tradition, secondly, it is the only variety of yam that is most available and popular during the specific festival. The families consumed cocoyam when cassava and yam are in short supply. The observation agreed with Nwagbo *et al.* (1987).

The two communities based their foods on cereals and tubers. This present observation was reported by Okeke (2001). The food habits in the communities are influenced by culture, belief as well as the availability of foods. Food consumption is particularly based on food value the medicinal and socio-cultural factors equally play a strong role on food habits. Food preferences for the communities are influenced by availability and affordability. Kirk-Meyer and Matt, (2000) observed that organoleptic attributes of foods determine the level of consumption of a particular food. Vegetables and fruits which are most abundant and available in home gardens form part of most traditional recipes and add value to traditional people's diet (Okeke *et al.*, 1993).

The income of the people determines the type of food choices of Ohuhu and Ohiya communities. Members of the communities in the present study are subsistence farmers who grow the bulk of their food in their home gardens and outlying field farms at varying distances from the home. In addition, most food items are purchased once every four day market week. These include meat, fish, crayfish and other soup ingredients and miscellaneous items like soap. The quantity of food produced is at a subsistent level, with poor farm input e.g. equipment and fertilizers.

It was because of rural-to-urban migration that farming was left to old men and women as has been indicated by Okigbo (1982), eventually leading to low yield which had to be sold to solve needs other than nutritional ones. Thus, local households had yet lower consumptions of available foods. This point agrees with WHO (2003), which reports that indigenous people face potential loss of knowledge of their nutritious traditional food practices due to lack of use by younger generation of the society and gradual loss of members of the communities who knew much about these indigenous and traditional food's.

## **5.2 Common Dishes Consumed by Indigenous People of Ohuhu and Ohiya and their Methods of Food Preparation.**

Cooking techniques are by boiling in water, steaming, for example, yam foo foo, cassava chips (boiled, sliced into chips, stipped overnight and washed), corn, the cob, corn starch, pottage and cocoyam. Food steamed are moi moi (*Cowpea cake*) and corn cake. Akara (*Bean cake*) balls (fried cowpea paste), yam, plantain or potatoes are fried in deep or shallow palm oil, bleached or unbleached. Yam or pears (*Dacroydes edulis*) are toasted or roasted. The primary sources of cooking fuel are wood - ninety percent (90%) and ten percent (10%) of the households use kerosene. The study shows that women in all the communities and especially in Igbo land, plan, influence and implement decisions about what the family eats. This point disagrees with Ojofeitimi *et al.* (1997), which claimed that mothers did not know that diet had anything to do with the prevention and control of anaemia, growth and well being of their children.

Some food preparation practices have a different implication for nutrient contributions of food eaten. Rice is washed three or more times before its final cooking stage. Village people appreciate white rice better than brown rice. Other foods are over cooked or cooked in large quantities of water, vegetables are over cooked and some vegetables are chopped before washing, thereby draining the nutrient away. These food preparation methods reduce valuable nutrients present in the food. This study agrees with Hirsch (2005), who reported that food fad/fallacies like personal likes/dislikes significantly influence food selection and preparation as some people still parboil vegetables before using them to cook. Fresh corn, pineapples, oranges, young odudu (*African yam beans*), garri and pear form most of their mid-lunch food in the study areas. Most of these mid-day meal are collected from the farm and when they come back, they use it as they wait to cook their night meal.

## **5.3 24-Hours Dietary Recall**

The 24 hours dietary recall further confirmed that the Ohiya community subjects were farmers and consumed most of what they produced in their farms such as cassava, yam, maize, cocoyam. African yam beans etc. The consumption of oil bean, potatoes, rice, beans, by the subjects is another confirmation that they very much like traditional foods and actually prefer them to imported foods.

They consume these traditional foods because they have become used to them from childhood. The younger age group do not know most of these traditional foods.

Ibe (1994) reports that it is difficult for people to change their food habits. Ohuhu subjects consume cassava, yam cocoyam, maize, African yam, beans, etc as in Ohiya. The comparable food habits of both Ohuhu and Ohiya communities is easy to explain. These two communities are very close and share common culture and food habits. The subjects consume high density energy foods because they work in farms and engage in other energy demanding activities such as, walking long distant paths to fetch water, walking to the market and to other social activities. Most of their breakfast food items are remnant of their night meal. Furthermore, most of the left over from the morning meals are also used as afternoon meals. The ability to cook different kinds of dishes in the morning, afternoon and night depends on the income of individual households.

#### **5.4 Consumption of Key Micronutrient Rich Foods**

This study shows the frequency of intake of various foods in the sample studied. It is clear that starchy staples are important in the diet of Ohuhu and Ohiya communities in Abia State – Nigeria. These foods are consumed in varieties of forms at least once .a day. Crayfish and dry fish are the main sources of protein. The quantity consumed at any meal may be as low as 2-20gm; they are included in the same table in the recipe for soup preparation. Consumption of meat, milk, eggs and poultry was extremely low, once a week. Majority of the adults in the study communities believe that egg causes children to steal and that milk is food for the infant. This study agrees with Oluranti (1997), who said that it was superstitiously believed that many Nigerian communities do not give eggs and meat to their children because it will make them to steal. The communities selected foods for the following reasons, as elicited from the questionnaire: preference, availability, cost and availability of fuel. These communities concentrate on familiar foods and tastes and cheapness for food. Consequently, starchy staples are mainly consumed by the respondents.

#### **5.5 General Interview**

High taste for most animal foods by the subjects was because they know the function of protein in the body. On the other hand, the low acceptance of pork is because of the high level of fat and oils. The present report agrees with that of Kirk-Mayer and Matt (2000), who reports that food attributes affect the consumption of a particular food.

The high legume acceptability by the subjects is because they know that legumes are cheap good sources of protein and are locally available. It was surprising that only

32% of the children in Ohiya very much liked soya beans, 34% of the adults liked it in Ohiya while children in Ohuhu were very indifferent to soya beans (44%) and only 20% of the adults liked soya beans despite the most recent campaign to promote the use of soya beans, whose protein is comparable to that of animal protein. This may be due to the rigorous processing methods required to prepare it.

Low acceptability and consumption of pumpkin by the communities might be due to its high moisture and low energy density. Legumes, starchy roots and cereals were the main staples because as farmers they cultivate more of these crops. The high preference for oha (*Pterocarpus soyauxii*) and achalla (*Cymogon citrate*) soup with foo-foo, to any other soup in the two communities of Abia State (Ohuhu and Ohiya), is because it does not cause any stomach discomfort after consumption, is high in fibre and is equally cheap.

This agrees with the reports of Hursch (2005), which shows that food attributes influence the level of acceptance and consumption of particular foods. The comparable taste score of children and those of their mothers suggest strongly that mothers determine the food habits of the family. This observation agrees with the earlier report that children adopt the food habits of their parents, especially mothers who take major decisions regarding food choices. Mothers are in charge of purchasing and preparing foods (ACC/SCN, 1990), and want their children to consume what is offered. The high acceptance of meat 55%, kidney 60%, milk 75%, egg 40% (animal food) in Ohiya community, in Abia State further confirms that the subjects know that animal foods are rich sources of protein that build and repair worn out tissues.

The hard-to-cook nature of African yam beans/akidi, is the reason the mothers who do not accept these legume advance. The failure by mothers to include these legumes in their diets further account for the poor nutritional status of the subjects: However, fruits, vegetables and other foods are well accepted by the subject. These foods are readily available in farms, markets and home gardens. Seasonality appears to be a major constraint for all year round consumption of these foods known to be a factor that guides food preference and choices (Ene-Obong, 2001). Consumption of vegetables, legumes, and fruits is the most sustainable way to reduce and control nutrient deficiencies in communities with poor resources (WHO, 1993).

The characteristics attributed to the food items surveyed were based on the nutrient content of the food, effect on child, child's response to the food, availability and

affordability by the people. Animal foods and legumes are known to mothers in Ohuhu and Ohiya communities in Abia State as blood building and equally as good source of protein. This is not surprising as they are informed in health centres during antenatal clinics in their nutrition education sessions. This confirms that antenatal clinics are good - forums for mothers to obtain health information for their families. This strongly suggests that nutritionists should use such medium to disseminate information on nutrition and health to the families.

Fruits and vegetables are most highly accepted by the indigenous people as good sources of nutrients for blood and vitamins. These mothers acquire the nutritional knowledge during antenatal clinics where they are advised to consume fruits and vegetable to improve their blood chemistry and their health in general. They were told that vitamins could combat infection in their bodies and improve their health.

## **5.6 Infant Feeding Practices**

The high rate of traditional practices, long period of breastfeeding from infancy to second year observed in Ohuhu and Ohiya communities shows that the campaign for exclusive breastfeeding was not adhered to. The none-practice of exclusive breastfeeding at any point by these subjects is in line with an earlier study (Okeke, 1988). The author found out that over 15% of mothers breastfed their babies for varying lengths of time. Majority of the mothers breast fed for one year, however, some women continued for two years. There is a confirmation of mixed feeding with the traditional practice where mothers breastfed their children for up to 2 years. This might be due to mothers being involved in commercial activities outside the home and away from their babies. Industrialization is known to change both food habit and life style (WHO, 2003). Majority of mothers gave their babies colostrum, few gave only breast milk. The reason for the later action is that the colostrum (initial breast milk), is unhealthy for the new infant. Majority of the mothers wean their babies off breast milk between 10 months - 12 months, although some still breastfed till 2 years. The study also found out that inspite of the campaign against the use of bottle feeding and artificial milk, some mothers still feed artificial milk to their babies as early as within the first one month of life. This study agrees with Okeke (1988) who reported that some mothers give artificial milk to their new born as early as in the first month of life. Breast milk is the best food for babies for the first six months of life.

### **5.7 Nutritional Status of the Children 0-12 years**

Inadequacy existed as a result of interaction between diet and nutritional requirement. Stunting appeared to indicate the presence of longstanding under nutrition among children aged 3-5 years in Ohuhu (20%) and Ohiya (1%).

Generally, it was discovered through this study that 6.5% of children aged 6-9 years are under weight in Ohuhu community in Abia State. This finding is in line with the report by Shenkin (1997), that children are underweight and short in height as a result of poor micronutrient out comes which prevent growth up to their genetic potential.

Despite the few cases of malnutrition, seen in other areas of the country, about 87%, 86%, 93% of children in both communities were normal as determined by weight-for-age, length-for-age and weight-for-height indicators for 0-12 years.

The existence of some level of malnutrition in Ohuhu among children aged 6-9 years (wasting, underweight and stunting), in this study agrees with the report of Tomkins and Waston (1993). The report observes that many children are underweight, short or thin due to under nutrition. The poverty level especially in communities militates against their ability to purchase high quality foods to achieve optimal nutrition. This study points out that poverty is a major factor that impedes against adequate nutrition. Poverty and malnutrition are very high in developing countries, and Nigeria is evidently one (WHO, 2000).

The level of malnutrition observed in Ohiya was much lower than that in Ohuhu. In Ohuhu, the number of children who were underweight were distributed thus: 3% (0-2 years), 3% (3-5 years), 1.5% (6-9 years) and 1% (10-12 years) while in Ohiya, the distribution was thus: .5% (0-2 years), .5% (3-5 years), .5% (6-9 years) and 1% (10-12 years). This may be due to the level of education of the subjects who may have been exposed to nutrition education and are thus able to practice prudent food choice and good child upbringing.

### **5.8 Proximate Composition of some Indigenous Foods**

Indigenous vegetables are micronutrient rich. Thus, increased vegetable consumption is a low-cost way which many rural communities adopt in improving their micronutrient needs. Pumpkin which has protein content of 22.8g, utazi 18.0g, ugu 14.8g, olima seed 14.7g, onugbu 14.6g waterleaf 12.4 are also used by the indigenous people in the treatment of anaemia and in cooking special dishes for women who are newly delivered of babies and for the sick.

## 5.9 Weighed Food Intake

The findings from weighed food intake shows that traditional foods provide over 80% of calories, protein, vitamins, thiamin, riboflavin, niacin and ascorbic acid for 0-2 years, 3-5 years and 6-12 years. It confirms that indigenes prefer to consume traditional foods to imported foods. It confirms further that indigenous people have a vast knowledge of food to consume in order to maintain good health (Kuhlein, 2003).

The children aged 0-2 years met their protein, vitamin A, thiamine and ascorbic acid requirement because most of them are breastfed for a relatively long period of time. This observation confirms that the indigenes have a wide variety of foods available to them.

The 0-2 years group consume and enjoy legumes as good source of calories, protein, iron, thiamine, riboflavin and niacin. The mothers are aware, and have a deep knowledge of nutritive values of legumes. They equally practicalise their nutrition education by offering diversified legume foods to their children for normal growth and good health.

In this study, the children aged between 3 and 5 years met their nutritional requirement for iron, protein, vitamin A, thiamine and ascorbic acid because their mothers had good knowledge of food and nutrition and applied it to select adequate diet for their families. These mothers also knew that as children grow older, family diet that contains varieties of food and nutrients are needed to maintain good nutritional growth. This explains why cereals provide most of their calories, iron and niacin. Nuts and seeds, fruits and vegetables as well as palm oil, significantly contribute most of the protein, thiamine, calories, iron, riboflavin and vitamin A in their diet. This work also shows, that as the children grow older and more active, their requirements become higher. The mothers pay much more attention to their infants and children. This explains the reason why the children aged 6-12 years met their requirements for vitamin A, thiamine, and ascorbic acid. However, this observation disagrees with that of children aged 6-7 years who are said to be at dietary risk of vitamin A deficiency in south eastern Nigeria.

## 5.10 Conclusion

The Igbo culture area has a wide variety of foods available for use. These foods have nutritional, medicinal and socio-cultural values. Starchy staples are very important

in the diet of the indigenes, although other foods such as vegetables, fruits and fish spices are also consumed. Other foods from other food groups are not left out. These commonly consumed foods make up an essential part of the everyday diet. However, some of these traditional foods are extinct and are no longer in use by the present generation. The communities whether or not they live in rural areas know the major nutrient sources and make best food choices in order to maintain good nutrition and foster ideal infant feeding options.

Poverty militates against good food choices, particularly in the rural areas. They sparingly consume animal foods due to high cost. In spite of high rate of malnutrition in other areas in the country, about 86%, 81% and 93.4% of children had normal nutrition and health as judged by weight-for-height, height-for-age and weight-for-age indicators respectively in both Ohiya and Ohuhu communities.

### **5.11 Recommendations**

1. Indigenous knowledge of vital foods are sadly diminishing at an alarming rate. There is an urgent need to retrieve it before it is irretrievably lost by putting in the school curriculum.
2. The traditional food system of indigenous people contains a wealth of micronutrients that have been poorly described and reported in scientific literature. This lack of scientific coverage prevents the information from being included in health training programmes. This problem can be solved by adding it as a course of study in school.
3. While indigenous peoples are often the most marginalized and disadvantaged sub groups of a population, their traditional knowledge and diverse food resources may be substantial enough to be used to improve their own micro-nutrient status.
4. There is need for computation of a baseline data in the nutrient composition table of known and lesser-known foods consumed especially in Igboland.
5. There is need for nutrition education to correct some of the fads and fallacies on traditional foods.

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## **APPENDICES**

## APPENDIX 1

### QUESTIONNAIRE ON FOOD SYSTEMS AND NUTRITIONAL STATUS OF INDIGENOUS PEOPLE IN FOUR COMMUNITIES IN ENUGU AND ANAMBRA STATE

#### SHORT LIST OF EXPECTED KEY MICRONUTRIENT-RICH TRADITIONAL FOODS TASTE SCORES AND RANKS BY CHILDREN AND ADULTS

Score each food general taste appreciation



Well liked



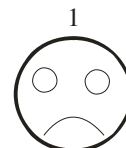
Liked



Indifferent



Not liked



Very not liked

| Traditional Food<br>Name/item | Children            |      |                     |      | Adult (age:_____) |       |
|-------------------------------|---------------------|------|---------------------|------|-------------------|-------|
|                               | Child 1 (age:_____) |      | Child 2 (age:_____) |      |                   |       |
|                               | Score               | Rank | Score               | Rank | Rank              | Score |
| 1.                            |                     |      |                     |      |                   |       |
| 2.                            |                     |      |                     |      |                   |       |
| 3.                            |                     |      |                     |      |                   |       |
| 4.                            |                     |      |                     |      |                   |       |
| 5.                            |                     |      |                     |      |                   |       |
| 6.                            |                     |      |                     |      |                   |       |
| 7.                            |                     |      |                     |      |                   |       |
| 8.                            |                     |      |                     |      |                   |       |
| 9.                            |                     |      |                     |      |                   |       |
| 10.                           |                     |      |                     |      |                   |       |
| 11.                           |                     |      |                     |      |                   |       |
| 12.                           |                     |      |                     |      |                   |       |
| 13.                           |                     |      |                     |      |                   |       |
| 14.                           |                     |      |                     |      |                   |       |
| 15.                           |                     |      |                     |      |                   |       |
| 16.                           |                     |      |                     |      |                   |       |
| 17.                           |                     |      |                     |      |                   |       |
| 18.                           |                     |      |                     |      |                   |       |
| 19.                           |                     |      |                     |      |                   |       |
| ...                           |                     |      |                     |      |                   |       |
| 30.                           |                     |      |                     |      |                   |       |

**Individual Report: Complementary Food Attributes for Infants ( $\leq 2$  Years).**


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**(Local traditional food short list of micronutrient-rich foods)**
**Respondent's Name** \_\_\_\_\_ **Respondent No.** \_\_\_\_\_

**Date:** \_\_\_\_\_ **Interviewer:** \_\_\_\_\_

| <b>Traditional Food Name/item</b> | <b>Attributes</b> |
|-----------------------------------|-------------------|
| 1.                                |                   |
| 2.                                |                   |
| 3.                                |                   |
| 4.                                |                   |
| 5.                                |                   |
| 6.                                |                   |
| 7.                                |                   |
| 8.                                |                   |
| 9.                                |                   |
| 10.                               |                   |
| 11.                               |                   |
| 12.                               |                   |
| 13.                               |                   |
| 14.                               |                   |
| 15.                               |                   |
| 16.                               |                   |
| 17.                               |                   |
| 18.                               |                   |
| 19.                               |                   |
| 20.                               |                   |
| 21.                               |                   |
| 22.                               |                   |
| 23.                               |                   |
| 24.                               |                   |
| 25.                               |                   |
| 26.                               |                   |
| 27.                               |                   |
| 28.                               |                   |
| 29.                               |                   |
| 30.                               |                   |

### Individual Report: Complementary Food Attributes for Infants (2 – 12 Years).

---

(Local traditional food short list of micronutrient-rich foods)

Respondent's Name \_\_\_\_\_ Respondent No. \_\_\_\_\_

Date: \_\_\_\_\_ Interviewer: \_\_\_\_\_

| Traditional Food Name/item | Attributes |
|----------------------------|------------|
| 1.                         |            |
| 2.                         |            |
| 3.                         |            |
| 4.                         |            |
| 5.                         |            |
| 6.                         |            |
| 7.                         |            |
| 8.                         |            |
| 9.                         |            |
| 10.                        |            |
| 11.                        |            |
| 12.                        |            |
| 13.                        |            |
| 14.                        |            |
| 15.                        |            |
| 16.                        |            |
| 17.                        |            |
| 18.                        |            |
| 19.                        |            |
| 20.                        |            |
| 21.                        |            |
| 22.                        |            |
| 23.                        |            |
| 24.                        |            |
| 25.                        |            |
| 26.                        |            |
| 27.                        |            |
| 28.                        |            |
| 29.                        |            |
| 30.                        |            |

**INFANT FOOD HISTORY (0-2 Years)****Mother's Name:****Number:****Village:****Interviewer:**\_\_\_\_\_ **Date:**\_\_\_\_\_**Child's Name:**\_\_\_\_\_ **Age of Child (months):**\_\_\_\_\_ **Gender (m or F)**

Did this child have colostrum? ( ) Yes ( ) No

Did this child have breast milk? ( ) Yes ( ) No

If child is currently breastfed, at what age does the mother plan on stopping breast  
Feeding? \_\_\_\_\_

What milk besides breast milk has this child received? At what age?

| <b>Type of Milk</b>      | <b>Not given? (if applicable)</b> | <b>Age that child first received this milk</b> | <b>Still received by child? (Yes/No)</b> | <b>Age that child stopped receiving this milk</b> |
|--------------------------|-----------------------------------|------------------------------------------------|------------------------------------------|---------------------------------------------------|
| Powdered milk<br>_____   |                                   |                                                |                                          |                                                   |
| Condensed milk<br>_____  |                                   |                                                |                                          |                                                   |
| Whole milk, UHT<br>_____ |                                   |                                                |                                          |                                                   |
| Soy milk<br>_____        |                                   |                                                |                                          |                                                   |
| Ovaltine/Milo<br>_____   |                                   |                                                |                                          |                                                   |
| Other<br>_____           |                                   |                                                |                                          |                                                   |

Continued...

5. When did the mother give the following supplementary foods to this child? OR if young infant, which foods does the mother plan to give, and when?

| <b>Age<br/>supplementary<br/>food was first<br/>given</b> | <b>Supplementary<br/>food group*</b> | <b>Preparation</b> | <b>Quantity per<br/>serving<br/>(tbsp)</b> | <b>Frequency of<br/>consumption<br/>(times/d, days/wk)</b> |
|-----------------------------------------------------------|--------------------------------------|--------------------|--------------------------------------------|------------------------------------------------------------|
|                                                           | Rice                                 |                    |                                            |                                                            |
|                                                           | Cerelac                              |                    |                                            |                                                            |
|                                                           | Banana                               |                    |                                            |                                                            |
|                                                           | Fish                                 |                    |                                            |                                                            |
|                                                           | Vegetable                            |                    |                                            |                                                            |
|                                                           | Pumpkin                              |                    |                                            |                                                            |
|                                                           | Egg                                  |                    |                                            |                                                            |
|                                                           | Fruit                                |                    |                                            |                                                            |
|                                                           | Chicken/Pork                         |                    |                                            |                                                            |
|                                                           | Liver                                |                    |                                            |                                                            |
|                                                           | (Fried food)                         |                    |                                            |                                                            |
|                                                           | Other                                |                    |                                            |                                                            |
|                                                           | Other                                |                    |                                            |                                                            |
|                                                           | Other                                |                    |                                            |                                                            |

\* Food examples from Thailand

## INDIVIDUAL 24 HOUR RECALL (INFANT, CHILD, ADULT)

**Note: Complete 2 24-hour recalls (use duplicate forms) for each respondent within one week.**

Name:\_\_\_\_\_ No:\_\_\_\_\_ Community:\_\_\_\_\_ Interviewer:\_\_\_\_\_

Gender: ( ) Male ( ) Female Age:\_\_\_\_\_

Status: ( ) Child 0-2yrs. ( ) Child 3-5yrs. ( ) Child 6-12yrs. ( ) Pregnant ( ) Lactating ( ) Non-pregnant adult

Self-identification: Indigenous:\_\_\_\_\_ Other:\_\_\_\_\_ (specify)

Today's Date:\_\_\_\_\_ (day/moth/year)

Day Recalled:\_\_\_\_\_ (day/month/year)

Was yesterday a "usual" day?: ( ) Yes ( ) No ( ) Sick ( ) Other (specify):\_\_\_\_\_

Do you take any vitamin/mineral supplements?: ( ) No ( ) Yes

If yes, please specify: Brand name:\_\_\_\_\_ Frequency of intake:\_\_\_\_\_

[illegible]

**Interviewer, did you remember to check about:** lard, butter, salad dressing, the milk/cream/sugar in the beverages, any juice alcohol, jam, honey...? Any snacks, beverages, or foods consumed out side the home? (Modify to fit your local food situation).

### Physical Health Questionnaire for Children 0-12 Year Old

1. Child's name: \_\_\_\_\_ Gender: ( ) Male Female ( ) Age: \_\_\_\_\_
2. Mother's name: \_\_\_\_\_ No: \_\_\_\_\_  
Date of interview: \_\_\_\_\_ (day/month/year)
3. Birth date: \_\_\_\_\_ source: ( ) Memory ( ) Birth Certificate ( ) Don't know (day/month/year)
4. Weight: \_\_\_\_\_ kg (Mother + Child \_\_\_\_\_ kg – Mother \_\_\_\_\_ kg)
5. Height/length: \_\_\_\_\_ cm
6. Has child ever had trouble seeing clearly when the light is dim? ( ) No, never ( ) Yes, but is now OK ( ) Yes, currently ( ) Don't know
7. Did mother ever have trouble seeing clearly when the light was dim when pregnant with this child? ( ) No, never ( ) No, never ( ) Yes ( ) Don't know
8. Clinical signs:

| Physical                                                                                         | Normal | Abnormal                                                    |
|--------------------------------------------------------------------------------------------------|--------|-------------------------------------------------------------|
| General physical health (PEM)                                                                    |        | ( ) Overweight<br>( ) Underweight                           |
| Hair (PEM)                                                                                       |        | ( ) Dry, Thin, falls out easily                             |
| Bottom eyelid (Fe)                                                                               |        | ( ) Pale                                                    |
| Mouth (vit B <sub>2</sub> )                                                                      |        | ( ) Wounds on sides of mouth<br>( ) Scare on sides of mouth |
| (For child 2-6 yrs only in the past month, have you noticed any bleeding during tooth brushing?) |        | ( ) yes<br>( ) Don't know                                   |
| Other (specify):                                                                                 |        |                                                             |

Nutritional Status (Tai) W/A: \_\_\_\_\_ H/A: \_\_\_\_\_ 1/H: \_\_\_\_\_

### KEY MICRONUTRIENT-RICH FOOD FREQUENCY FOR INFANTS, CHILDREN AND MOTHERS

Respondent No.:\_\_\_\_\_ Date:\_\_\_\_\_

Interviewer:\_\_\_\_\_

Name of Child:\_\_\_\_\_

Child's Age:\_\_\_\_\_ gender: ( ) Male ( ) Female

.....

Name of Women of Reproductive Age:\_\_\_\_\_

(circle one): Lactating Pregnant

Season on interview:\_\_\_\_\_

| Name of Traditional Food | Frequency of intake (date times per day, week or month) | Usual serving size | Rank* |  |  |
|--------------------------|---------------------------------------------------------|--------------------|-------|--|--|
| 1.                       |                                                         |                    |       |  |  |
| 2.                       |                                                         |                    |       |  |  |
| 3.                       |                                                         |                    |       |  |  |
| 4.                       |                                                         |                    |       |  |  |
| 5.                       |                                                         |                    |       |  |  |
| 6.                       |                                                         |                    |       |  |  |
| 7.                       |                                                         |                    |       |  |  |
| 8.                       |                                                         |                    |       |  |  |
| 9.                       |                                                         |                    |       |  |  |
| 10.                      |                                                         |                    |       |  |  |
| 11.                      |                                                         |                    |       |  |  |
| 12.                      |                                                         |                    |       |  |  |
| 13.                      |                                                         |                    |       |  |  |
| 14.                      |                                                         |                    |       |  |  |
| 15.                      |                                                         |                    |       |  |  |
| ...                      |                                                         |                    |       |  |  |
| 30.                      |                                                         |                    |       |  |  |

\* 0 = none

1 = low

3 = high

## APPENDIX II

### Focus Group Guide

1. Family size - [2-4] [5-7] [7 and above]
2. Employment or working pattern [Govt. Employment.....] [Private Orgn. employment.....]  
[Self employment.....]
3. Pattern of food harvest by household:  
Hired labour or household labour.
4. How is the food consumed? Consumed all/Sold some.
5. Preference for traditional food or modern market foods:  
Do you prefer traditional foods to modern market foods?
6. List all preferred traditional foods or foreign foods
7. List all non preferred traditional or foreign foods.
8. List all disliked traditional or foreign food.
9. Indicate non when applicable
10. Describe portions or parts not liked.
11. Health Attributes/benefits:  
Indicate various benefits derived from the following foods.....
12. Traditional foods that are problematic to health:  
Indicate various foods connected with the following: (a) Kwashiorkor (b) Scurvy  
(c) Running stomach (d) Running nose, coughs etc.
13. Availability of necessary traditional foods in the markets: List all the non-available traditional foods in your market.
14. Is there any sign of decrease in the consumption of traditional foods in your community  
Yes [ ] No [ ].
15. If yes above, give examples
16. Has the household sufficient financial resources to buy all their needed foods from the market.
17. If the household is no longer interested in consuming traditional foods, could the household afford to live on modern market foods.
18. Hunting/fishing cost:  
(a) Is hunting/fishing a beneficial trade? Yes [ ] No [ ]  
(b) If yes to the above, specify the cost of hunting/fishing
19. Diseases and foods. List the diseases  
Question: (a) Indicate the foods connected with these diseases  
(b) Indicate the foods connected with the reduction or total elimination of the diseases.
20. No of hours spent in watching TV during the farming seasons. Tick as appropriate:  
(a) 1-3  
(b) 4-6  
(c) 6 and above
21. Degree of consumption rate  
Indicate your degree of consumption rate  
(1) High-eating a lot  
(2) Medium - not too much nor too big  
(3) Low - does eat each meal
22. Positive attributes of the traditional foods already mentioned. List the attributes and the foods e.g. tick as appropriate
23. Mention any additional remarks

## APPENDIX III

## CALCULATION OF AVERAGE NUTRIENT INTAKE VS REQUIREMENTS

1. Case No. \_\_\_\_\_ 2. Age: \_\_\_\_\_ 3. Sex: M ( ) F ( ) 4. Weight: \_\_\_\_\_ kg 5. Height: \_\_\_\_\_ cm

[illegible]

## APPENDIX IV

### CALCULATION OF NUTRIENT INTAKE FOR DAY

[illegible]