HOUSEHOLD CONSUMPTION PREFERENCE FOR PLANT PROTEINS IN EKITI STATE, NIGERIA

BY

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DECLARATION

I **ODUTOLA, OPEYEMI ESTHER** hereby declare that this project titled "HOUSEHOLD CONSUMPTION PREFERENCE FOR PLANT PROTEINS IN NIGERIA, USING EKITI STATE AS A CASE STUDY" was written by me in the Department of Agricultural Economics and Extension, Federal University Oye-Ekiti, Ekiti state, Nigeria and that it was the record of my own research work. No part of this work has been presented in any previous work for an undergraduate degree in any University. Information obtained from the literature has been duly acknowledged in the project and a list of references provided.

Odutola Opeyemi Esther
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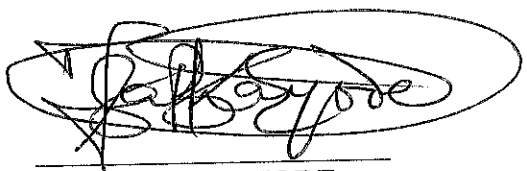
11/10/2016
Date

CERTIFICATION

This is to certify that this project titled **"HOUSEHOLD CONSUMPTION PREFERENCE FOR PLANT PROTEINS IN EKITI STATE, NIGERIA"** by ODUTOLA, Opeyemi Esther meets the regulation governing the award of the degree of Bachelor of Agriculture in Federal University Oye-Ekiti, Ekiti State and is approved for its contribution to knowledge and literary presentation.



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10/10/16
Date

DEDICATION

This project is dedicated to Almighty, the master of the Universe, whom out of His abundant mercy gave me the rare priviledge to reach this level of my academic pursuit.

It is dedicated In Loving Memory of my Mother – Mrs. K.O. Odutola and to everyone who sees Agriculture as a Business and not a way of Life.

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with the Lord and also my father - Mr.S.A Odutola whose love and care kept me moving higher.

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ABSTRACT

This research was undertaken to determine consumption preference between plant protein and animal protein sources by households in Nigeria, using Ekiti state as a case study and the variables that influenced the households' consumption preference between the two. The study methodology comprised a two stage sampling technique, which was used to survey 100 protein-consuming households across localities within the Ekiti State Agricultural Development Project Zones. Analytical tools used in the study include descriptive statistics and the multinomial logit model. The study revealed that the mean age of the households' heads was 42years, most (51%) of the households' heads are males, of which about 69% are married. Majority of the households' heads were Traders and mean monthly income of N55, 265.00. The mean per capita expenditure (**₦7649.50**) on animal protein source food (APSF) is greater than the per capita expenditures (**₦3667.00**) on plant protein source food (PPSF). The major factors that significantly influenced household preferences for combination of plant and animal protein sources were age, number of years spent in school, household size and number of income earners in the household while gender, number of years spent in school and number of income earners significantly influenced the household preference for animal protein only.

Keywords: Malnutrition, Proteins, Consumption, Consumer choices, Multinomial logit model.

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Food is a basic human need and a major source of nutrient for human existence (Olarinde and Kuponiyi, 2005). In Nigeria, most of her citizenry consume diets characterized by high starch content and low protein, yet excessive feeding on starchy foods has been found to cause malnutrition conditions (Yusuf, 2012). This stems from the fall out of the harsh economic condition that has become prevalent in the country. In his view, Elamin (2016) pointed out that in developing areas of the world, people often have diets low in energy and an attendant shortage of protein. People who consume too little protein and food energy can go on to develop Protein-Energy Malnutrition (PEM). The two most common forms of PEM, marasmus and kwashiorkor, occur in all developing countries and are life-threatening conditions (Elamin, 2016). The presence of malnutrition before 6 months of age is known to leave a permanent scar in the child's intelligence. Apart from infants and children alike, protein energy malnutrition (PEM) or protein calorie malnutrition (PCM) as it is sometimes called, is known to affect the physical development of individuals and job performance of the workforce in a nation, which in turn has a negative impact on the

nation's growth and development. It is also known to reduce adult capacities by reducing work attendance and output and even when work is done, it makes for a slow pace of work as a result of fatigued muscle (Elamin, 2016)

Children suffer from the effects of starvation more quickly than adults do. According to the United Nations Children's Fund (UNICEF, 2013), malnutrition contributes to the deaths of more than 6 million children under age five each year. For Nigeria, her dream of meeting up with the 2015 Millennium Development Goal (MDG) target of reducing by two-thirds, the proportion of under-five mortality rate per a thousand live births has become a mirage basically as a result of the state of the countrys' malnutrition crisis (National Planning Commission, 2005). This is more so in the rural areas.

Nigeria is one the most populous black nation in the World with the threat of nutritional deficiency facing its citizen because of poverty, high cost of protein foods and inadequate in-take of proteins (Durojaiye, 2001). A large proportion of the populace including children, do not consume enough calories to ensure sound physical health and development. Most people consume the minimum level of calorie but fail to get the necessary proteins, essential vitamins and minerals required for leading a healthy life (Olagunju, 2002). It has been estimated that 7300 children die of malnutrition annually in Nigeria before they reach the age of four years while between 73000 -84000 infant born every year suffer from malnutrition. In 1999, malnutrition

prevalence among children under 5 years was estimated at 27.3% while life expectancy at birth was estimated at 46.8 years in 2000. The main indicator of childhood malnutrition is stunting — when children are too short for their age. Stunted children have poor physical growth and brain development, preventing them from thriving and living up to their full potential (World Bank 2004: Ajayi and Chukwu 2008).

The aggregation of all these implications affects the economic growth of the nation in a negative way because a healthy and nutritionally well-fed population contributes positively to the national economic growth and development. There have been persistent reports of widespread malnutrition and food insecurity among Nigerians (Bamiro, 2011).

Nigeria is faced with a crisis of malnutrition. She ranks second behind India among countries with the highest number of stunted children (UNICEF, 2013). This is shown in Table 1.

Table 1 - Country's Malnutrition Ranking

Rank	Country	Value (%)	Year
1	India	43.90	2013
2	Nigeria	43.70	2013
3	Eritrea	39.40	2013
4	Bangladesh	38.80	2013

5	Niger	37.10	2013
6	Madagascar	34.50	2013
7	Yemen	33.70	2013
8	Afghanistan	33.00	2013
9	Somalia	31.30	2013
10	Cambodia	29.10	2013
10	Pakistan	29.10	2013
12	Timor-Leste	29.00	2013
13	Djibouti	28.50	2013
14	Nepal	28.40	2013
15	Chad	28.20	2013

Source: UNICEF, 2013

Each year about 1 million Nigerian children die before their 5th birthday. Malnutrition contributes to nearly half of this death (UN, 2013). Rates of stunting in Nigeria have stagnated for more than a decade. About 2 in 5 Nigerian children are stunted, with rates of stunting varying throughout the country (Black *et al,* 2013). Almost 30 percent of Nigerian children are underweight, meaning they do not weigh enough for their age. This is more than double the proportion of neighboring Ghanaian children who are underweight (NDHS, 2013). The percentage of children in Nigeria who are wasted, or too thin for their height, has steadily increased over the last decade, rising from

11percent in 2003 to 18 percent in 2013.Up to 1 million Nigerian children under age 5 are affected by severe acute malnutrition (SAM) each year (NDHS and GDHS, 2013). These children have severely low weight for their height and are at risk of dying unless given urgent attention (NDHS 2003 and 2013). Nearly 4 out of 5 Nigerian children do not meet the World Health Organization's recommendation for exclusive breastfeeding during the first 6 months of life (Children's Investment Fund Foundation, 2013). About 70 percent of children ages 6 to 23 months are not receiving the minimum acceptable diet (NDHS, 2013).

Aromolaran (2001) confirmed that Nigerians are struggling to meet up with the daily dietary requirement. The evidence of poor nutrition is reflected particularly among low-income group.

1.2 Statement of the Problem

Malnutrition and under nutrition are still problems of unacceptable proportions in many developing countries. Global surveys revealed that nearly one billion people mostly in developing countries (including Nigeria) are chronically undernourished, lacking sufficient food to live healthy and active lives . A healthy and nutritionally well-fed population is indispensable for attaining economic growth and development objectives of a nation yet there have been persistent reports of widespread malnutrition among Nigerians. Malnutrition in Nigeria has been linked to food shortages, both in terms of the quantity available and access to the right quality of food to provide

balanced diets. The greatest challenge facing policy makers in Nigeria is how to better Household's food nourishment in terms of the quality and quantity of diet in order to address the problem of nutritional imbalance of the nation's teeming population. Most emphasis has been on Protein intake not minding whether it is Animal or Plant proteins yet the debate in Literature are emphatical as to the role of the two protein types. Pan *et al,* 2013 noted that diets higher in animal protein, specifically in red meat, are associated with an increased incidence of Type 2 Diabetes; Hosseinpour-Niazi *et al,* 2014 revealed that substituting red meat with legumes reduces the risk of type 2 diabetes. In his own findings, Fung (2003) found that the health benefit of plant-based diets clearly outweighs that of a counterpart diet rich in animal-based products. These findings establishes the fact that Plant Proteins has a lot of benefits to the body also in terms of supporting the body's muscular system, promoting an alkaline environment and holding back on the amount of unhealthy fatty acids often found in animal protein food sources.

Given the critical need for the substitution of animal proteins with plant proteins sources for healthy living and food security of the majority of the nations malnourished citizenry, this study seeks to provide answers to the following nutrition security concerns in Nigeria.;

- Under what socio-economic circumstances do the Nigerian Households live vis-à-vis getting enough, quality protein and meet their daily protein needs?

- Which plant protein sources do these Households consume?
- How often do these Households consume Plant Protein sources in relation to Animal Protein sources?
- How much do the households spend on Plant and Animal protein foods?
- What variables influence the Consumption of Plant Proteins vis-à-vis their Animal Protein counterparts among the Households?

1.3 Objectives of the Study

The main objective of the study is to examine Households' Consumption Preference for Plant Proteins in Nigeria, using Ekiti state as a case study.

The specific objectives were to:

- examine the socio-economic characteristics of the households in the study area.
- profile plant protein sources consumed by Households.
- determine how often households consume plant protein sources
- determine the level of household expenditure on major plant and animal proteins sources.
- determine the variables influencing plant protein consumption in relation to animal protein sources among Households.

1.4 Justification of the Study

Food supply available for consumption in different countries shows that the protein intake in developing countries, Nigeria inclusive, is comparatively low. Not only is the total protein supply deficient but the quality of dietary protein available is inferior to that consumed in developed countries. Most of the foods consumed in Nigeria are carbohydrates, which are obtained mainly in the form of starch.

The outcome from this study will encourage people particularly the rural households to consume more proteins especially plant protein sources in their diets so as to be nutritionally balanced.

It is in view of these issues with plant protein consumption that this study focuses on determining the rate of consumption in the Households as well as to identify the socio-economic characteristics that influences protein consumption.

1.5 Plan of the Study

The remaining part of this study consists of four chapters as follows: Chapter Two which covers the review of relevant literatures; Chapter Three presents the research methodology and tools of analysis used in the study; Chapter four furnishes the discussion of the study's findings while Chapter Five is the Summary of the major findings; conclusions and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 History of Proteins

The word '**PROTEIN**' comes from Greek language (***prota***) which means "of primary importance" because of the fundamental role of proteins in sustaining life.

This name was introduced by Jons Jakob Berzelius in 1838 for large organic compounds with almost equivalent empirical formulas. This name was used because the studied organic compounds were primitive but seems to be very important for animal nutrition (Robert *et al*, 2000).

2.2 Definition of Protein

Protein is any of a class of nitrogenous organic compounds that consist of large molecules composed of one or more long chains of amino acids and are an essential part of all living organisms. Proteins are substances that are part of cells, tissues and organs throughout the body. Protein can be found in both animal and plant foods. Plant and Animal products contains all 20 amino acids in varying amount. As far as the human body is concerned, there are two different types of amino acids: Essential and Non-essential. Non-essential amino acids are amino acids that the body can create out of other chemicals found in the body. Essential amino acids cannot be created, and therefore, the only way to get them is through food (Robert *et al*, 2000).The Sulphur –

containing amino acids: Methionine, Cystine and Cysteine are particularly important for the health of the brain and nervous system (Addo, 2005).

The importance of proteins in the diet of man cannot be overemphasized. This is because they play many important roles in the body system of animals including man which include the fact that they serve as the building block in the body structural organs, play vital roles in the maintenance of body structural integrity as well as function as hormones and enzymes (Fallon and Eing, 2001). Proteins encompass many important chemicals including immunoglobulin and enzymes. In short, they form the foundation of muscles, skin, bone, hair, heart, teeth, blood and brain and the billions of biochemical activities going on in our bodies every minute. When we fail to consume adequate amounts of protein, the blood and tissues can become either too acidic or too alkaline. Lack of dietary protein can retard growth in children and in adult, can be a contributing factor in chronic fatigue, gingivitis, angular stomatitis, and loss of strength, low productivity, low morale, lethargy, retardation, depression, slow wound healing and the decreased resistance to infections are common in this category of people (Iyangbe and Orewa,2009).

2.3 General Importance of Proteins

1. Proteins help to maintain and repair the old tissues in the body.
2. Protein in fluids such as blood helps to regulate body processes.

3. All the enzymes are protein and are essential catalysts in digestion and metabolic processes in the tissues.
4. Proteins form hormones that are responsible for regulating all activities of the body. Examples of hormones include Insulin, thyroxine, growth hormones, steroid hormones etc.
5. Proteins form antibodies and special white blood cells that defend the body against infections and diseases and thus participate in the body's immune system.
6. Proteins are ideal carriers of nutrients across cell membranes. Proteins as lipoproteins transport triglycerides, cholesterol, phospholipids and fat-soluble vitamins across the cell wall. Specific protein carriers ensure transport of many vitamins and minerals. Albumin carries free fatty acids, bilirubin as also many drugs.
7. Structures such as bone, skin and hair owe their physical properties to unique proteins. Collagen that appears as a densely packed long rod is the most abundant protein in mammals and it gives skin and bones their elastic strength. Hair and nails are made of Keratin which is another dense protein made of coiled helices.
8. Almost all amino acids have some unique functions in the body. Tryptophan serves as a precursor for the Vitamin-B niacin, Histidine is used in the

synthesis of histamine used as a vasodilator in the circulatory system, and Glutamic acid is a precursor of a neurotransmitter.

9. Protein in the blood helps to maintain appropriate fluid levels in the vascular system.
10. Proteins help maintain a stable p^H levels in the body fluids by serving as buffers, they pick up extra hydrogen ions when conditions are acidic, and they donate hydrogen ions when conditions are alkaline. If proteins are not available to buffer acidic or alkaline substances, the blood can become too acidic or too alkaline, resulting in either acidosis or alkalosis. Both conditions can be serious either can cause proteins to denature which can lead to coma or death (Insel *et al* 3rd Edition).

2.4 Protein Deficiency

Protein deficiency is common among people who live in developing countries, those who live in impoverished communities in developed countries and in the elderly who lack access to nutritious food. Protein deficiency also affects people who are born with a genetic disorder to produce certain proteins, and people with diseases that cause them to lose appetite and experience muscle breakdown.

2.4.1. Marasmus

Marasmus is a disease caused by a severe deficiency of protein and calories that affect infants and very young children. It occurs when a child is weaned earlier than normal

and receives foods low in nutrients. Children with marasmus appear bony, very underweight with no body fat, wasted muscles and muscle tissue and may suffer repeated infections, such as gastroenteritis, due to poor hygiene, often resulting in weight loss and dehydration (Elamin, 2016).

2.4.2 Kwashiorkor

Kwashiorkor is a disease caused by a severe deficiency of protein in diets that contain calories mostly from carbohydrates such as yams, rice and bananas. Kwashiorkor occurs when a child is weaned later than normal and receives starchy foods low in protein. It usually affects older children. People with kwashiorkor have low body weight, the face moon-shaped appear puffy in the abdomen area from retention of fluid (Elamin, 2016).

Common symptoms of both marasmus and kwashiorkor include fatigue, irritability, diarrhea, stunted growth and impairment of cognition and mental health (Elamin, 2016).

2.4.3. Deficiencies of Protein C and S

Deficiencies of protein C and protein S are inherited conditions that cause abnormal blood clotting. Deficiency of protein C occurs in about 1 out of 300 people. Deficiency of protein S affects 1 in 20,000 people. Symptoms for these deficiencies include redness, pain, tenderness or swelling in the affected area. People with these

protein deficiencies need to be careful about activities that increase risk of blood clots, such as prolonged sitting, bed rest, and long-time travel in cars and airplanes (Hooda *et al,*2009).

2.4.4. Cachexia

Cachexia is a condition that involves protein deficiency, depletion of skeletal muscle and an increased rate of protein degradation (Kotler, 2000). Cachexia causes weight loss and mortality and is associated with cancer, AIDS, chronic kidney failure, heart disease, chronic obstructive pulmonary disease and rheumatoid arthritis (Morley, 2006).

2.5. Sources of Protein

Protein can be found in all living things. The type and amount of protein within foods can vary, but inevitably it's there in some forms. The sources where protein can be found are classified into two major classifications:

- Plant Source and
- Animal Source

2.5.1. Animal Source

These foods got their origin from Animals. They include:

- Meat
- Fish

- Milk
- Eggs

2.5.2. Plant Source

Getting enough protein is possible without meat, dairy, eggs, poultry, fish, or anything else derived from an animal. Since animals get their protein from the earth, so can we. A variety of foods from the earth is full of amino acids that combine in the body to form proteins to keep one strong and healthy. These foods are so much better for the body than animal sources.

They include:

- Grains
- Vegetables and fruits
- Nuts and Seeds
- Green peas and
- Legumes

2.6. Importance of Plant Protein Sources

- They contain incredible amounts of nutrient-dense properties that the body and brain can use to help feel their best. Many of these foods are higher in protein per ounce than animal sources and include fiber, antioxidants, vitamins, and minerals.

- These foods support the body's muscular system and promote an alkaline environment, while animal-based foods promote inflammation and lead to an acidic body.
- It does not contain cholesterol that is harmful to the body like animal protein sources do.
- It helps to hold back on the amount of unhealthy fatty acids often found in animal protein food sources.
- Protects against Cancer With Legumes: Legumes, a plant food high in protein, contain multiple health-promoting substances, including saponins- Saponins, which are present in all legumes, such as pinto beans, black beans, kidney beans and peanuts, can help lower cholesterol levels, improve immune function and help protect against cancer. It also has a wide range of uses, including from reducing blood lipids to treat acute Lead poisoning. Saponins may also be able to reduce the risk of kidney stones.
- Plant Proteins helps to reduce insulin in the Body which contributes to Diabetes and High Blood Sugar (Hosseinpour-Niazi *et al,* 2014)

CHAPTER THREE

METHODOLOGY

3.1 Area of Study

This Study was conducted in Ekiti State (Ikole, Isan (Oye), Ijero and Ado Local Governments). Ekiti is a state in the western region of the Country and situated entirely within the tropics. Ekiti State is a landlocked state, having no coastal boundary with a total land Area of 5887.890sq km.

The State enjoys tropical climate with two distinct seasons. These are the Rainy season (April–October) and the Dry season (November–March). Temperature ranges between 21° and 28 °C with high humidity. Tropical forest exists in the south, while Savannah occupies the northern peripheries. The mean annual total rainfall in the south is about 1800mm while that of the northern part is hardly over 1600mm.

According to the 2006 census reports, the population of Ekiti state stood at 2,737,186 (NPC, 2006).The main occupation of the people includes: Farming, Trading, Civil Service, Pottery, Artisanship e.t.c. The main staple food of the people of Ekiti is Pounded yam with Isapa soup or vegetable soup. Food crops like yam, cassava, and grains like rice and maize are grown in large qualities. Other notable crops like kola nut and varieties of fruits are also cultivated in commercial quantities.

There are 16 Local Government Areas (LGAs) in Ekiti State. The apex of the administrative areas is the capital, Ado Ekiti. The state is divided into four Agricultural Zones by the Ekiti State Agricultural Development Project (EKADP) authority based on agro-ecological considerations.

3.2 Method of Data collection

Primary data on household food consumption and expenditure patterns was used in this study. The primary data were elicited using well-structured questionnaires from heads of household who consulted their household members on the households food budgetary planning and purchase.

Data were collected on the socio-economic characteristics of households such as, Age, Sex, Marital status, Primary Occupation, Secondary Occupation, Educational level of household heads, Household size, household income, number of household income earners.

Data were also collected on the household's protein consumption: the plant and animal source, and expenditure on protein: plant and animal sources consumed by the households in the last one month, expenditure on other food items consumed in the last one month, rates of consumption of protein, preferences of protein, reasons for plant protein preferences, reasons for animal protein preferences and factors affecting protein consumption were collected.

The secondary data were sourced from textbooks, journals, Magazines and other literature materials.

3.3 Sampling Technique and Sample Size

Given the four ADP zones of Ekiti State, a two-stage sampling procedure was adopted to select a representative sample for the study.

The first stage comprised the random selection of towns and villages in EKADP Zones A, B, C and D.

The second stage involved the random selection of 100 households across the selected towns and villages as shown in Table 2. The household heads or their representatives were interviewed via the use of questionnaires that were administered to them with a 7-days recall pattern.

TABLE 2 : SAMPLE DESIGN OUTLAY FOR STUDY

ADP ZONES	**TOWN/VILLAGE**	**NUMBER OF RESPONDENTS**
A	Ikole	25
B	Isan	25
C	Ijero	25
D	Ado	25
TOTAL	**4**	**100**

Source: Field Survey (2016)

3.4 Target Population

The target population for this study is those households that consume protein, whether the plant or the animal protein sources, in the study area.

3.5 Analysis of Objectives

Objectives	Meaning	Data required	Analytical tools
1) To describe the socio-economic characteristics of the protein-consuming households in the study area.	To provide basic information of the respondents who in this case are the protein-consuming households.	Age, Gender, Marital status, Educational level, Household size, Primary Occupation, Secondary Occupation, Income, and Number of Income earners of Households that consume Proteins.	Descriptive statistics such as frequency tables, mean and percentages.
2) To profile plant protein sources consumed by the Households.	To know the protein sources consumed by the Households.	Proteins consumed before, Plant protein consumed before, Animal Protein	Descriptive statistics such as frequency tables, mean and

		consumed.	percentages.
3) To determine how often households consume Plant protein sources.	To know if the Households consume enough Proteins in their diets or not and which of the Proteins they consume most.	Frequencies of consuming Beans, Green peas, Soybeans, Meat, Fish, Milk e.t.c. In a week.	Descriptive statistics such as frequency tables, mean and percentages.
4) To determine the level of households' expenditure on major plants and Animal protein sources.	To know how much the Households spend on Plant and Animal Protein sources in a month.	Expenditure on Animal Proteins in a month, Expenditure on Plant proteins in a month.	Descriptive statistics such as frequency tables, mean and percentages.

5) Determine variables that influenced plant protein preferences in relation to animal protein sources.	To know which of the protein sources preferred most by the Households and the variables that influenced such preference.	Protein preferred and reasons for preference.	Multinomial Logistic Regression

3.6 Analytical Techniques

To achieve the objectives of this study, the following analytical tools were employed in analyzing the data collected.

3.6.1 Descriptive Statistical Analysis

The descriptive statistical tools involved the use of tabular presentations, mean, frequency distribution and percentages which were used to analyze the socio-economic characteristics of households, Expenditure on Food (Plant Proteins, Animal Proteins, Carbohydrates and Soup Ingredients) ,Type of Protein Consumed by Household and their sources, Plant and Animal Protein preferences, their reasons and Frequency of Proteins consumption.

3.6.2 Multinomial Logit Model

The multinomial logit model that is based on the cumulative probability function was adopted because of its ability to deal with a polychotomous dependent variable and a well established theoretical background. Multinomial logistic regression, according to Roopa(2000) is a multivariate technique which allows for estimating the probability that an event will occur or not through prediction of dependent outcomes from a set of Independent variables.

The model was chosen based on survey results that revealed that household plant proteins preferences (Dependent variable) was found to be a categorical variable which can take three (3) categories or levels. These categories were assigned numbers 0, 1 and 2. 0 was used to indicate Animal protein only preference group; 1 for the plant only preference group and 2 was used to indicate combination of plant and animal protein preference group. The Plant protein preference group was taken as the reference group.

The multinomial logit model was therefore used to identify the variables that make households belong to categories 0 (Animal protein only) and 1 (plant protein only) instead of 2 (Plant and Animal protein) as follows:

The probability that the *ith* household belongs to the *jth* protein consumer group *Pij* reduces to:

Pij= _ebjXi

$$\text{SebjXi} \quad \text{----------(1}$$

k =j

Following Maddala (1990) and Babcock *et al.* (1995), the basic model is written as:

Pij= _ebjXi

$$\text{SebjXi} \quad \text{----------(2}$$

k =1

Where i= 1, 2,----- n variables; k= 0, 1, ---j groups and bj is vector of parameters that relates Xj_s to the probability of being in group j where there are $j+1$ groups.

For this study, the Xi variables range from X_1–X_8, where X_1= age, X_2 -Gender, X_3= Marital status, $X4$= Number of years spent in school, X_5 = consumption, X_6 – Household size, X_7 - Number of farming years, X_8 – Number of Household income earners

Normalization of the Model

As a rule, the summation of the probability for the three categorical groups in our model must equal to unity. This calls for normalization of the equation model. The common rule is to set one of the parameters - vectors equal to zero (Kimhi, 1994). Hence, for k number of choices only v–1 distinct parameters are identified and estimated.

Based on Equation (2), the probability of being in the reference group: plant protein preference group with parameter vectors equal 1 is

Pio= 1.

1+Sebj**Xi** ----------(3)

k =j

Similarly, the probability of being in each of the other *j* groups is

Pij= 2.

1+Sebj**Xi** ----------

----(4)

k =j

Dividing equation (3) by (4) gives

Pij = e**bjXi**

Pio ----------

----(5)

This denotes the relative probability of each group to the probability of the reference group. Hence, the estimated coefficients for each group reflect the effect of *Xi's* on the likelihood of the consumer's household belonging to that alternative group relative to the reference group. The logarithm of the odd ratio in the equation to base e gives the estimating equation.

ln **Pij** = bjXi ----------

----(6)

Pi0

Following Hill (1983), the coefficients of the group can be given using the formula

bv = - [b1 + b2 + ----- v-1] ----------

-----(7)

Issues: Coefficients, Their Signs and Interpretations

i. A positive coefficient indicates that the variable is associated with a higher probability of being in the group choice under consideration relative to the reference group. This implies that the probability of the individual selecting the particular group is greater than the probability of choosing the reference group.

ii. A negative coefficient means that the probability of the household choosing the particular group is smaller than the probability of being in the reference group.

iii. Estimates not significantly different from zero indicate that, the particular regressor (Xi) does not affect the consumption nor the probability of the state to which it applies relative to the reference group (Basant, 1997).

CHAPTER FOUR

RESULTS AND DISCUSSION

This Chapter deals with the presentation, interpretation and discussion of the data collected during the field survey.

4.1 Socio-economic Characteristics of the respondents.

The socio-economic characteristics of Households that consume protein is shown in table 4.1, which is expected to influence the consumption of proteins by the Households.

Table 4.1- Socio-economic characteristics of Respondents.

Characteristics	Frequency	Percentage
Age (years)		
20-30	23	23.0
31-40	24	24.0
41-50	26	26.0
51-60	24	24.0
61-70	3	3.0
Total	100	100.0
Mean Age	42years	

Characteristics	Frequency	Percentage
Age (years)		
20-30	23	23.0
31-40	24	24.0
41-50	26	26.0
51-60	24	24.0
61-70	3	3.0
Standard Deviation	11.9	
Sex		
Male	51	51.0
Female	49	49.0
Total	100	100.0
Marital status		
Single	17	17.0
Married	69	69.0
Divorced	1	1.0
Widowed	13	13.0
Total	100	100.0

Characteristics	Frequency	Percentage
Age (years)		
20-30	23	23.0
31-40	24	24.0
41-50	26	26.0
51-60	24	24.0
61-70	3	3.0
Educational Level		
None	8	8.0
Primary School(0-6 years)	10	10.0
Secondary school(7-12 years)	41	41.0
Tertiary school(13-17 years)	39	39.0
Others(17 years and above)	2	2.0
Total	100	100.0
Are you a Member of any Cooperative?		
Response		
No	67	67.0

Yes	33	33.0
Cooperatives of Respondents		
None	67	67.0
Farmers' cooperatives	13	13.0
Multipurpose cooperatives	9	9.0
Credit and Thrift cooperatives	11	11.0
Total	100	100.0
Household Size		
1-5	47	47.0
6-10	53	53.0
Mean size	6	
Total	100	100
Primary Occupation		
Trading	35	35.0
Civil Service	33	33.0

Artisanship	4	4.0
Farming	24	24.0
Others	4	4.0
Total	100	100.0
Secondary Occupation		
None	52	52.0
Trading	9	9.0
Artisanship	3	3.0
Farming	28	28.0
Others	8	8.0
Total	100	100.0
Estimated Monthly Income (₦)		
Low income earners	10	10.0
High income earners	90	90.0
Mean Income (₦)	55265	
Total	100	100.0
Number of Household Income earners		

1	19	19.0
2	48	48.0
3	21	21.0
4	12	12.0
Total	100	100.0

Source: Field Survey, 2016

The result of the study as shown in Table 4.1 showed that most (26%) of the Respondents were aged 41-50years, 23% were between the ages of 20-30 years, 24% were between 31-40 years,24% were within the range of 51-60, 3% were aged between 61-70 and the mean age was 42years which implies that majority of the respondents are within the actively working population and they are old enough to decide what to consume. This is in line with the findings of Adetunji and Adepoju in their study titled "Evaluation of Households' protein consumption pattern in Orire Local Government Area of Oyo State" which showed that majority of the respondents were less than 50years of age.

Table 4.1 revealed that majority 51% of the Respondents were males and 49% were females. This affects consumption of protein because males need more proteins than female for body building. This is in line with Olasunkanmi in his work titled

"Consumption analysis of proteinous food in Remo division of Ogun state" showing that majority were males.

As shown in Table 4.1,17% of the Households' heads were single, 1% was Divorced, 13% were widowed and the majority (69%) of the Respondents were married, the findings showed that the tendency to consume more protein is high due to an expansion in the family size and there is greater responsibility in terms of expenditure on food items. This is in line with the study of Olaniyi in his work titled "Attitudinal disposition of urban dwellers towards participation in Urban Agriculture in Oyo State, Nigeria; Implication for Sustainable food production" which also showed that majority were married.

Table 4.1 also showed that majority 41% of the Respondents spent 7-12 years in school and the mean number of years spent in school is 12 years. Education changes taste over time and usually affects consumption pattern, preference for food items, and nutrition of a household as the household head become aware of the nutritional value of protein foods. This corroborated with the work of Olaniyi in his work titled "Attitudinal disposition of urban dwellers towards participation in Urban Agriculture in Oyo State, Nigeria; Implication for Sustainable food production" where majority 59.5% spent 12 years and above.

According to table 4.1, 67% of the Respondents do not belong to any Cooperative or Farming Organizations while the remaining 33% belong to Cooperatives such as

Farmers' cooperatives, Multi-purpose cooperatives, Credit and Thrift cooperatives. This affects consumption because it determines whether the households' heads have outside financial assistance for their households or not.

In this study, table 4.1 showed that 47% of the households' head had 1-5 members in their household, the majority 53% had 6-10 members in their households and the average household size was 6. Household size has a significant effect on the Consumption pattern of food items by Households because as the family size increases, there is tendency of the household to consume more food and the percentage of the income going to each member of the household decreases. This is in line with Adetunji and Adepoju in "Evaluation of Households' protein consumption pattern in Orire Local Government Area of Oyo State" where majority 38.8% had 6 members and also Fakayode *et al,* 2010 in his own findings "Economic Analysis of Rice Consumption Patterns in Nigeria" too where the average household size was 6 members.

According to Table 4.1, a sizable number (35%) of the respondents engaged in Trading as their primary occupation, 33% engage in civil service, 4% were artisans, 24% engaged in Farming and the crops planted includes Maize, Vegetables, Yam e.t.c and 4% are into other occupation. Occupation is a primary determinant of the consumers' income and income on the other hand determines the households' level of consumption as Consumption is hypothesized to be a function of disposable income.

This is in line with the findings of Olorunfemi Ogundele in "Factors influencing consumers' preference for Local rice in Nigeria" where majority of the respondents were traders. However, some (42%) supplemented their primary occupation with farming, artisanship and civil service which implies that they have other sources of income to finance their households. Table 1 showed that Majority 90% of the respondents belong to the High Income group leaving the remaining 10% as Low income earners and the mean income of the respondents is ₦55265. Majority 48% of the respondents had two income earners, 21% had three income earners, 19% had only one income earner and 12% had 4 income earners in their households. Income affects consumption as Consumption is hypothesized to be a function of disposable income.

Table 4.2– Proteins consumed by Households

Proteins	Frequency	Percentage
Plants and Animal Protein	100	100
Total	100	100.0
Animal Proteins		
All of the Above (Meat, Milk, Fish, Egg)	100	97.0
Total	100	100.0
Plant proteins		
Cowpea	100	100
Amaranthus	98	98
Soybean	50	50
Greenpea	40	40
Oat	36	36
Locust Beans	100	100
Total	100	100
Source of Plant Proteins		
Market	100	100
Own Farm	44	44

Gift	17	17
Total	100	100

Source: Field Survey, 2016.

One of the objectives of this study is to profile plant protein sources consumed by Households in the Study Area. According to the result of this study as shown in Table 4.2 revealed that all the Households (100%) have consumed both Plant and Animal Protein foods before. The most commonly consumed Animal Protein food is Meat, Milk, Egg and Fish which has been consumed by all (100%) the Households' before. The most commonly consumed Plant protein food is Beans and Locust Beans which has been consumed by all(100%) the Households before, 98% has consumed Amaranths before,other sources such as Soybean has been consumed by 50% of the households, 40% has consumed Green pea before, 36% has consumed Oat before.

All (100%) the households claimed they have access to Plant Protein foods from the market, 44% of the respondents claimed they sourced their Plant protein foods from their farms and 17% of the respondents got Plant protein foods as gift. This is in line with Adetunji and Adepoju in "Evaluation of Households' protein consumption pattern in Orire Local Government Area of Oyo State" where majority 51% of the respondents sourced their protein foods from the Market.

Table 4.3 – CONSUMPTION PATTERN OF PROTEINS BY HOUSEHOLDS IN A WEEK

Cowpea	**Frequency**	**Percentage**
Once	5	5.0
Twice	35	35.0
Thrice	42	42.0
Four times	16	16.0
Five times	2	2.0
Total	100	100.0
Amaranths		
Once	1	1.0
Twice	28	28.0
Thrice	47	47.0
Four times	22	22.0

Five times	2	2.0
Total	100	100.0
Soybean		
None	74	74.0
Once	4	4.0
Twice	12	12.0
Thrice	9	9.0
Four times	1	1.0
Total	100	100.0
Green pea		
None	72	72.0
Once	17	17.0
Twice	10	10.0

Thrice	1	1.0
Total	100	100.0
Oat		
None	73	73.0
Once	1	1.0
Twice	7	7.0
Thrice	9	9.0
Four times	7	7.0
Five times	2	2.0
Six times	1	1.0
Total	100	100.0
Locust Beans		
None	1	1.0

Once	5	5.0
Thrice	13	13.0
Four times	25	25.0
Five times	31	31.0
Six times	10	10.0
Seven times	15	15.0
Total	100	100.0
Meat		
None	2	2.0
Once	3	3.0
Thrice	14	14.0
Four times	24	24.0
Five times	21	21.0

Six times	7	7.0
Seven times	29	29.0
Total	100	100.0
Fish		
Twice	2	2.0
Thrice	9	9.0
Four times	12	12.0
Five times	4	4.0
Six times	7	7.0
Seven times	66	66.0
Total	100	100.0
Milk		
None	14	14.0

Once	6	6.0
Twice	28	28.0
Thrice	27	27.0
Four times	13	13.0
Five times	4	4.0
Seven times	8	8.0
Total	100	100.0
Egg		
None	13	13.0
Once	13	13.0
Twice	44	44.0
Thrice	18	18.0
Four times	7	7.0

Five times	2	2.0
Seven times	3	3.0
Total	100	100.0

Source: Field Survey, 2016.

One of the objectives of this study is to determine how often plant protein sources in relation to Animal protein sources are consumed among households in the study area. According to the results of this study, table 4.3 revealed that majority (42%) of the respondents consumed Beans three times in a week, majority (47%) consumed Amaranths three times in a week. Few people (12%) consumed Soybean in a week, the highest percentage of respondents (17%) consumed green pea once in a week, and just 9% of the respondents ate Oat three times in a week. Majority (31%) of the respondents consumed Locust beans five times in a week. In the last one week, none of the households consumed Lentils. As shown in Table 4.3, majority (29%) of the households consumed meat everyday of the week (seven times), 66% of the households consumed fish everyday of the week (seven times), majority (28%) of the households consumed milk twice in a week, while 44% of the households consumed egg twice in a week.

Table 4.4 – Expenditure on Foods.

Expenditure on Food	Frequency	Percentage
Expenditure on Animal Protein(₦)		
0 – 5000	27	27.0
5001 – 10000	50	50.0
10001 – 15000	19	19.0
15001 – 20000	4	4.0
Total	100	100.0
Mean Expenditure (₦)	**7649.50**	
Expenditure on Plant Protein (₦)		
0-5000	85	85.0
5001-10000	15	15.0
Total	100	100.0
Mean Expenditure (₦)	**3667.00**	
Expenditure on Carbohydrates(₦)		
0 – 5000	26	26.0
5001 – 10000	59	59.0
10001 – 15000	14	14.0

15001 – 20000	1	1.0
Total	100	100.0
Mean Expenditure(₦)	**7249.50**	
Expenditure on Soup Ingredients(₦)		
0-1000	17	17.0
1001 – 2000	61	61.0
2001 – 3000	19	19.0
3001 – 4000	3	3.0
Total	100	100.0
Mean Expenditure (₦)	**1785.00**	

Source: Field Survey, 2016.

The result of this study as shown in Table 4.4 shows that Majority 50% of the respondents spent between **₦5,001 - ₦10,000** on Animal protein food monthly followed by 27% who spent **₦0 - ₦5000** monthly, 19% spent **₦10,001 - ₦15,000** monthly and the remaining 4% spent **₦15,001 - ₦20,000** monthly. The mean expenditure on Animal protein foods is **₦7649.50** monthly. Table 4.4 also showed that majority 85% spent **₦0- ₦5,000** on Plant protein foods monthly and the remaining 15% spent **₦5,001 - ₦10,000** monthly. The mean expenditure on Plant Protein foods is **₦3667.00** monthly. This is line with Bamiro in his study "Consumption analysis of

proteinous food in Remo division of Ogun State, Nigeria" which showed that the mean expenditure on Animal protein foods is higher than that of Plant protein foods. Table 4.4 further showed that majority 59% of the respondents spent **₦5,001 - ₦10,000** on Carbohydrates monthly while 26% spent **₦0 - ₦5,000** monthly, 14% spent **₦0 - ₦5,000** monthly , and the remaining 1% spent **₦15,001 - ₦20,000** monthly. The mean expenditure on Carbohydrates is **₦7249.50.** Majority 61% spent **₦1,001 - ₦2,000** on soup ingredients monthly, 17% spent **₦0 – ₦1,000** monthly, 19% spent **₦2,001 - ₦3,000** monthly while the remaining 3% spent **₦3,001 - ₦4,000** monthly. The mean expenditure on Soup Ingredients was **₦1785.00**.

4.5 Variables that influenced Plant Proteins Preferences to Animal Protein Preferences

TABLE 4.5 – Multinomial Logistic Estimates

Consumers of Plants and Animal Sources		Consumers of Animal Sources only
Variables	**Parameter**	**Parameter**
Age	1.57(0.00)*	0.03(0.976)
Gender	0.00(1.00)	-1.83(0.067)**
Years spent in school	1.459(0.012)*	-2.20(0.028)*
Household size	11.08(0.00)*	0.64(0.524)
Number of income earners	5.081(0.081)*	1.73(0.083)**
Constant	-0.00(0.998)	0.665(-1.107)
Log likelihood	-29.465	
Likelihood	0.6917	
Chi-square	132.19	
Number of observation	100	

Source: Output of Computer analysis

Note: Figures in brackets are the t-value of the estimated regression coefficients. *implies significant at 5 percent level of significance. ** implies significant at 10 percent level of significance.

The variables that determine the various protein consumer categories were analyzed using the multinomial logit model. The result of the model estimation is presented in Table 4.5

From the study, the likelihood ratio test for the model lambda (λ) is -29.465which is significant at 5 percent. This implies that the protein consumer groups are heterogeneous. The multinomial logistic estimate for the combined protein consumer group (consumers of plants and animal protein groups) indicates that age, years spent in school, household size and numbers of income earners were significant. These variables therefore determine why households prefer to consume a combination of plants and animal protein sources. Gender is not significant and therefore it did not significantly influence a household's preference for a combination of plants and animal protein sources to the animal protein sources only. Also, the multinomial logistic estimate for the animal protein sources only group indicates that Gender, Years spent in school and Number of income earners. These variables therefore determine why households prefer to consume animal protein sources alone to the plant protein sources. Age of Households'heads was not significant. The variable therefore did not significantly influence a household's preference for animal protein sources only. Age, Years spent in school by the households'head, number of income earners in the household and household size variable coefficient was positive, implying that the probability of the household

consuming either a combination of plants and animal protein sources or the animal protein only relative to the plant protein sources only increases as the age, Years spent in school by the households'head, number of income earners in the household and the household size increases.

The number of income earners in the household was positive implying that the variable explains why the household would forgo plant protein sources for animal protein sources only. The probability of consuming animal protein sources relative to the plant protein sources increases as the number of income earners in the household increases.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS.

5.1 SUMMARY

This research was undertaken to determine consumption preference between plant protein and animal protein sources by households in Nigeria, using Ekiti state as a case study and the variables that influenced the households' consumption preference between the two. The study methodology comprised a two stage sampling technique which was used to survey 100 protein consumer households across localities within the Ekiti State Agricultural Development Project Zones. Analytical tools used in the study include descriptive statistics and the multinomial logit model. The study revealed that the mean age of the households' heads was 42years, most (51%) of the households' heads are males, of which about 69% are married. Many (41%) of the household's heads (35%) were had secondary education with mean household size of 6. Majority of the households' heads were Traders and mean monthly income of N55, 265.00. Beans, vegetables and locust beans are the plant protein sources consumed most by Households and the *per capita* expenditures on the two classes of protein source of foods indicate that the mean per capita expenditure (**₦7649.50**) on animal protein source food (APSF) is greater than the per capita expenditures (**₦3667.00**) on plant protein source food (PPSF). The major factors that significantly influenced household

preferences for either a combination of plant and animal protein sources or the plant proteins only to the animal proteins were age, sex, the educational status of the household head, household size and number of income earners in the household were the variables that influenced preference for the combination of plant and animal protein sources, gender, educational status, and number of income earners in the household were the variables that influenced preference for animal protein sources only. This study therefore recommends that rural household dwellers should be encouraged to produce plant protein sources in order to increase their personal consumption and distribution to the urban areas.

5.2 CONCLUSION

This study examined the nature and patterns of plant proteins consumption in Nigeria, using Ekiti State as a case study. The study result shows that a majority of households were 42years on the average, Traders, with an average household size of 6. Beans, vegetables , Soybeans and locust beans are the plant protein sources consumed most by Households, the households consumed beans and vegetables three times in a week, just few consumed soybeans, greenpea and oat twice, once and thrice respectively in a week, and they also consumed locust beans five times in a week, despite the importance of plant protein sources in the diet , expenditure on plant protein sources was low compared to animal protein sources among the Households.

Based on the types of proteins consumed by household, households can be classified into three groups: households that consumed plant protein only, those that consume animal protein sources only and those that consumed a combination of the plants and animal protein sources. Unavailability of plant protein sources, Constipation due to consumption of Plant protein sources was revealed as a deterrent to its consumption by households. These groups constitute 21 percent, 58 percent and 21 percent of the total household respondents in the study area, respectively.
The multinomial logit model revealed that Age, the educational status of the head of household, household size and number of income earners in the household were the variables that influenced preference for the combination of plant and animal protein sources. Gender, educational status, and number of income earners in the household were the variables that influenced preference for animal proteins

5.3 RECOMMENDATIONS

The study therefore recommends that:

- rural household dwellers should be encouraged by providing credit facilities through banks, other financial institutions and the procedure should be made simple to produce plant protein sources in order to increase their personal consumption and distribution to the urban areas.

- public enlightenment campaigns should be embarked upon to enlighten people on the consequences of protein-energy deficiencies so as to enhance consumption of protein products and reduce the rate of malnutrition in the study area and the nation at large.
- the importance of plant protein sources in the diets should be properly communicated to the public both in urban and rural areas. This will help to increase the rate of consumption as well as the expenditure on these protein sources.
- there should be reduction on income taxations which will increase the disposable income, enhance household's consumption and expenditure on major proteins as well as other food sources also the household heads should be encouraged to spend more on plant protein sources than its animal protein counterpart.

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APPENDIX

QUESTIONNAIRE

FEDERAL UNIVERSITY OYE-EKITI, EKITI STATE

TITLE: HOUSEHOLD CONSUMPTION PREFERENCE FOR PLANT PROTEINS IN EKITI STATE

Dear Respondents,

This questionnaire is strictly for academic purpose and it is designed to collect relevant information on the above topic. Kindly supply information required as accurately as possible and as such will be treated confidentially.

Instruction: Kindly fill-in the gaps and/or tick as appropriate.

SECTION A- SOCIO-ECONOMIC CHARACTERISTICS OF THE RESPONDENTS

1. Age in years? _____
2. Gender (a.) Male ( ) (b) Female ( )
3. Marital status (a) Single ( ) (b) Married ( ) (c) Divorced ( ) d. Widowed ( )
4. Highest level of Education Attained?a. No formal Education ( ) b. Primary ( )

c.Secondary ( ) d. Tertiary ( ) e. Others

specify_____

5. Are you the Household head? Yes ( ) No( )
6. Are you a member of any cooperative or farming organization? Yes ( ) No ( )
7. If yes please specify:_____
8. Household size _____
9. Primary Occupation of the Household head? a. Trading ( ) b. Civil Service ( ) c. Artisan ( ) d. Farming ( )
10. If farming, how long have you been farming? _____
11. Which crop(s) do you plant? a. Maize ( )b. Cowpea ( )c. Vegetables ( ) d. Yam ( ) e. Others specify _____
12. Secondary Occupation of the Household Head? _____
13. What is your estimated average monthly income_____N
14. What is your average monthly savings _____N
15. What is your average monthly investment_____N

b. Number of Household Income earners _____

16. SECTION B – HOUSEHOLD EXPENDITURE ON FOOD

I. HOUSEHOLD EXPENDITURE ON ANIMAL PROTEIN SOURCES

Food Items	**Expenditure/Month(₦)**	**Mean Expenditure (₦)**	**Percentage (%)**
Meat			
Fish			
Milk			
Egg			
Others specify			

II. HOUSEHOLD EXPENDITURE ON PLANT PROTEIN SOURCES

Food Item	**Expenditure/Month(₦)**	**Mean Expenditure (₦)**	**Percentage (%)**
Cowpea			
Amaranths			
Soybean			
Green pea			

Oat			
Locust beans			
Others specify			

III. HOUSEHOLD EXPENDITURE ON DIFFERENT FOOD TYPES

Description	**Expenditure/Month(₦)**	**Mean Expenditure/ Month(₦)**	**Percentage (%)**
Animal Protein			
Plant Protein			
Carbohydrates			
SoupIngre.			

SECTION C – RATE OF CONSUMPTION PER WEEK

17. Which of the following have you consumed before? a. Plant Proteins only ( )
b. Plant Proteins and Animal Proteins ( ) c. Animal Proteins only ( ) d. None of the following ( )

18. Which of the following Animals protein sources have you consumed before? a. Meat ( ) b. Milk ( ) c. Fish ( ) d. Egg ( ) e. All of the above ( ) f. None of the above ( ) g. Others specify_____

19. Which of the following Plant protein sources have you consumed before? a. Cowpea ( ) b. Amaranths ( ) c. Soybean ( ) d. Green pea ( ) e. Oat ( ) f. Locust bean ( ) g. Lentils ( ) h. Pigeon pea ( ) i. All of the above ( ) j. None of the above ( ) k. Others specify_____

20. How did you get the Plant Protein Foods? a. Purchase from market ( ) b. From own farm ( ) c. As gift ( ) d. Others Specify _____

21. Kindly provide information on the Frequency of consumption of Plant Proteins viz-a-viz Animal Proteins

Food Items	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**	**Sunday**
Cowpea							
Amaranths							
Soybean							
Green pea							
Oat							
Locust bean							
Lentils							

Meat							
Fish							
Milk							
Egg							
Others specify							

SECTION D – PLANT PROTEIN CONSUMPTION PREFERNCE VIZ-A-VIZ ANIMAL PROTEIN CONSUMPTION

22. Do you prefer Plant Protein Sources to Animal Protein Sources?

i. Yes ( ) iii. Both ( )

ii. No ( )

23. Reasons for Plant Protein Consumption Preferences

i. Price Affordability ( )

ii. Nutritional Content ( )

iii. Taste ( )

iv. Easy Digestion ( )

v. Low Cholesterol content ( )

vi. Protein content ( )

vii. Others

specify_____

24. Reasons for Animal Protein Consumption Preferences

i. Price Affordability ( )

ii. Nutritional Content ( )

iii. Taste ( )

iv. Easy Digestion ( )

v. High Cholesterol content ( )

vi. Others

specify_____

25. What benefit do you get from the consumption of Plant Proteins? a. Balanced diet ( ) b. Growth ( ) c. To quench hunger ( ) d. Others specify_____

SECTION F – FACTORS AFFECTING PLANT PROTEIN CONSUMPTION VIZ-A-VIZ ANIMAL PROTEIN CONSUMPTION

26. What factors affects your Plant Protein Consumption?

a. _____

b. _____

c. _____

d. _____

27. Suggest possible solutions to these Constraints of Plant Protein Consumption

a. _____

b. _____