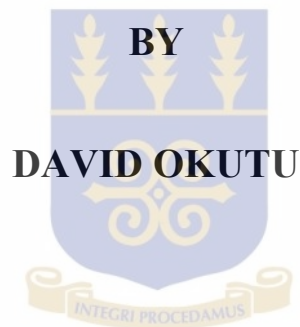


**UNIVERSITY OF GHANA,  
REGIONAL INSTITUTE FOR POPULATION STUDIES**

**URBAN HOUSEHOLD CHARACTERISTICS AND  
IMPLICATIONS FOR FOOD UTILIZATION IN  
ACCRA**



**THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF  
GHANA, LEGON IN PARTIAL FULFILMENT OF THE  
REQUIREMENT FOR THE AWARD OF MPhil POPULATION  
STUDIES DEGREE.**

**JULY, 2012**

## ACCEPTANCE

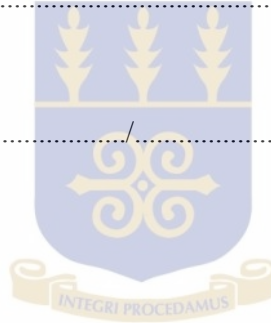
The thesis attached hereto, entitled “Urban household characteristics and implications for food utilization in Accra” prepared and submitted by David Okutu to the Faculty of Social Studies, University of Ghana, Legon in partial fulfillment of the requirements for the degree of M.PHIL. (Population Studies).

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## DECLARATION

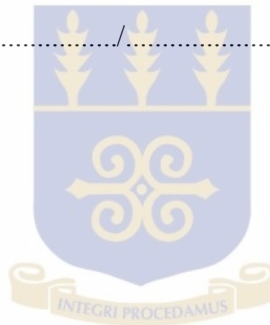
I hereby declare that this thesis is a product of my own research work and all other sources are duly acknowledged. This work has not been submitted for any academic degree to any university. My principle supervisor has been Prof S.N.A Codjoe at the Regional Institute of Population Studies, University of Ghana.

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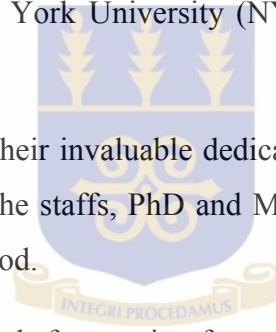
This work was supported by IDRC-AARC (RIPS) and EDULINK. Thanks to the almighty God. I would never have made it on my own. Special thanks to the IDRC-AARC project (RIPS) for giving me this amazing opportunity through a fellowship. Thank you so much Professor F.N.A Doodoo (Director RIPS), for EVERYTHING, I appreciate you a lot. I wish to particularly acknowledge Professor S.N.A CODJOE and Professor G.OWUSU for their immense supervision, fatherly encouragement and taking hours off their busy schedule to ensure that this work was done well. I would significantly recognize the contribution of Dr D.B Dovie for his intellectual guidance and input in this work.

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Special thanks to the family of Mrs. Susan Obal, Rev Dr Alfred Banya and to my family for supporting, encouraging and loving me.



## DEDICATION

I dedicate this work to my family, the late Mrs Toopaco Margaret Okuttu. I love you mum.

Tony, Jennifer, Bitek, Flavia and Gladys-Peace. God bless you abundantly.



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## ABBREVIATIONS AND ACRONYMS

**AARC**- African Adaptation Research Centre  
**ANOVA**-Analysis of Variance  
**APHRC**-African Population and Health Research Centre  
**BMI**-Body Mass Index  
**CIWQ**-Consumer Index and Wealth Quintile  
**DD(s)**- Dietary Diversity Score  
**DES**- Diet Energy Supply  
**FANTA**- Food And Nutrition Technical Assistance  
**FAO**- Food and Agriculture Organization of the United Nations  
**FAOSTA**-Food and Agriculture Organization Statistics  
**FCS**- Food Consumption Score  
**GAMA**- Greater Accra Metropolitan Assembly  
**GAR**-Greater Accra Region  
**GDHS**-Ghana Demographic and Health Survey  
**GEC**- Global Environmental Change  
**GLSS**- Ghana Living Standard Surveys  
**GPHRCF**- Global Public Health Research Challenge Fund  
**GSGDA**-Ghana Shared Growth and Development Agenda  
**GSS**- Ghana Statistical Services  
**HDD (s)**-Household Dietary Diversity Score  
**HFIS**-Household Food Insecurity Scale  
**HHH**-Household heads  
**HSRC**-Human Sciences Research Council  
**IDRC**-International Development Research Centre  
**IFPR**-International Food Policy Research Institute  
**IRB**- Institutional Review Board  
**NMIMR**-Noguchi Memorial Institute for Medical Research  
**POPTRCD**-Population Training and Research Capacity for Development  
**RIPS**- Regional Institute for Population Studies  
**WHSa**- Women Health Study of Accra  
**WHO**-World Health Organization  
**WFP**-World Food Programme

## ABSTRACT

The right to food is one of the most consistently mentioned international human rights to date. Unfortunately it is also one of the most spectacularly violated in recent times. Little attention has been given to food security particularly among the urban poor. This study seeks to examine the relationship between the household demographic and socio-economic characteristics of urban low-income population and its implication for food utilization with an emphasis on dietary diversity.

The study uses data from the second round of the EDULINK/AARC/GPHRCF survey, 2011. Data was collected from a sample of 452 households, on the pattern of consumption of drinks and varieties of food items across different food groups, frequency of consumption (number of times) and the sources of foods (home, or outside the home including street vendor, fast food joints, chop bar and restaurants) consumed in the last seven days preceding the survey. Nine different standardized food groups were scored to generate the household dietary diversity score ranging between 0 and 9. The household dietary diversity score was used as a proxy measure of food security. A linear regression analysis was used to determine the statistical association between household demographic and socio-economic characteristics and household dietary diversity, controlling for confounding factors such as cultural factors (food taboos) and social support networks, and food access.

Key findings revealed that male-head of households consumed more food varieties than female-heads. Household heads both female and male consumed more food varieties outside the home than at home. With regards to frequency, higher number was consumed at home than outside the home by both sexes of household heads. Sex of household heads, educational level of household heads, household wealth status and source of food eaten were significant predictors of dietary diversity. There was low consumption of fruits and milk/dairy products while the most commonly eaten food group was cereal based staples, meat/fish/eggs, snacks/processed foods and vegetables usually prepared in the form of stews/soups or sauces as accompaniments to the cereals. Households whose heads had no education, those in the poorest quintiles, female-headed households, households with six or more members and households whose heads were not working as at the time of the survey were the most disadvantaged in terms of dietary diversity. Also, educational status, household wealth status, sex of household heads and sources of food

(Home and Outside home) were the only statistically significant predictor variables of HDD at  $p < 0.05$ .

Food-based approaches have been recommended as the first priority to meet micronutrient needs and address the new emerging issues of obesity and other chronic non-communicable diseases relating to poor dieting and limited physical activities in such an urban environment with sedentary occupations and lifestyle. Information collected on dietary diversity can be used to inform a baseline assessment of food security at the individual, household, national and global levels.

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background of the study

The concept of food security has long evolved since the World Food Summit of 1974 (Maxwell and Smith, 1992) and has noted a shift from global and national to households and individuals, and from food availability to food accessibility (Sen, 1981; FAO, 2011). The right to food remains one of the most consistently mentioned international human rights to date, unfortunately it is also one of the most spectacularly violated in recent times (Clover, 2003). At the 2002 World Food Summit, the chair person stated that “together with terrorism hunger is one of the greatest problems the international community is facing” (Clover, 2003). This statement illustrates the fluidity of the international security environment since the end of the Cold War where climate change, human security and food security have become new areas of concern, with respect to vulnerability and risk.

Food security exists when “*all people, at all times, have physical or economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life*” (FAO, 1996). The three fundamental components of food security; availability, access and utilization and the fourth being food stability as added by Clover (2003) quite differ in urban compared to the rural norm of viewing food insecurity and also vary across socio-economic groups. Food security is a principal outcome of the food system.

The food system refers to the dynamic interactions between and within biogeophysical and human environments which stretches the food system activities (*production, processing/storage, distribution/retailing and consumption*) leading to the food system outcomes; food access (*affordability, allocation and preference*), food availability (*production, distribution and exchange*) and food utilization (*nutritional value, social value and food safety*) as defined by Gregory et al. (2005). Food systems are therefore, a much broader consideration than just productivity and production alone (Ericksen, 2007; Ingram and Brklacich, 2002). Nutritional adequacy and diet variety are important elements of food utilization (FAO, 2011; 2008; WFP, 2009). According to Kennedy et al. (2010) and Hoddinott and Yohannes (2002), dietary diversity is an important outcome measure of food security at the individual or household level. Dietary diversity relates to adequate nutrients (coverage of basic needs in terms of macro and micro nutrients) and to diet variety or balance,

which is thought to reflect adequate intake of essential nutrients (Kennedy et al. 2010; FAO, 2007; FAO, 2004).

Dietary diversity is a reflection of both food availability and food access; on the premise that the household consumes a variety of food groups when they have the means to acquire them (FAO, 2011; Kennedy et al. 2010; Swindale and Bilinsky, 2006). Over the past decades there have been three large multi-country validation studies and many micro studies which have examined associations between dietary diversity and food security or micro-nutrient adequacy which have potentials for monitoring changes in dietary energy availability (Hoddinott and Yohannes, 2002). The most recent of this was the dietary diversity among women of reproductive age in five countries (Arimond et al. 2010).

With context to an urban setting, Pothukuchi and Kaufman (1999) clearly demonstrate the importance of placing the food system on the urban agenda. In the 1970s and 1980s, solutions proposed to address food insecurity were purely technological, and focused on increasing availability rather than considering the broader context of food security (Clover, 2003). Consequently, most development priorities including food insecurity are targeting the rural populace on the perception that food insecurity, malnutrition and poverty are rural phenomena, paying minimal attention to the growing numbers of the urban poor (Nakabo-Ssewanyana, 2003).

The Food and Agriculture Organization (FAO, 2008) stresses that “food system” and “food security” fundamentally depends more on the socio-economic conditions than on the agro-climatic related issues and on access to food rather than the production or physical availability of food”. More food production may not necessarily be an appropriate strategy to combat food crisis (Codjoe, 2007). Food availability, access and utilization are all complex issues that encompass a wide range of interrelated economic, social and political factors – internal and external – which challenge the vulnerable households, communities, states and regions of the world. This therefore, makes it imperative to examine household characteristics such as urban housing structures, livelihood assets and household size (Anarfi and Ahiadeke, 2006), sex of household heads (Codjoe and Owusu, 2011; Maxwell et al.2000 and Levin et al. 1999), household expenditure on food (Smith and Haddad, 2002), ethnic group of household heads (Codjoe and Owusu, 2011; de-Graft Aikins, 2011 and Badasu, 2004) and locality or community of residence (Anarfi and Ahiadeke, 2006; Morrison et al. 2002; Maxwell et al.

2000) among others, since these factors may influence households livelihood capability (Sen, 1981) and thus access to and utilization of food.

Urban lifestyle is quite busy so that most foods available are prepared outside the home; including street vendors, foods served in restaurants and kiosks or chop bars which has implications for dietary pattern and further compounds dietary inadequacy. Access to urban foods depend largely on cash exchange with a few exceptions where some urban households engage in small farming in the back yards for household intake which is not the case for shanty towns (Kennedy, 2003; Maxwell et al. 2000). For instance, urban residents in Mozambique purchase 83.0 percent of the food they consume (Garrett and Ruel, 1999) compared to what Maxwell et al. (2000) found that in Accra on average families spent 54.0 percent of their income on food and 60.0 percent of these are in the lowest income bracket. By and large, even though there may be a wide variety of foods in the urban markets, it is not necessarily of diverse superior nutritional value and socially accepted foods (Hoddinott and Yohannes, 2002).

Logically, all these make one ask whether this non-agricultural, overcrowded, low income populace whose livelihood is largely dependent on cash exchange may survive the adverse impact of food insecurity. Codjoe and Owusu (2011) and Clover (2003) attest to the fact that our understanding of food security would be grossly inadequate if focus is on increased food productivity alone without holistically examining the other food security components. It could possibly foster ineffective policy measures and adaptation to such adverse outcome of food insecurity. This therefore, calls for a more comprehensive approach to view the food systems outcome which if further stressed by the Global Environmental Change (GEC), cultural and socio-economic drivers may disrupt the food system leading to food insecurity (Codjoe and Owusu, 2011; Codjoe, 2007; Ericksen, 2007; Gregory et al. 2005; Kennedy, 2003; Ingram and Brklacich, 2002; Maxwell et al. 2000; Pothukuchi and Kaufman, 1999). It is on this basis that this study focuses on how urban household characteristics may influence other components of the food system outcome such as food utilization with emphasis on dietary diversity as a proxy measure to food security (Hoddinott and Yohannes, 2002; Food and Nutrition Technical Assistants (FANTA), 2002 and Ruel, 2002).

## 1.2 Statement of the problem

Millions of people worldwide suffer from hunger and under-nutrition majority of who are women and children who are most vulnerable to the scorch of malnutrition (FAO, 2011). This is particularly attributed to food insecurity which is an international problem (FAO, 2008). This continues to be a challenge not only to developing countries, but also for the developed world. The difference lies in the magnitude of the problem in terms of its severity and the proportion of the population affected (Codjoe and Owusu, 2011; Ericksen, 2007; Gregory et al. 2005; Kennedy, 2003; Clover, 2003; Ingram and Brklacich, 2002).

The rate at which urban poverty is increasing, further compounded by the rising urban sprawl, slum growth and the additive effect of population growth rate, is an indication that over time, food insecurity and malnutrition and its health related consequences are going to be critical problems in urban areas (Pothukuchi and Kaufman, 1999). According to the Ghana Statistical Service (GSS) (2003) poor nutrition is one of the underlying causes of infant mortality. The figures of the Greater Accra Region (GAR) for stunted (14.4 percent), wasted (22.8 percent) and underweight (29.6 percent) children were relatively higher than the national average. Maxwell et al. (2000) found that in Accra, 26.5 percent of children in urban poor households were under-weight relative to 21.3 percent for the rural poor. Conversely, children of migrant households are worse off in terms of wasting and under-weight than for non-migrants. This calls for an understanding of urban food security and examination of the ways by which residents in these communities mobilize resources to meet their daily food needs.

Lack of access to balance diets may have consequence for increasing risks of stunting, wasting and underweight particularly for children together with other conditions that may retard early child growth and development (Ruel, 2002; Morris et al. 2002). In addition, consumption of monotonous diets given the sedentary nature of lifestyles in these communities may also increase the risk of obesity and chronic, non-communicable conditions (Agyei-Mensah and de-Graft Aikins, 2010; Kennedy et al. 2010). The Women Health Survey of Accra (WHSA-II, 2009) reported more than two-thirds (66.6 percent) of the women surveyed were overweight and obese whereas in Dake et al.<sup>1</sup> (2010) prevalence of obesity increased 1.2 folds from 25.5 in 2003 to 30.5 percent in 2008. These have consequences for

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<sup>1</sup> Dake et al. (2010) "Socio-demographic correlates of obesity among Ghanaian women". *Public Health Nutrition* 14(7), 1285-1291.

increasing the double burden of disease especially among the aged and gradually descending to the relatively younger age bracket.

It is also estimated that 23.6 percent of Accra's population are food insecure, consuming less than 80 percent of the caloric requirement but spending over 50 percent of the budget on food (Anarfi and Ahiadeke, 2006; Lyon, 2003). Approximately 62.2 percent of those in the lowest quintile are food insecure. Twenty two percent of children in food insecure households were stunted (Maxwell et al. 2000). Household expenditures on the food of the urban poor in Accra range between 60-80 percent of the total household budget (UN-Habitat, 2001; Maxwell et al. 2000; Tabatabai, 1993).

Filthy environment, choked gutters and refuse dumping near places where foods are prepared and sold are indications of susceptibility to diarrheal diseases in these shanty communities (Anarfi and Ahiadeke, 2006). Such illness particularly in children may retard early childhood growth and development. Maxwell et al. (2000) found that 16 percent of the urban poor in Greater Accra and 22 percent in Ghana (CIWQS3) do not have access to toilet facilities and therefore, defecate in unoccupied spaces and gutters. Similarly, among the urban dwellers, 22 percent of children less than three years suffered from diarrhea as against 19 percent in the rural areas (GSS, 2003; 1993) which has great implication for food utilization e.g. leading to poor micro-nutrient absorption in the body. Gastro-intestinal infections are known to be associated with high levels of bacterial contaminations of street foods than homemade foods (WHO, 2002 as cited in Mensah et al. 1995).

Recent studies have suggested that ethnic composition is associated with numerous socio-cultural underpinnings (Codjoe and Owusu, 2011; de-Graft Aikins, 2011; 2010; Badasu, 2004 and Songsoore et al. 1995). They have elaborated on the how societal norms, beliefs and taboo related issues which may either inhibit diverse food consumption leading to under nutrition or over nutrition. For instance, among the Ewe of Ghana foods such as okro, snails, ripe plantain are abhorred since they have consequences for pregnancy terminations (miscarriages), a child born may become flabby which would delay walking or drool too much (see example de-Graft Aikins, 2011 and Codjoe and Owusu et al. 2011; Badasu, 2004). Also, de-Graft Aikins (2011; 2010) demonstrated how culture influences dietary patterns. For instance, some Gas associated beauty with fatness ("if you are fat, then you are beautiful"-), also fatness was associated with wealth or better living condition as opposed to thinness for those who are stingy and poor. These often stigmatized and ostracize both women and men. These lay

thinking cuts across other ethnic groups in Ghana and not different from what happens in other parts of sub-Saharan Africa and the world over. This therefore, pushes women and men to eat unhealthily particularly foods that may allow them gain huge bodies (fat) such as oily/fatty foods, energy dense foods. Coupled with sedentary lifestyle and occupations within such communities, these exposes those to the risk of obesity which is also associated with cardiovascular disease, hypertension and diabetes thus increasing the double burden of disease (de-Graft Aikins, 2011; 2010; Lancaster et al. (nd); Vorster et al. 2007; Vorster, 2002).

Consequently, if the urban sprawl characterized by overcrowding and unemployment continues over time, then these communities are likely to be hard hit by the scorch of food insecurity (poor dietary diversity) and its negative consequences. In the words of Clover (2003), food security constitutes a necessary but insufficient condition for an individual's attainment of an adequate level of social welfare. From the work of Sen (1981) and his successors (Devereux, 2001; Edkins, 1996; Keen, 1994; de Waal 1989; Rangasami, 1985) we know that food insecurity and famines can occur irrespective of the aggregate availability of food or even its aggregate consumption. Food insecurity is often a result of weak institutions, or state failure to take measures to protect citizens' legal or extralegal exchange of entitlements in the face of conflict, war, drought, or floods, (Sen, 1981). Nonetheless, this has even become more complex coupled with the paucity of data which need not be underestimated.

In addition, significant to this study is that urban livelihood, food security and health indicators indicate that the low income areas of Accra are worse off than the rural areas of Ghana. This similar situation is not peculiar to Accra only. For instance, it was found that nutritional and health outcome for children in Nairobi slums were worse off than for their rural counterparts (cited in Anarfi and Ahiadeke, 2006) and so was the situation in Zambia and Malawi (Kyobutungi et al. 2008).

All of the above are relevant for assessment of urban food security. Food-based approaches have been recommended as the first priority to meet micronutrient needs (Kennedy, 2010). Monotonous diets based mainly on energy dense foods, but not micronutrient starchy staples are predominant in food insecure areas and contribute to the burden of malnutrition. Information collected on dietary diversity can be used to inform a baseline assessment,

monitoring and evaluation of food security at the individual, household, national and global levels.

You need to compress the things said so far into a more compact and precise manuscript format. The current thesis format makes it too lengthy.

### **1.3 Rationale of the study**

Poverty, food insecurity and malnutrition in Africa were for decades viewed as largely if not entirely rural problems as postulated by different views from Clover (2003); Smith and Haddad (2002) and Maxwell et al. (2000). Because of the urban-rural differentials, lessons learned in rural context may not be applicable to policy in cities. Currently, food insecurity among the urban poor is alarming, aggravated by the natural increase and rural-urban migration (Owusu and Afutu-Kotey, 2010).

Also, focus on food availability as a single component of food security may grossly undermine the efficiency of programme interventions (Codjoe and Owusu, 2011; Codjoe, 2007; FAO, 2004). The study therefore, examines the utilization dimension of food security with emphasis on dietary diversity as an attractive indicator of food security (FAO, 2011; Kennedy et al. 2010; Arimond et al. 2010).

The current nutrition transition that is characteristic of Ghana makes this issue even more relevant to address the growing epidemic of obesity, diabetes and cardiovascular disease (Lancaster et al. (nd)). Ghana is faced with the double burden of under-nutrition and over-nutrition which is evidenced by the high prevalence of poor nutritional status in children and adults and chronic diseases in urban areas (Vorster, 2002) including high blood pressure and high body mass index (Vorster et al. 2007; Van Rooyen et al. 2000). This may be due in part to the fact that urbanization is often accompanied by increased consumption of processed and high caloric foods and decreased energy expenditure (Glew et al. 2004) without necessarily balancing diets (increasing varieties).

Dietary diversity (DD) relates to nutrient adequacy and to diet variety, which are two of the main components of diet quality. The scores that reflect DD are key elements to any comprehensive analysis of the food security situation at the individual, household or community level. Both Household Dietary Diversity Score (HDDS) and Food consumption Score (FCS), but not Individual Dietary Diversity Score (IDDS), are used to identify food access and consumption problems at the population's level.

Dietary diversity is a valid outcome in itself and either directly or indirectly may lead to improved health outcomes such as birth weight (Rao et al. 2001), child anthropometric status (Hatloy et al. 2000; Onyango et al. 1998 and Allen et al. 1991), improved hemoglobin concentrations (Bhargava et al. 2001), reduced incidence of hypertension (Miller et al. 1992), reduce the risk of mortality from cardio-vascular diseases and cancer (Kant et al. 1995) as cited in Hoddinott and Yohannes (2002) and obesity (de-Graft Aikins, 2011). All scores can also be used as part of any food security and nutrition information system, at the regional or national level. They can help in early warning systems and in targeting of interventions. They are also used at the community level for the evaluation of programmes aiming at improving population's food security and nutrition.

The study however, acknowledges that despite past and current efforts to standardize dietary diversity as a tool for measuring food security, additional validation is still needed to reach a consensus on their use in various contexts (Kennedy et al. 2010). In addition, they should not be used alone as they reflect only part of the food and nutrition security components (i.e. food consumption). They have been shown to be associated with various other measures of household food security related to food access. However, they are not directly related to the nutritional status of household members (FAO, 2010).

As indicators of the diet quality, Dietary Diversity (DD) scores are of direct relevance to the attainment of Millennium Development Goal (MDG 1), which aims at eradicating extreme poverty and hunger; Achieving better DD is also of great help in pursuing MDGs 4, 5 and 6. Situations of hidden hunger may prevail especially in urban low-income areas and it is misinterpreted for extreme hunger, and if it persists, then it can sprawl into extreme nature. Dietary diversity as an indicator would therefore act as an early warning system not only to inadequacy of food but also variety being consumed.

However, the vexing challenge remains that little is known about the magnitude or consequences of the appalling conditions in the urban poor areas. All these undermine efforts to better understand the plight of the urban poor which is further compounded by the paucity of data. The false picture policy makers always get from data indicating that urban areas have better indicators than their rural counterpart, makes them think urban areas are always rosy. Slums and other shanty settlement areas where urban poor household reside have become the new hubs of these catastrophes such as poverty, food insecurity, and malnutrition.

Notwithstanding the limitations of the study on the different approaches to examining household food utilization, it is still relevant to understand and employ multifaceted ways of examining urban household food security particularly of the urban poor. This was one of the reasons food diversity was evaluated in 2009 (current study) by the Human Sciences Research Council (HSRC) of South Africa as an additional measure of food security, since one measure of food security is not usually used on its own.

#### **1.4 Objectives of the study**

**General Objective:** To examine the relationship between household demographic and socio-economic characteristics and food utilization of the urban low-income population with emphasis on dietary diversity.

Specifically, the study seeks to;

1. Describe the dietary pattern of the urban low-income households with an emphasis on dietary diversity.
2. Examine the relationship between household demographic and socio-economic characteristics and dietary diversity of the urban low-income population.
3. Examine the coping mechanisms of urban low-income households use to improve their dietary diversity.

#### **1.5 Literature review**

##### **1.5.0 Introduction**

The world's population is increasingly becoming urbanized as a result of both natural increase and rural-urban migration (Owusu and Afutu-Kotey, 2010; Kennedy, 2003; UN Population Division, 2002). There has been an increasing concern about the impact of the growing levels of urbanization particularly in sub-Saharan Africa (SSA). It is projected that by the year 2025, 61 percent of the world's population will be living in urban areas. Many will be living close to or even below the poverty line making it a challenge to feed this ever expanding urban population. In the 1960s, there were two in ten inhabitants living in cities in SSA and Asia whereas it is estimated that by 2025, more than 60 percent of the population will be living in urban areas. The already high urban growth rates, is also projected to double in less than 20 years and this increase may compound the problems of limited space for constructions and

farming. For instance, Kampala growing at 5.2 percent, Addis Ababa at 5.2 percent, and Nairobi at 4.3 percent and Accra at 4.6 percent per annum (FAO, 2009; UN-Habitat, 2001). If this urban growth rates is to continue unabated, new and unprecedented challenges for food security will be inevitable.

With regards to the city of Accra, urban life has attracted able bodied rural migrants who form the backbone of the agricultural economy thus affecting food production and supply. This has further created food deficit in Accra that is exacerbated by the fact that agriculture represents the smallest portion of Accra's economy. Furthermore, sharp increases in the price of food have made it difficult for low-income families to access healthy and affordable food.

### **1.5.1 Urban food systems**

As urban food demand rises, food supply and distribution systems have to supply the inhabitants of cities with increasing amounts of food coming from ever more distant production zones and/or from more intensive production systems (FAO, 2004). Urban areas will provide the necessary incentives for increased national production made possible by more remunerative producer prices. Linkages between production and consumption areas need therefore to be strengthened, to contain the likely increase in marketing costs.

Myriad studies have shown that urban diets are strongly influenced by prices and incomes but they are also influenced by lifestyles, social relationships, marriage patterns, family structures, and availability of packaged and processed foods, advertising and the media (Maxwell et al. 2000; Atkinson, 1995). Processed and packaged foods are more widely available in urban than in rural areas, in part because food manufacturing sectors are based nearby. Urban markets are more likely to carry imported food items.

Maxwell et al. (2000), demonstrate that the share of food expenditures spent on street foods and meals away from home varies by expenditure groups particularly highest among those with lowest expenditure groups. They further posited that it is fairly complex to understand how the nutritional value of urban diets is affected by these factors. This prompted them to ask questions about whether the shifts in consumption of street food compromise the diet. How increased consumption of street food contribute to calorie intake? There is need to assess the availability of calories at household level and analyzing the major sources of calories

would gear towards understanding the intricate relationship between nutritional values across the expenditure groups.

Urban food markets and local distribution systems play a crucial role in their ability to sustain the ever growing urban population whilst increasing demands for food (Lyon, 2003; Maxwell, 1999). Meanwhile, crops such as roots, tubers, and vegetables have erratic production pattern because of the brutal weather (Anarfi and Ahiadeke, 2006). Nevertheless, despite these challenges, the country is still able to produce more than half of its cereal, meat and fish needs, locally, further emphasizing the need for efficient transport mechanisms to bring these goods to the market (FAO, 1998).

Kennedy (2003) provides a pertinent argument about the relationship between access to food and urban dietary patterns which is seen to have largely changed the urban dietary patterns. He argues that apparently, a larger number of women in the workforce have less time to prepare meals for the family, commuting distances are tremendous and a substantial amount of time spent commuting to and from work, living spaces are smaller and often not equipped with kitchens or outdoor cooking spaces and lastly there is decreased access to natural fuel sources. All these factors influence how food is accessed in the urban areas which then have implications for its utilization. Due to the fast-paced urban lifestyle, many urban consumers rely on pre-prepared or convenience foods.

Street foods play an important role in the food access strategies of the urban poor. For instance, Maxwell et al. (2000) found that in Accra, 32.0 percent of the household budget went to purchase street foods; half of this budget went to food purchased for children, who are often given money and decides on their own which type of food to purchase. A study in Kenya compared the frequency and types of street food purchased by socio-economic status. Persons living in slum areas consumed street foods more than families living in low-middle income neighborhood (van't Riet et al. 2001). In Tanzania, urban food consumption pattern dwelled more on bread, cookies, vegetable oil, beef and milk (Mazengo et al. 1997) and similar patterns is demonstrated in Cameroon by (Mennen et al. 2000). All of these scenarios show urban tendency to consume foods with high energy density, but potentially with low micronutrients.

The urban poor are particularly vulnerable to price changes due to limited cash and cash reserves. Wholesale food markets and discount supermarkets are mostly located in the city

outskirts. These locations may not be favorable to urban poor due to lack of transportation, and inadequate municipal transportation systems (Kennedy, 2003). The urban poor often are obliged to purchase food in small neighborhood shops, which are more expensive and lack fresh produce. Most urban poor households neither have large food stores, nor do they have access to areas for own production due to overcrowding.

During the International Conference on Nutrition in Rome (1992), emphasis was made on the need for an interdisciplinary and inter-institutional approach to improving the quality and access to food by rural and urban consumers (Food and Agriculture Organization, 2008). However, one of the major challenges they expected in the forthcoming decades was to achieve an efficient distribution of nutritional and inexpensive foodstuffs to the poor sectors of urban inhabitants.

Pothukuchi and Kaufman (1999) elaborated on three key factors that may explain the invisibility of the food system in the urban context. Firstly, urbanites generally take the food system for granted; few see serious problems related to food access, availability and utilization. Secondly, the historical development of cities led to definition of specific issues and problems as urban predominantly in opposition to or in contrast with rural or agricultural. Thirdly, the technological advancement that mechanized farming, transportation, refrigeration, food processing and concerns about loss of agricultural productivity in rural terrain went unnoticed. Food was always “there,” unproblematic, even if no longer local. Most importantly, the urban poor and their food security have not only remained invisible but also undocumented (Hoddinott and Yohannes, 2002; Lourenco-Lindell, 1995).

The question about the challenges facing decision makers in the years to come is how to meet the rapidly increasing urban food demand whilst reducing dependence on imports and achieving an efficient and dynamic distribution of nutritious foodstuffs at reasonable prices to the poorest sectors of urban populations, while creating jobs in the food marketing and distribution sector (Nakabo-Sserwanyana, 2003). It is imperative to review the nature of urban environment and livelihood in an attempt to improve understanding and awareness of the challenges facing cities, particularly challenges in accessing and utilizing food. Urban environment offer mixed feelings and opportunities, constraints and consequences for women and children (Owusu and Afutu-Kotey, 2010).

### **1.5.2 Household dietary diversity (HDD)**

Food utilization in these contexts refers to the individual's social and biological capacity to make use of food for a productive life (Food and Nutrition Technical Assistant, 2004). In addition to the already frequently used measures, a Household Food Insecurity Scale (HFIS) which measures the experience of household food insecurity is being tested for future inclusion as an indicator. Household dietary diversity-the number of unique food groups consumed over a given reference period-is an attractive proxy indicator for the following reasons (FAO, 2011; Kennedy et al. 2010; Hoddinott and Yohannes, 2002); a more diversified diet is an important outcome in itself, and also associated with a number of improved outcomes in areas such as birth weight, child anthropometry, and improved hemoglobin concentrations. Kennedy (2010) and Ruel (2002) alluded to the fact that dietary diversity is highly correlated with factors like caloric and protein adequacy, percentage of protein from animal sources and household income. Even in very poor households, increased food expenditure resulting from additional income is associated with increased quantity and quality of diet (Maxwell et al. 2000). Other reasons relate to ease in data collection, which can be done at household and individual level, making it possible to examine food security at the household and intra-household levels.

Hoddinott and Yohannes (2002), presupposes that, in order to better reflect quality diet, the number of different food groups be calculated rather than the number of different foods consumed. They further argue that knowing that the households consume, for instance an average of four different food groups is an indication that their diets offer some diversity in both macro and micro nutrients. This is a more meaningful indicator than mere knowing that the households consume four different foods, which might all be cereals, may not necessarily be a true reflection of quality diet.

Propositions made are that in addition to investing in short term interventions, which are vital, African countries should increase their investment in long term interventions, such as dietary diversification, food sufficiency and biofortification (Mwaniki, 2003). These have lower maintenance costs, a higher probability of reaching the hard to reach vulnerable and marginalized poor people and thus produce sustainable results. Dietary diversity still remains one of the best ways to provide nutritious diets to the sustainability of any population (Hoddinott and Yohannes, 2002; Swindale and Bilinsky, 2005). It is possible to obtain the right mix of food to alleviate malnutrition from that which is locally produced. There is the

need for developing countries to increase the production of animal products, fruits, pulses and vegetables. Codjoe (2007) examines food supply and utilization in Ghana between 1960s-2000s. He found that the production of energy dense foods such as cassava, maize and plantain in Ghana has been increasing over the five decades and later yam production increased in the 1980s. The question here still remains whether this increase in production and supply of food would translate into high levels of accessibility and utilization.

### **1.5.3 Food production and supply**

The FAO, (2004), exhibits an interesting pattern in food production in Africa. The data indicate that cereals, roots and tubers production is highest in Western Africa and lowest in Southern Africa. Conversely, vegetables and fruits production is highest in Eastern Africa and North Africa with a relatively lower productivity in Western Africa. Whereas, primary protein sources such as pulses, eggs, meat and milk also highest in Eastern Africa with quite a disproportionately lower level in Western Africa (Mwaniki, 2003). The fluidity of this data may suggest that Eastern and Central Africa should increase their roots and tuber production so as to reduce their dependency on cereals whereas Western Africa should increase their production of fruits, vegetables and animal products to reduce their dependency on cereals, roots and tubers. These differences may be attributed to environmental factors, cultural values, as well as taste and preference. However, no single factor may elaborately explain these differences in isolation but rather multiple causations.

Food security is a complex multifaceted issue which encompasses components of availability, access and utilization (Ericksen, 2007; Oh and Hong, 2003 and Ingram and Brklacich, 2002). Urbanites take food system for granted and see it largely as a rural problem. Within the urban areas, there are also clear cut variations in food access and utilization between the low income groups and the wealthier class. Foods available for consumption in urban areas are primarily produced from rural or peri-urban areas or imported. In addition, much of the urban foods available is processed either locally or imported in already processed form (Anarfi and Ahiadeke, 2006; Kennedy, 2003 and Maxwell et al. 2000).

Anarfi and Ahiadeke (2006) revealed that in the city of Accra, periods of the year when food often becomes scarce are correlated with weather. Common knowledge from the four communities of Sukura, Old Fadama, Nima and Mamobi (commonly referred by respondents

in the survey areas as Zongo<sup>2</sup> community) revealed April to July as particularly bad periods for food supply. They further propound that this period usually coincide with food growing season in the country. Others referred to Easter as bad periods for food supply. This specifically relates to start of the rainy season which is often characterized by heralded storms. This adversely affects plantain which then is unable to withstand the storm. Since it's a staple food in many homes and also one of the major food crops in Agbogbloshie including fruits and vegetables, its absence is particularly felt through hiked prices of these commodities. Finally, that this period is also the new planting season, which means other food stuffs are also scarce. These have implication on food supply in urban areas whose consequences are seen in high prices of food items, inadequacy and limited diet variety.

Like the rest of Accra city, urban dwellers get most of their food supply from upcountry or supplements from peri-urban farming. For instance Nima has quite a big and regular market, which also serves Mamobi. Similarly, Old Fadama, James town and Ussher town is very close to two big markets: Agbogbloshie and Konkoma. These markets serve as depots where foodstuffs brought from upcountry are offloaded (Anarfi and Ahiadeke, 2006). The latter is well known for yams and the former plantains, a vegetables and fruit. However, within these communities, there are minor markets and stalls, which serve people with their immediate food needs.

Proximity to sources of foods acquired by the household members is significant in determining access to food. The challenge here could be the households' has the ability to purchase foods regardless of the closeness to the source of food given the scrambling lifestyle in such overcrowded setting with precarious income sources. Among the urban poor, this is particularly adverse in the slum settlements under sheer lack of space and poor living conditions. The underlying concern is that it is very difficult for these communities to have access to public distribution system. They have to buy their food from common market at competitive prices.

Clover (2003), Morris et al. (2002) and Hoddinott and Yohannes (2002) propounded that food security and sufficiency differ considerably between households and intra-households.

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<sup>2</sup> Zongo community is name given to a suburb of towns and cities in Ghana settled mainly by migrants from the northern part f the country (Anarfi and Ahiadeke, 2006).

Households that seem to be fully assured of food security often are the rich and middle income households. Similarly, as observed that females are the most predominantly poor, their households are less self-sufficient assured of food than the male headed households. Even though some studies argue that children in female-headed households are more likely to receive better care and therefore are well nourished. This aspect of the literature review also needs to be compressed to issues that relate with the core issue you are talking about.

#### **1.5.4 Urban environment and food safety**

Findings from the qualitative investigations by Maxwell et al. (2000), suggest that there was a strong link between reliance on street foods and the prevalence of gastrointestinal infections, presumably because street foods are easily contaminated (World Health Organization, 2000). Manifestation of these situation were complaints of diarrhea or “stomach upset” conditions that were often blamed on poorly cooked food or the sanitary conditions such as near open gutters under which the food was prepared or sold as is the case in Ga Mashie (Anarfi and Ahiadeke, 2006). Levels of contamination of street foods may indeed be high (FAO, 1996). Maxwell et al. (2000) and suggestions by Akpedonu (1996) indicate that snack foods purchased on the streets of Accra are generally safe from contamination unlike prepared foods, especially uncooked vegetables (e.g. salad condiments served with prepared meals).

In addition, other studies on food contamination in Accra have also noted that street foods may not be the only cause of bacterial gastrointestinal infections since the rate of contaminations of home prepared foods are also high (WHO, 2002; Mensah et al. 1995). In a survey conducted on bacterial contamination of street food by World Health Organization (WHO) regional office for Africa in Ghana, 511 samples of these foods were within acceptable limits. However, of the 26 types of foods (sampled from multiple street vendors), four items; salad and macaroni dishes, red pepper, and fufu<sup>3</sup> had total bacterial counts above the acceptable limit (WHO, 2002; Mensah et al. 1995). The urban low income group particular women and children are the most hard-hit by the impacts of such filthy condition.

Nakabo-Sserwanyana (2003) elucidated on how pertinent it is for food security research in Uganda to be conducted and further highlighted the paucity of studies on food security at the

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<sup>3</sup> Fufu is boiled root, tuber or starchy fruits that is pounded (usually swallowed with soup)

household level. While some studies have found that female headed households are more vulnerable to the scorch of food insecurity than male headed households, other studies have found the reverse. It is imperative that issues of status of women and increasing proportion of female headship need to be incorporated into a study of this kind.

Clover (2003) second that no human right has so frequently been violated in recent times as the right to food even though the most enshrined rights in international human rights law. In order to maintain food security, households need a stable food supply (Codjoe and Owusu, 2011; Codjoe, 2007; Clover, 2003). However, shocks to food security of the urban poor are imminent given the myriad of problems they face and some of these are diametrically opposed to each other creating more adverse outcome. Like rural households, urban poor households cope with food shortages with limited or no government support (Nakabo-Sserwayana, 2003). Maxwell et al. (1998) and studies carried out elsewhere reported that urban farming enhances household food security and nutritional status. However, if the urban poor lack effective access to urban farming land (Anarfi and Ahiadeke, 2006), then what other strategies do they use to minimize the consequences of food insecurity? More importantly, how do urban poor households cope with the fluctuations of market prices and shortfall in their income?

### **1.5.5 Socio-cultural factors and food utilization**

Codjoe and Owusu (2011) found that food utilization may be related to ethnic composition of some communities. For instance, pregnant women are forbidden from eating ripe plantain in Boakyekrom, while in Mim Kyemfere community members are forbidden from eating tortoise, alligators and cocoyam and in Xedzodzoekope eating snails, alligators and certain fish species is abhorred. A study by Badasu (2004) among Ewe migrants in Accra found that pregnant women are forbidden from eating okro and ripe plantain since they are slippery and may cause miscarriage. Also, children are forbidden from eating fish, meat and eggs since they might become spoilt or become thieves. This is not different from other parts of Ghana. For instance, Nabigne (2004) and Songsore et al. (1995) found that among the Dagaare communities in Northern Ghana, leaves of baobab are particularly forbidden to women since it may cause miscarriage (see more examples in de-Graft Aikins, 2011 and de-Graft Aikins, 2010). These have profound implications for reducing dietary diversity and thus nutritious

diets particularly in predominantly migrant community with varied ethnic origins such as Agbogbloshie.

de Graft Aikins (2011) used the social representations theory (SRT) and its central concept of “cognitive polyphasia<sup>4</sup>” in order to understand ways by which groups and individuals draw diverse and often opposing ideas on different social knowledge for instance culture, scientific, religious and common sense knowledge. This was in relation to role of culture, in the Ghanaians perspective of food, fatness and child bearing presents the risk of obesity for women particularly in food consumption and physical activity. These are indications that it would grossly undermine interventions if focus is largely on agro-climatic conditions alone that affect the food systems leading to food insecurity. The use of other fields of inquiry will allow for such rigorous examinations in the issues of food security for better interventions.

#### **1.5.6 Climate change/variability and food security**

Climate change/variability related impacts on the food systems in the context of urban areas remain unclear and undocumented. Until recently, most assessments of the impact of climate change/variability on food and agricultural sector have focused on the implications and global supply of food with less attention on other components of the food chain (FAO, 2008; Erickson, 2007). There is an indication that climate change is real and its impacts are already being felt. Four aspects of food security are being affected namely; food availability, food accessibility, food utilization and food system stability (Clover, 2003). The effects are being felt in the global food markets in urban areas, while rural areas experience crop failures and decline in yields. Supply chain are disrupted, markets prices increases, assets and livelihood opportunities are lost, purchasing power falls, human health is endangered and affected people are unable to cope. This makes it legitimate to study the urban poor who are more vulnerable to the impact of food system disruption with respect to dietary diversity. Although climate change and variability may not be the focal point of this study, it must be put at the forefront of national and community level development agenda with relations to its adverse impact on food system.

Codjoe and Owusu (2011) demonstrate the potential impacts of climate change/variability that affects the three critical facets of food system which have adverse implications for food

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<sup>4</sup> ‘The dynamic co-existence.....of distinct modalities of knowledge, corresponding to defined relationships between human beings and their surroundings (de-Graft Aikins, 2011)’.

security and how communities subsequently adapt to these changes. In order for them to examine the empirical linkages between climate change and food security, they selected the Afram plains which is one of the poorest districts in Ghana with a case study of three communities; Xedzodzoekope, Mim Kyemfere and Boakyekrom. Xedzodzoekope is a predominantly Ewe community and fishing is the most dominant economic activity supplemented by farming, cattle herding and charcoal production. Replicating such a study in the context of the urban areas may yield some fruitful results that may give headway to conceptualizing food security although this needs to be done with some caution since these communities were rural as they may have peculiar conditions compared to an urban environment.

Changes in weather also affect food storage and processing. High temperatures required for drying, too much precipitations cause food rot (moulds) leading to wastage or contaminations. This affects the production area which in turn reduces supply to the receiving areas. This means limited variety and rise in price due to food scarcity as demand rises. This area also calls for further research especially in the context of the urban poor communities.

Undoubtedly, a huge gap still exists in understanding the causal link between food security and numerous stressors such as climate change and variability and poverty. Codjoe and Owusu (2011) pinpoints the limitation of the Global models and projections of food supply for ignoring regional inequalities and absence of Global Environmental Change (GEC) and more specifically climate change and variability. To expound further, empirical facts about climate change related issues and its impact on food systems still remains bleak in the “urban” context since these are “non-agricultural areas” (Toynbee, 1970). It thus, makes it complex to establish a causal link between climate variability and food systems activities and outcomes except through environmental feedbacks.

Attempts have been made to examine the relationship between the GEC and health which may also have direct or indirect implications on food utilization. The effect of climate change ranges through a number of path ways, increased frequency and intensity of heat waves, reduction in cold related deaths, increased floods and droughts, changes in the distribution of vector-borne disease which all converts to high risk of disasters and malnutrition (Haines et al. 2005). The effect of these is particularly adverse among low-income populations. Anarfi and Ahiadeke (2006) and Maxwell et al. (2000), postulates that unhygienic foods, poor

quality water and unsanitary environments as a cause of diarrheal diseases in these communities. This has implications for lowering appetite, poor absorption of food micronutrient in the body and avoidance of certain kinds of food because of the social environment within which they are prepared or sold.

Many health outcomes are sensitive to isolated extreme events such as heavy rainfall and high temperatures. For instance, in the Afram plains of Ghana, the volume of annual rainfall has not changed much over years but rather there has been a drastic change in the patterns (Codjoe and Owusu, 2011). However, even small temperature increases and precipitation changes can result in measureable impacts on malaria, diarrheal episodes, injuries related to floods, and malnutrition. Following incidence of floods, increase in diarrheal and respiratory diseases are reported, in both high and low income countries, transmission increased where there is crowding of displaced populations, which have implications for food utilization in general.

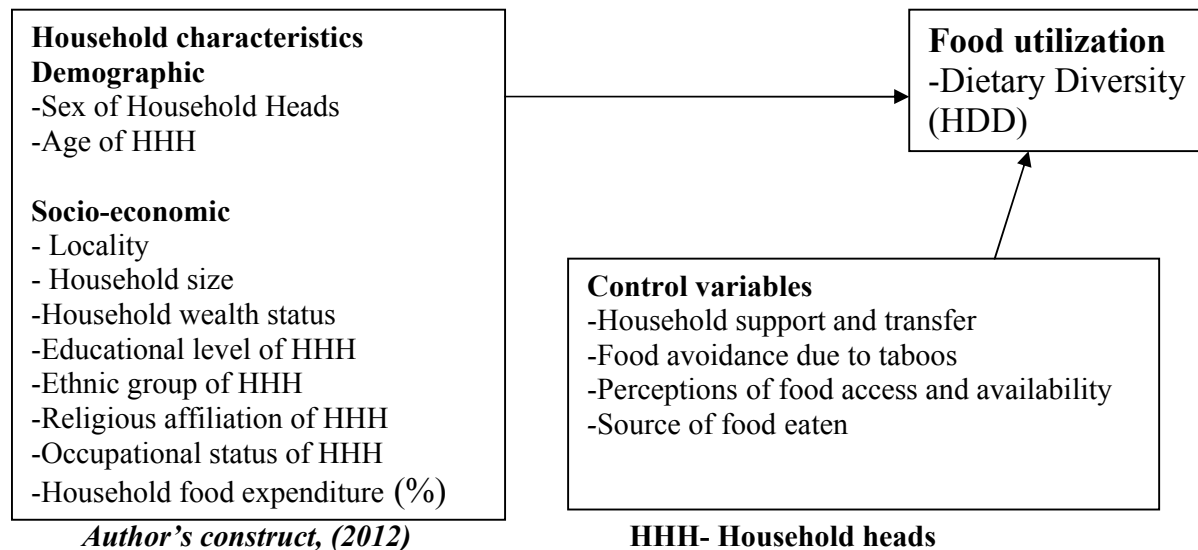
Fuhrer (2003) and Amthor (2001) posited that the singular focus on production has consequently amplified food insecurity in many parts of the world. And that solving these consequences require a more comprehensive approach that incorporates myriad spheres of planning and numerous factors to be considered such as; socio-economic, political, or environmental in nature as indicated by Codjoe and Owusu (2011), Ericksen (2007) and Clover (2003).

In a nutshell therefore, an Editorial Comment in the African Security Review in 1996 summarized three key aspects of the then new thinking on security. These included; 1) “**Concerns**” - the pursuit of democracy, sustainable economic development, social justice, and the protection of the environment, 2) “**threats**” – armed forces and challenges to sovereignty and territorial integrity, poverty, oppression, injustice and ecological degradation and 3) “**policies**” – less state centric and more attuned to meet the basic needs of people. These factors do not only nicely illustrate the concerns, threats and policies with regard to national or international security, but also to the importance of food security. Food security should be of national and international concern, especially as global problems such as the rise in food prices and global warming serve to put already vulnerable sectors of global society at

further risk. Guided by the above literature, the study seeks to test the following hypotheses below;

### 1.6 Conceptual Framework

**Figure 1.0: A conceptual framework showing the link between urban household characteristics and food utilization (dietary diversity)**



The framework explains the linkages between urban household characteristics and food utilization with respect to dietary diversity, controlling for confounding factors. The framework indicate that demographic factors such as sex and age of the household heads influence dietary diversity of the rest of the household members. In addition, socio-economic factors not limited to locality, household size, wealth status, educational, occupational status, ethnic groups, religious affiliation and household expenditure all affect household dietary diversity. It is beyond the scope of this paper to discuss in detail the myriad factors that influences food utilization particularly of the low income groups. Nef (1995) with further contributions from Kennedy et al. (2004) posited that while cities are generally considered engines of economic growth, “hyper-urbanization” or “over-urbanization” occurs more as a result of poverty than affluence especially surrounding sprawl which is more associated with

conditions of deprivation than prosperity. The urban environment appears to exert an influence on dietary habits. For instance, increasing household size means more mouths to feed, thus affordability of food drives food choice and adequacy of dietary intake (Anarfi and Ahiadeke, 2006). Social drivers such as the main kind of occupation urban dwellers engage in also influences their ability and choice to acquire adequate diet.

Hoddinott and Yohannes (2002) also hypothesized that an increase in household expenditure on food has a positive association with high dietary intake. Codjoe and Owusu (2011) postulates that in such an African community such as the Afram plains, households with higher proportion of males could be advantageous or stand a better chance to larger incomes hence ease in food access. In addition, social support network such as financial or in-kind assistance from relatives, friends, or donation from elsewhere could supplement household income in times of food scarcity, low production, or when market prices catapult.

Peculiar to the study, is the localities (space) which may show significant differences. For instance, Agbogbloshie comprises of more migrants from other regions of Ghana and neighboring countries. Maxwell et al. (2000) and Anarfi and Ahiadeke (2006) found that migrants are more vulnerable to the scorch of food insecurity than non-migrants. Kennedy et al. (2004) and Levin et al. (1999) alluded to the fact that urban men and women are driven into the work force by the overriding need for an increase income to pay for food, shelter, clothing and other household expenses. Working hours and commuting times are often long and with growing family members entering the work force, there is less time available to prepare food and hence majority resort to consuming meals outside the home.

Religious affiliations may also have implications on food utilization as some anecdotal report suggests that certain kinds of nutritional healthy foods are not consumed by Catholics. For instance, olive oil is only used for religious purposes (anointing etc) as well other religious

doctrines such as Muslims are prohibited from eating pork. Ethnicity is also a significant predictor of food utilization due to socio-cultural diversity and belief systems such as taboo/tortems related to food which may undermine an individual or household's ability to consume variety of nutritional healthy foods (see examples in Codjoe and Owusu, 2011; de-Graft Aikins, 2011; Badasu, 2004 etc).

### **1.7 Hypotheses**

1. Household size is negatively correlated with dietary diversity
2. Educational level of household heads is positively correlated with dietary diversity
3. Household expenditure on food is positively correlated with dietary diversity.

### **1.8 Methodology**

#### **1.8.1 Research design**

The study uses data from the second round of the EDULINK/AARC<sup>5</sup>/GPHRCF<sup>6</sup> (RIPS<sup>7</sup>/NYU<sup>8</sup>) urban poverty and health project, conducted in November/December, 2011 under the theme "Population Training and Research Capacity for Development (PopTRCD)." It was conducted by the Regional Institute for Population Studies (RIPS), University of Ghana and its partners mentioned above with the aim of investigating urban poverty, health, food security, and climate change/variability related outcomes, particularly of the urban low-income population.

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<sup>5</sup> African Adaptation Research Centre

<sup>6</sup> Global Public Health Research Challenge Fund

<sup>7</sup> Regional Institute for Population Studies

<sup>8</sup> New York University

The study has focused on three indigenous communities of James Town, Ussher Town and Agboghloshie situated along the coastal areas of Accra city, Ghana. The latter is characterized by largely migrant populations (Maxwell et al. 2000). In order to investigate the food utilization components of these communities designated as urban poor, several methodological approaches was used to aid in answering the research questions.

There are three basic components of the food system outcomes with several elements under each as suggested by myriad studies; food availability (production, distribution and exchange), food accessibility (affordability, allocation and preference) and food utilization (nutritional value, social value and food safety) (Codjoe and Owusu, 2011; Ericksen, 2007; Gregory et al. 2005; Clover, 2003; Ingram and Brkalcich, 2002). The study specifically focused on the latter (food utilization), using household dietary diversity as a proxy measure of food security and nutritional adequacy (FAO, 2011; Kennedy et al. 2010).

### **1.8.2 Description of study area**

The city of Accra is a sprawling metropolis with rapid regeneration of new suburbs and pockets of partially built environments (Owusu and Afutu-Kotey, 2010; de-Graft Aikins and Ofori-Atta, 2007). Rural migrants and destitute indigenous communities often utilize these spaces as temporary dwellings. Like other slum communities in Accra, the communities in the study live in kiosks and makeshift wooden shacks; others live in uncompleted building after carrying out minor structural work (e.g. patching up uncompleted windows, doors and ceilings with scrap wood, aluminum, polythene and netting). They lack basic amenities such as pipe-borne water, sanitation (bathrooms and toilet) and electricity (de-Graft Aikins and Ofori-Atta, 2007; Anarfi and Ahiadeke, 2006 and Maxwell et al. 2000).

The smaller units in compound households is the basis of the definition of a Ga household for the survey, since they were defined largely in terms of consumption and were comparable in

terms of composition to households in other areas of the city as stated in Maxwell et al. (2000) and Levin et al. (1999). The definition of a household became *a group of people who eat from the same pot when food is prepared at home and who get money for street food from the same source*. While these households heavily depend on cash exchange and reciprocity, also overcrowding means that some people, while not accurately categorized as “homeless” in the usual sense of the word, do not have a permanent place where they sleep. They may sleep in shifts, and people who are part of a household may not sleep with that household at all (Ga Mashie study team 1996; Fayorsey, 1995).

For this reason, especially for the kind of households that predominate Accra’s migrant communities, co residence does not define these households and because of heavy reliance on consumption of street foods, consumption from a common pot alone is not an adequate definition of a household (Maxwell et al. 2000). Also, the fact that children often eat somewhere else outside the home of their mothers needs to be taken into account when defining a household in this context.

As cited in Maxwell et al. (2000), Fayorsey, (1995, 106) noted that

*Current urban Ga households are characterized by a group of individuals engaged in productive activities together, but they retain the fruits of their labor [individually]. Such households are characterized by exchange rather than by a pooling together of [income]. There is, however, a great deal of reciprocity. As members of matricomplexes, urban Ga women are expected to feed and care for any child belonging to the matricomplex when the children’s mothers are not around....*

Maxwell et al. (2000) provide evidence of a typical compound household as described by a Ga woman in her late sixties. She described the basic composition of the compound: “I have children, and all my sisters have children, their children also have children, and our

grandchildren also have delivered, and all this constitutes our household.” Most of the adult women in the compound shared the same income-generating activity—the preparation and sale of *kenkey* (the local staple food made of fermented maize dough).

Household members are identified with reference to the head of the household who was defined as the “*person with primary responsibility to see that members are provided for in terms of food and care (even though the person may not be doing the actual provision of food and other support)*”. The de facto household head is the person who acts the role of household head in the (temporary) absence of the actual household head.

### **1.8.3 Sample selection procedure**

Data from a sample of 806 households distributed across 29 enumeration areas was collected. Two sets of questionnaires were administered, one at household level (actual household or de facto heads) and another at individual level (household members who were eligible i.e. 15-49 years old for females and 15-59 years old for male). This study was based on responses from the actual heads of house who responded to the food list section in the individual questionnaire. This therefore, reduced the sample size to 452 households to be used for analysis. This was because food frequency questionnaire (FFQ) used to measure dietary diversity were administered only to eligible individual respondents. This new sample size of 452 households was obtained after merging the two data files with respect to the characteristics of the household heads in the household data file.

### **1.8.4 Measurement of variables**

#### **1.8.4.1 Household Dietary Diversity (HDD)**

Dietary diversity in this study is a measure of the number of individual unique food groups consumed by household heads over a seven days period preceding the survey as in Kennedy

et al. (2010) and Ruel (2003). Usually the reference period varies depending on interest of the study, but most often the previous day or a week (FAO, 2011; WFP, 2009).

A seven-day recall period was used to capture the food consumption data using the consumption approach to include both foods consumed at home and outside the home irrespective of the time of meals (breakfast, lunch or supper). Nine different standardized food groups were scored to generate the household dietary diversity score (HHDS) ranging between (0-9) using Food And Nutrition Technical Assistant (Swindale and Bilinsky, 2006) and his predecessors such as Hoddinott and Yohannes (2002) and the Radimir/Cornell scale as suggested in Kendall et al. (1996). There is no international consensus on which food groups to include in the scores and the results of new research could justify changing the groups proposed in these guidelines. Each food group had a range of food items for which the household head was to mention the frequency of eating and where it was eaten (home, chop bar, street vendor, fast food joint and restaurant) in the last seven days preceding the survey.

The juxtaposition of the value of indicators of food utilization, together with the difficulties in obtaining detailed information, is the motivation for this study which offers to explore whether dietary diversity-the number of different unique food groups consumed by an individual or household over a given reference period-can act as an alternative indicator of food security under myriad of dynamic circumstances which may be socio-economic, cultural, political and religious. Field experiences indicate that respondents find such questions relatively straightforward, non-intrusive, and undemanding on time or recall to answers than data on caloric intake.

Household Dietary Diversity (HDD)<sup>9</sup> was created by the summation of the number of times different food items under each food group was eaten. This is on the assumption that every household should be able to consume a particular food group at least once in the last seven days. This is regardless of whether the food was eaten at home or outside the home and whether the food was taken at breakfast, lunch or supper

For instance, a new food group was created for those food items that need to be aggregated;

Example; starchy roots and tuber based staples as one of the food groups was derived by combining fufu, ampesi, fried tuber, roasted tuber and Gari.

This was done using this logical syntax;

Starchy roots and tuber based staples = “1” if the summation of the number of times household heads consumed (fufu + ampesi + fried tuber + roasted tuber + Gari) is greater or equals to 1.

Starchy roots and tuber based staples = “0” if the summation of the number of times household heads consumed (fufu + ampesi + fried tuber + roasted tuber + Gari) is equal to 0.

A check was done to make sure all the values under the food group (Starchy roots and tuber based staples) are either 1 or 0 and not greater than one (dichotomous). This was done for all the other food groups.

The Household Dietary Diversity Score (HDDS) was then computed by summing all the scores from the nine different food groups created. A check was also conducted to ensure the summation of the scores fall between 0 and 9. There are no established cut-off points in terms of number of food groups to indicate adequate or inadequate dietary diversity for the HDDS,

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<sup>9</sup> Number of unique food groups consumed over a given period of time (last 7 days period preceding the survey) as opposed to the number of times (frequency) different food groups were consumed.

although some studies suggest HDDS less than four represents poor dietary diversity, 4 as medium and 5 or more is an indication of high dietary diversity (Kennedy, 2010 and Swindale and Bilinsky 2005). For the purpose of this study, HDDS was continuous ranging between 0 and 9. This also used the mean HDDS for analytical purpose as indicated in tables presented in chapter three.

**Note:** Dividing the sum of number of times food groups was consumed by seven gives an average number of times food groups were consumed on a daily basis by household heads for the seven day recall period preceding the survey (use only at the bivariate analysis) in order to examine which particular food groups are most or least consumed across all predictor variables.

The HDDS score is derived based on the assumption that the consumption of one food group many times may not necessarily mean high dietary diversity, but rather if households are able to consume several unique food groups at least once within the reference period. Note: *Household dietary diversity score (HDDS) = Sum of the scores for all the nine food groups ( $0 \leq HDDS \leq 9$ ).*

The HDD scores was continuous ranging between 0 and 9 such that the closer the score is to zero, means insufficient diets and poor food security, whereas the closer the score is to nine, the higher the dietary diversity. Higher score indicate balanced diet and therefore, translates into more micro nutrients and thus a reflection of nutrient adequacy.

Households reported frequency of consumption of 76 food items which was categorized into nine different standardized food groups. The food groups included; 1) Cereals<sup>10</sup> and grain

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<sup>10</sup> Cereal based porridges/staples included; millet koko (Hausa koko), maize koko, rice water, oats, rice balls, banku/akple/tuo zaafi/kenkey, plain rice, jollof rice, fried rice and waakye.

products (porridge and staple based), 2) Starchy root/tubers and plantain based staples<sup>11</sup>, 3) Fats and Oil<sup>12</sup>, 4) Meat/Fish/Eggs<sup>13</sup>, 5) Fruits, 6) Processed foods (such as baked/roasted/boiled/fried snacks), 7) Soft drinks/sweets/sugar, 8) Milk and dairy products, 9) Vegetables (included cooked and raw). Alcoholic beverages also known as miscellaneous foods were excluded since not all household members' derived utility from it. Each of these food groups was used to calculate household dietary diversity score (HDDS) and has several food items under each food groups as adapted from the United Nations Food and Agriculture Organization food composition tables for West Africa, Rome, Italy (2010).

#### **1.8.4.2 Household characteristics:**

**Demographic:** Age of household heads was categorized in ten years interval (*15-50+ years*) and later entered in the model as a continuous predictor variable. Sex of household head (*Male headed and female headed*).

**Socio-economic:** Locality or location of households included; *James Town, Ussher Town and Agboghloshie*,

Household size or number of persons in a household (single member through to six or more persons in intervals of two persons per group) and considered as a continuous predictor variable of dietary diversity in the linear model.

Household wealth status: The construction of the wealth index included all household assets and utility services rather than a section of items. This broad criterion, with its greater

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<sup>11</sup> Starchy Tuber/root and plantain based staples included; fufu (all kinds), ampesi (yam, plantain, cocoyam), roasted and fried tuber (yam, plantain, cocoyam) and gari (soakings, eba, or with beans).

<sup>12</sup> Fats and oils included; red palm oil, vegetable (frytol, soy bean), butter, margarine and lard & animal fat

<sup>13</sup> Primary Protein included; livestock (goat, sheep, beef, pork), poultry (chicken, duck, guinea fowl) fish (tuna, herrings, salmon), shell-fish (crab, lobster, shrimp etc), eggs, sausage, other.

number of indicator variables, improved the distribution of households with fewer households being concentrated on certain index scores<sup>14</sup>. All variables included in the index were dichotomized. The next step in the index construction used Principle Component Analysis (PCA) to calculate an index score. Using this method, the indicator variables were standardized (calculating z-scores); then the factor coefficient scores (factor loadings) were calculated; and finally, for each household, the indicator values were multiplied by the loadings and summed to produce the household's index value. In this process, only the first of the factors produced was used to represent the wealth index. The resulting sum is itself a standardized score with a mean of zero and a standard deviation of one. The index score was then divided into five (5) cut-points (20 percentiles) in order to generate the household wealth index ranging from the poorest to the richest quintiles as presented in chapter two.

Household monthly food expenditure was also computed as a percentage of total household monthly expenditure on food in the last 30 days preceding the survey (in percentage 0-100% in intervals of 20 percent) and was a continuous predictor variable of dietary diversity.

Ethnic group of household heads was based on the standard categorization of ethnic group (GSS, 2008) and was merged for some ethnic groups as they presented to relatively few cases. This was to reduce statistical artifacts at the bivariate and multivariate level of analysis.

Educational status of household heads was categorized as heads with no *education*, *primary*, *middle/JHS*<sup>15</sup>, *secondary/SHS*<sup>16</sup> and *higher education*.

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<sup>14</sup> Rutstein SO, Johnson K (2004) The DHS Wealth Index, DHS Comparative Reports No.6, ORC Macro, Calverton, MD

<sup>15</sup> JHS (Junior High School)

<sup>16</sup> SHS (Senior High School)

### **1.8.4.3 Control variables**

This includes household support and transfers in the last 30 days preceding the survey operationalized as (*no support, money only, in-kind and both money and kind*) and regrouped into household who did not receive any support and those who received any support which was seen as coping strategy to improve dietary diversity.

Perceptions of household heads on food sufficiency were measured by asking household heads whether in the past 30 days prior to the survey there was sufficient quality and sufficient quantity of food to meet the daily requirements of all household members- (*Yes/No response*) and with further probing to explain why they think so.

Food avoidance due to taboo related issues whether there is any food taboo related issues within the community- (*Yes/No response*).

Source of food eaten was categorized as those eaten at *home* and *outside the home* (*street vendors, chop bar, fast food joints and restaurant*). These were considered as two separate predictor variables. For each source, the mean number of times food consumed was computed for the various food groups and later entered in the model as continuous predictor of dietary diversity.

### **1.8.4.4 Food utilization**

The study's response variable (dietary diversity) was measured using Household dietary diversity scores (HDDS) of ranging between 0 and 9 generated from the number of times the nine different standardized food groups considered in this study was consumed in the seven days period preceding the survey. This is regardless of whether the food was eaten in a home or outside home and includes all meals (breakfast, lunch and supper). This study defines high levels of food utilization as high dietary diversity (HDD scores closer to ten) which is

indicative of being food secure and low levels indicates poor dietary diversity (HDD scores closer to zero) and thus poor food security. The HDDS was entered as a continuous response variable in the model.

### **1.8.5 Statistical analysis**

Statistical analyses were conducted with SPSS for Windows (Version 20.0). Descriptive characteristics of variables were assessed by means or percentage distribution in order to highlight the important differences across all household characteristics. The study also uses Analysis of variances (ANOVA) to compare the differences in mean household dietary diversity between and within groups. Also an Eta value ( $-1 \leq \text{Eta} \leq +1$ ) was used to examine the measure of association between the predictor variables and the response variable.

A linear regression technique was used to investigate the magnitude of association between household characteristics such as household size, household food expenditures, age and sex of the household heads and other socio-economic status such as educational level of household heads and dietary diversity as an indicator of household food security. The HDDS was a continuous score ranging between 0 and 9 used as the response variable and evaluating the risk of different determinants on HDDS while controlling for confounders such as cultural factors (food taboos), location of households, social support networks, and food access, source of the food, age of household head, educational levels of household head, and wealth status of the household. Interpretation of results were based on the standardized coefficient of beta ( $\pm\beta$ ) which represents the unit change (e.g. (-ve) reduction or (+ve) increase) in the HDDS as a result of a change in the predictor variables (household characteristics) at 0.05 level of significance while controlling for the effects of age of household heads, sex of household heads, educational level of household heads, ethnic groups, religious affiliation of household heads and locality (location of households).

## **1.9 Ethical considerations**

The survey received ethical approval from the Noguchi Memorial Institute for Medical Research (NMIMR) IRB<sup>17</sup>. All participants signed informed consent and were assured that all information would be treated confidentially and their participation was voluntary.

## **1.10 Limitation of the study**

Rarely does one study exhaustively provide all information about a subject and this as well is a potential pitfall in this study. This survey like in any other survey was affected by sampling and non-sampling errors. The analysis is handicapped by lack of data on standard food security measure and interpretation of results was done with some caution. The crucial influence of urban household demographic and socio-economic characteristics on food utilization can hardly be overstressed. The relationships should not therefore be considered causal but rather associations.

The study uses the physical consumption of household heads to portray an habitual consumption of other household members which may not be a true reflection of individual household members. However, it provides useful information on what households are most likely to consume given that household heads are the ones who provide for other household members.

Seasonality is always an issue for Dietary Diversity (DD) assessment due to the seasonal availability of certain foods. For comparative purposes in this study scores or indices was collected at the end of the year December, 2011 which may present a different situation as compared to another periods of the year such as the hamattan season.

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<sup>17</sup> IRB (Institutional Review Board)

With regards to the indicator, DDS based on last seven days recall, either at the household or individual level, are proxies for habitual diet. They give a valid picture of the dietary diversity at the community level only. No individual or household targeting can be done based on these scores.

Unlike this study, a lot of the research work on DD indicators has been done in stable situations and in rural settings. However, the food consumption score has been mainly applied in emergency and crisis-prone contexts and its usefulness for food security analysis has been ascertained specifically in the urban context.

Notwithstanding the above limitations, results from the analysis can still provide useful information for evaluating food security situation and as a predictor of health outcomes such as risk of chronic non-communicable diseases, obesity and guide for further research.

### **1.11 Definitions of terms and concepts**

**Food system:** The dynamic interactions between and within the biogeophysical and human environments leading to the production, processing, distribution, and consumption of food (Gregory et al., 2005).

**Food security:** Exist when “all people, at all times, have physical and economic access to sufficient, safe, and nutritious food to meet their daily dietary needs and food preferences for an active and healthy life” (FAO, 1996).

**Food access:** The ability to acquire sufficient quality and quantities of food to meet all nutritional requirements of the members of the household (Codjoe and Owusu, 2011).

**Food utilization:** Individual or household biological capacity to consume and benefit from food for a healthy life (FANTA, 2008; FAO, 2008).

**Dietary diversity:** The number of unique food groups consumed by an individual or household over a given reference period usually 24 hours or seven days recall period preceding the survey in order to minimize recall biases (FAO, 2011; Kennedy et al. 2010; Hodinott and Yohannes, 2002; and FANTA, 2002). With reference to this study, the latter recall period was used.

## CHAPTER TWO

### HOUSEHOLD DEMOGRAPHIC AND SOCIO-ECONOMIC CHARACTERISTICS

#### 2.0 Introduction

This chapter describes and explains household characteristics and frequency of food consumptions using mean and percentage distribution with respect to characteristics of household heads.

#### 2.1 Descriptive characteristics of households

##### 2.1.1 Demographic characteristics

###### 2.1.1.1 Age of the household heads

Results indicate that for all households, the mean age of household heads was 36.2 years old. A relatively larger proportion of household heads were between 30-39 years of age accounting for 34.3 percent of the total number, followed by those in their forties (30.1 percent) and the least proportion was those under 20 years (1.1 percent). Adetunji (1998a) defines age as the biological and social maturity as well preparedness of an individual for responsibilities for instance providing for family members.

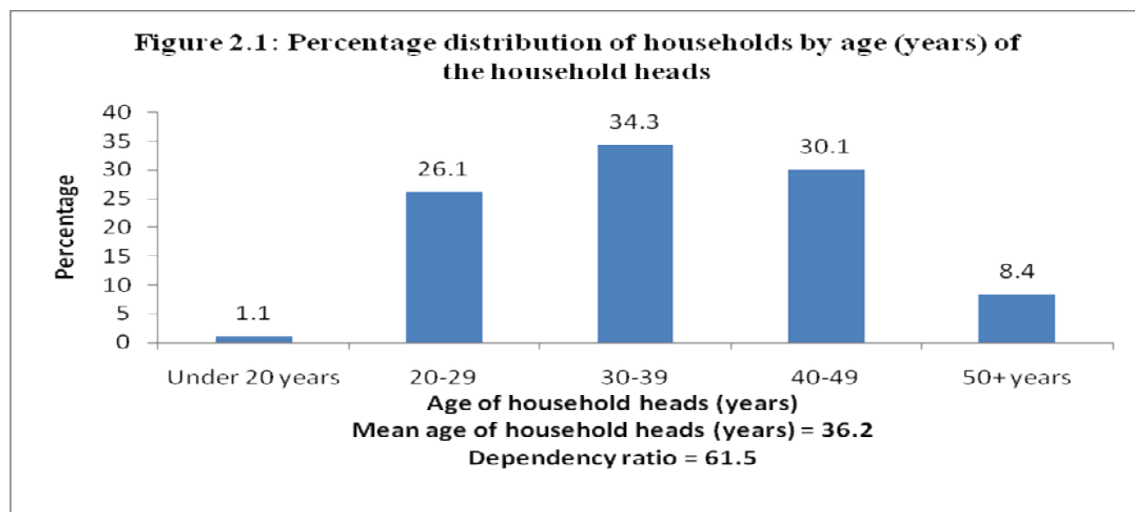
The overall dependency ratio<sup>18</sup> was 61.5 slightly lower than the national average of 82 (GLSS5, 2008), which is an indication that there are about six “dependants” (household members under the age of 15 and 65 years and above) for every 10 people of economically productive age (15-64 years) with significant variations across the three communities from which the sample was drawn. For households in Ussher Town, the ratio was relatively larger— nearly 64.7 percent —while for Agbogbloshie, slightly more than half (54.9 percent)

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<sup>18</sup> Dependency ratio is defined as the number of household members between 0 and 14 years and over 65 years divided by the number of household members of economically productive age 15 and 64 years.

of the household members were dependants (Table not presented). This demographic characteristic has important implications for meeting the basic needs such as food and health particularly in female-headed households, which may limit their economic potential and increase their vulnerability to food insecurity leading to nutritional inadequacy and limited dietary diversity.

Figures 2.1 and 2.2 provide the basic demographic characteristics of the households in the survey sample such as age and sex of household heads respectively.



Source: EDULINK/AARC data (2011)

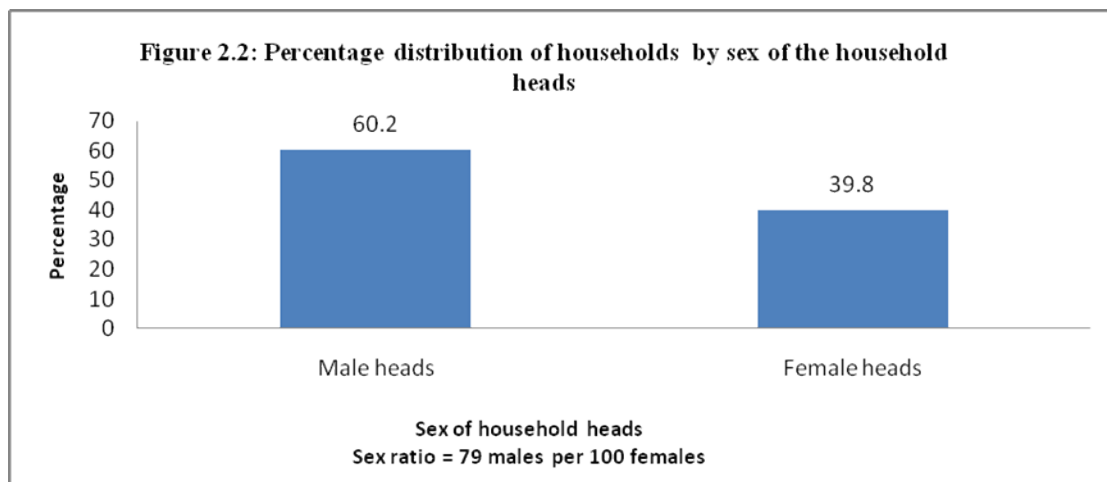
#### 2.1.1.2 Sex of the household heads

Results indicate that out of 452 households in the sample survey, 60.2 percent were male headed compared to 39.8 percent female headed. This resonates with findings by Maxwell et al. (2000), which found that in the Accra community, households headed by males are on average larger than households headed by females. However, this is inconsistent with figures for the whole city of Accra as found in the Women Health Survey of Accra (WHS<sup>19</sup>-II, 2009) which indicate 54.02 percent of female headed households, but rather was consistent

<sup>19</sup> The Women's Health Study of Accra (WHS<sup>19</sup>-II), Douptcheva et al. (2011), Final report on the Women's health study of Accra, Wave II. Accra: Institute for Statistics, Social and Economic Research, University of Ghana

with the GLSS5<sup>20</sup> (2008) which indicated 35.1 percent for urban areas outside Accra and 28.1 percent of female-headed households in Accra as against the national average of 34 percent of female headed households (GSS, 2008).

Levin et al. (1999) alluded to the fact that households headed by females are more disadvantaged than male-headed households because of the difference in access to income, educational levels, better employments, conflicting roles in the household such as childcare and work etc. The sex distribution of household members presented in Figure 2.2 gives an overall sex ratio<sup>21</sup> of 79 males to 100 females compared to national average of 94 males per 100 females (GLSS5, 2008). This implies that for every 100 females living in all households in the sample selected, there were 79 males. The relative absence of males in the households sampled is a result of the sample selection strategy and the unique structure of Ga households. Codjoe and Owusu (2011) demonstrate the significance of having a larger proportion of male in a household when it comes to access of food and resources.



Source: EDULINK/AARC (2011)

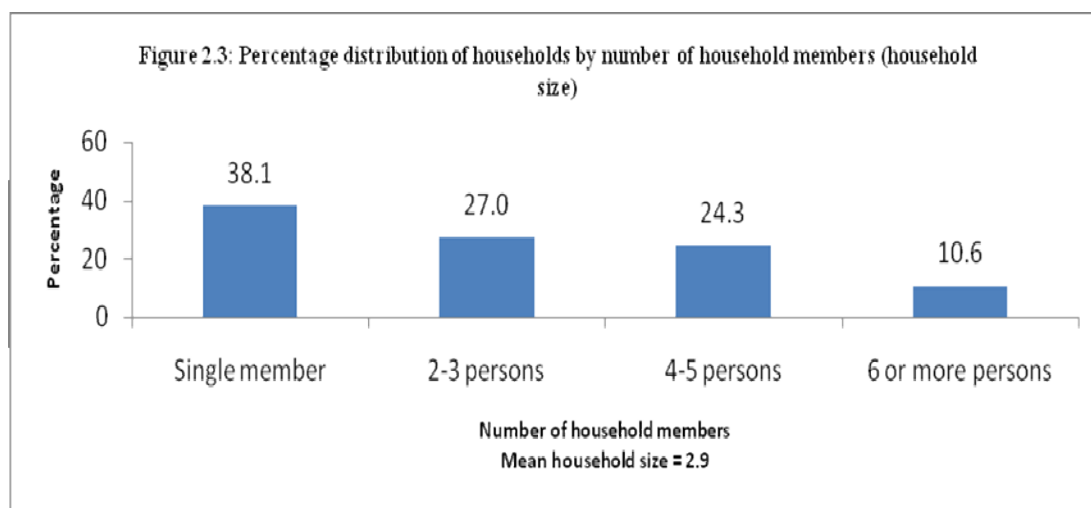
## 2.1.2 Socio-economic characteristics

### 2.1.2.1 Number of persons in a household (household size)

<sup>20</sup> Ghana Living Standards Survey, Ghana Statistical services, 2008, Report of the fifth round (GLSS5), September, 2008

<sup>21</sup> Sex ratio is defined as the number of males per 100 females in a given population (sample).

Results in Figure 2.3 indicate that the overall mean household size was 2.9 persons with a minimum of one and a maximum of fifteen household members compared to the 3.3 for Greater Accra Metropolitan Area (GAMA) as reported in GLSS5 (2008) also slightly less than Ghana's urban household size of 3.5 persons. This implies that for every household in the sample, there was an average of three persons living in these households. Data indicate a relatively larger proportion of approximately 38.1 percent of the household heads in the sample survey as single members compared to 4.7 percent for the whole city (WHSI-II, 2009) whereas the least proportion were those with six or more household members which has 10.6 percent of the total households. The proportion of households reduces as household size increases. This may have implications on food utilization, for instance, Anarfi and Ahiadeke (2006) propounded that increasing household size means “more mouth to feed”, more expenditures on food, and thus dietary inadequacy for household members.

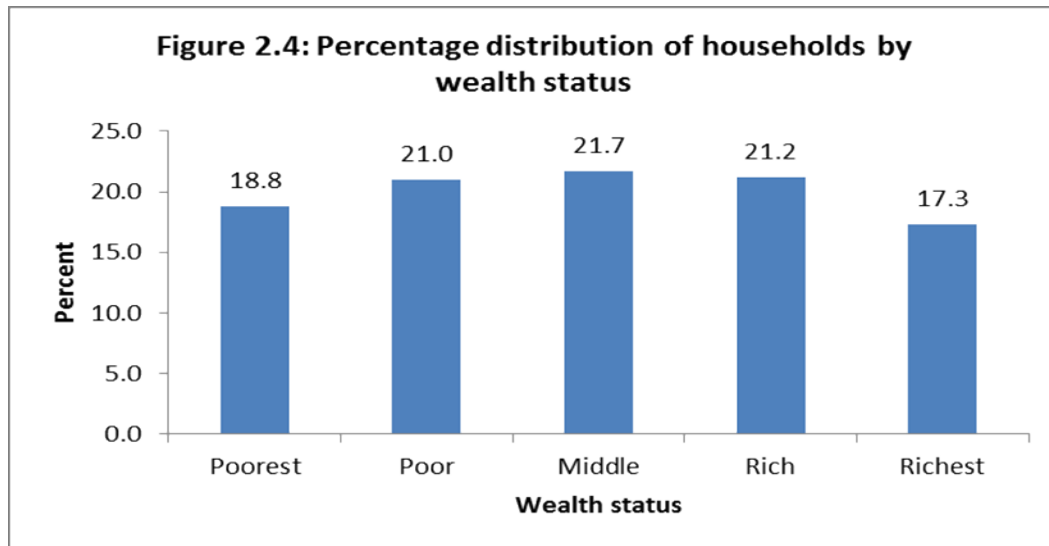


Source: EDULINK/AARC data (2011)

### 2.1.2.2 Household wealth status

On the aggregate slightly more one-third (39.8 percent) of the households was in the poor and the poorest quintiles, with no significant variations between summation of the rich and richest

class (38.5 percent). Also, only about one-quarter (21.7 percent) of the households were in the middle class. On the overall, there are no significant differences in the proportion of poor, middle, and rich quintiles ranging about 21 percent. This may explain the difference in purchasing power of households and access to other resources that may improve food utilization.

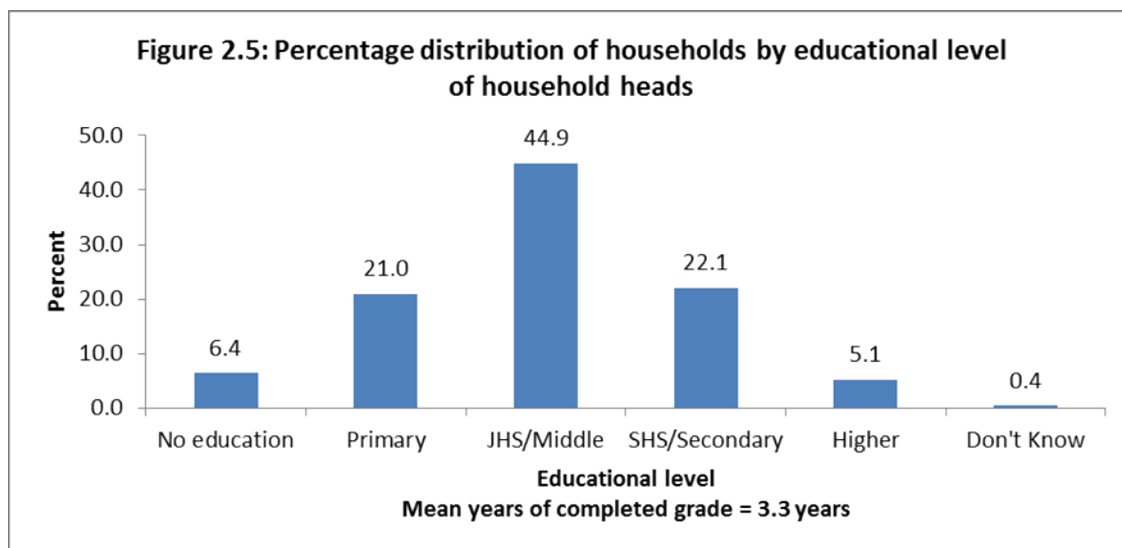


Source: EDULINK/AARC data (2011)

### 2.1.2.3 Educational level of household heads

With regards to educational level of household heads, results indicate that approximately 44.9 percent of the household heads had attained JHS/Middle school. There was no significant difference between those who had attained at least primary and SHS/secondary education (21.0 and 22.1 percent respectively). Only 5.1 percent of household heads had higher education levels. High educational level of household heads is associated with better employment opportunity and higher incomes and may translate into higher purchasing power and better nutrition knowledge for all household members through improving dietary diversity (Hoddinott and Yohannes, 2002). Results further indicate that on the overall, household heads in the sample survey completed an average of 3.3 years of their education grades. The utility of examining the number of years completed in their grades is useful to understand the

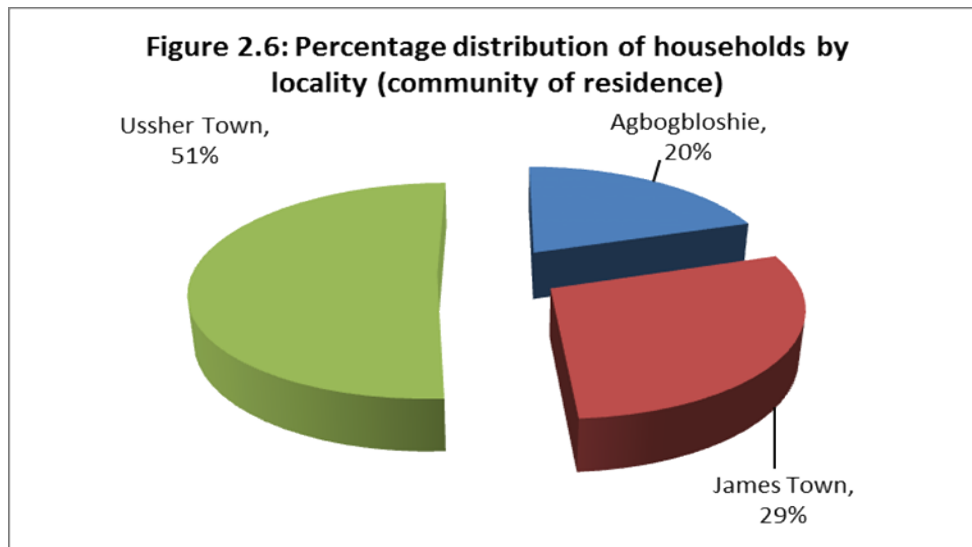
influence of the level of education on nutritional knowledge, which may influence household expenditure and dietary patterns.



Source: EDULINK/AARC data (2011)

#### 2.1.2.4 Locality

For all households selected, a relatively larger proportion of the households lived in Ussher Town accounting for slightly more than half (51 percent) followed by James Town (29 percent) and Agboghloshie accounting for only about one-fifth (20 percent) of the total number of households. The location of the households in this study is useful in examining the composition and nature of inhabitants in terms of cultural diversity, social and economic lifestyle and migrant settlement areas which may have tremendous influence on household dietary patterns (Anarfi and Ahiadeke, 2006). For instance, although considered as an indigenous settlement area, Agboghloshie has more migrant population than Ussher Town and James Town, which has more indigenous population, and their proximity to sources of food such as markets and the sea.



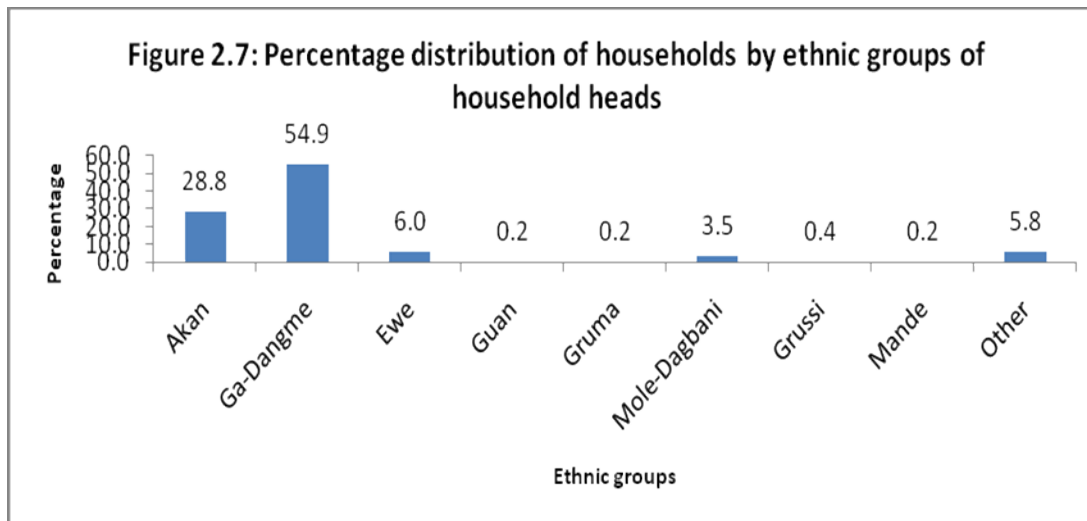
Source: EDULINK/AARC data (2011)

### 2.1.2.5 Ethnic groups of household heads

For all households randomly selected, a majority of household heads were Ga-Dangme accounting for 54.9 percent followed by Akan (28.8 percent), whereas the remaining 16.3 percent were from other ethnic groups such as Ewe, Mole-Dagbani, Grussi, Guan, Gruma, Mande and others. This is contrary to the national representation which indicates Akan as the largest ethnic group (GSS, 2008). This may be attributed to the fact that Accra is a cosmopolitan and an indigenous Ga habitat. The role of ethnic groups is useful as a proxy in understanding cultural diversity, differences in proportion of most educated ethnic population which has influence on households' food consumption patterns (see example in Codjoe and Owusu, 2011; de-Graft Aikins, 2011 and Badasu, 2004).

For instance, Codjoe and Owusu (2011) in the Afram plains of Ghana found that pregnant Ewe women are abhorred from eating okro, snails and ripe plantain since it may cause miscarriage. This also resonates with findings by Badasu (2004) among Ewe migrants in Accra and Songsore and Denkabe (1995) among the Dagaare of northern Ghana where eating baobab leaves is forbidden by pregnant women, and also fear of giving protein products such as eggs and meat to children since it may instigate them to steal (Nabigne, 2004). All these

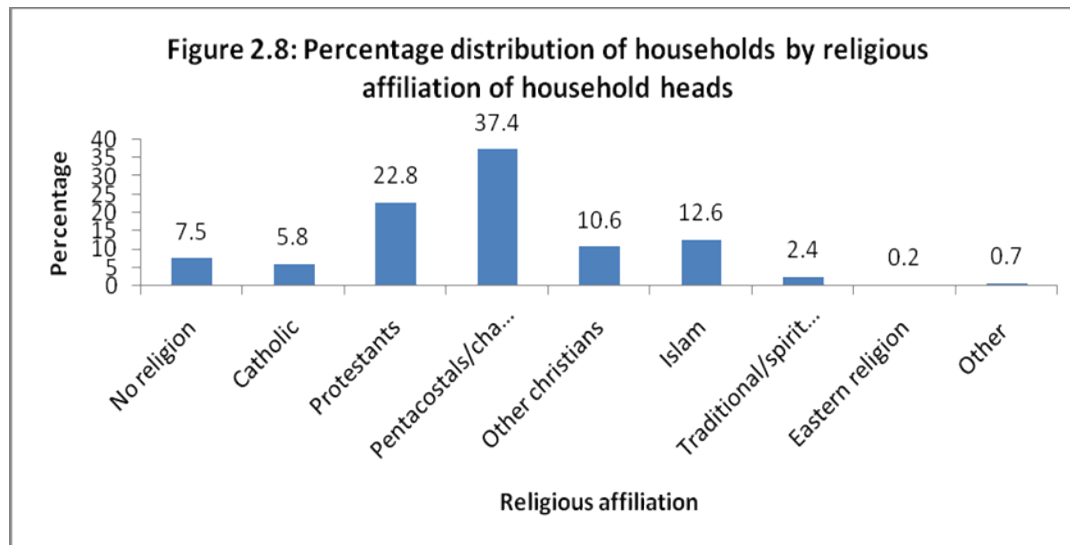
may have consequences for limiting food variety of household members. In addition, it allows for examination of the main staple based foods or native foods which may tremendously affect food consumption pattern for instance kenkey for the Ga, Akple for the Ewe and fufu for the Akan.



Source: EDULINK/AARC data (2011)

#### 2.1.2.6 Religious affiliation of household heads

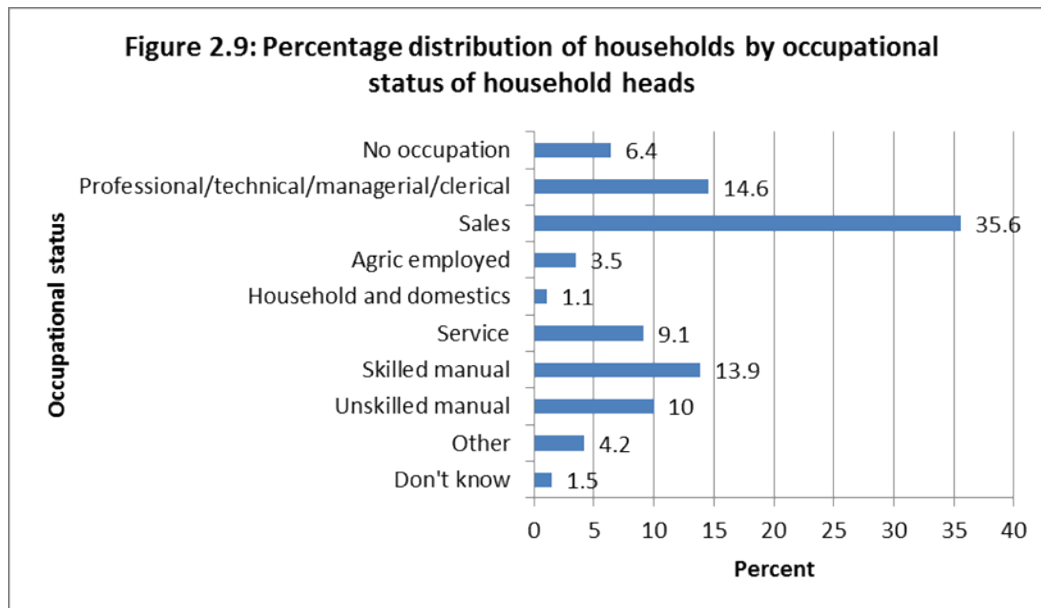
Results in Figure 2.8 indicate that more than one-third (37.4 percent) of household heads were Pentecostals/charismatic, about one-fifth (22.8 percent) were protestants, 12.6 percent Islam and about 7.5 percent had no religion. Religious doctrines are significant in examining what is considered consumable foods and non-consumables. For instance, Moslems do not eat pork, olive oil are only used for religious purposes even when such food groups are nutritious for a healthy living.



Source: EDULINK/AARC data (2011)

### 2.1.2.7 Occupational status of household heads

With regards to occupational status, a relatively larger proportion (35.6 percent) of household heads was involved in sales. There was no significant variation between those employed in skilled manual jobs and those in the professional/technical/managerial or clerical works (13.9 and 14.6 percent). Conversely, 10 percent of the household heads were involved in unskilled manual jobs; about 6.4 percent were not working at the time of the survey which is not different from the urban unemployment rate of 6.3 percent compared to 8.9 percent in Accra (GLSS5, 2008). The kind of work household heads are engaged determines the incomes, access to resources and other social services and access to food in terms of affordability (Levin et al. 1999 and Maxwell et al. 2000).



Source: EDULINK/AARC data (2011)

### 2.1.3 Food access and utilization

#### 2.1.3.1 Household perceptions on food access and food avoidance due to taboo

Household heads were asked whether there was sufficient quality and quantity of food necessary to meet the daily needs for all its members in the last 30 days preceding the survey or if there was any food taboo in the community that would forbid them from eating certain kinds of foods. For all households in the sample survey, slightly more than one-third (35 percent) perceived their households not to have sufficient quantity of food that would meet the requirements of all members. Also, 29.2 percent perceived their households not to be having sufficient quality of food for all household members. A negligible 0.4 percent knew of food taboo related issues within the community while a proportionate 23.5 percent did not know of any food taboo. Among some of the food, taboos reported were; snails and crabs (a respondent from Benin), electric fish, dogs and tortoise (turtles) were a clan totem, pork was forbidden by Muslims among others but a few to mention.

**Table 2.1:** Proportion of households who reported on their perceptions about sufficient quality and quantity of foods for their household members in the last 30 days and knowledge of foods taboo in the community

	Perceptions of household heads					
	Sufficient Quantity		Sufficient Quality		Food avoidance due to taboos	
Response	Percent	Number	Percent	Number	Percent	Number
Yes	64.6	292	67.0	303	0.4	2
No	35.0	158	29.2	132	76.1	344
Don't know	0.4	2	3.8	17	23.5	106
<b>Total</b>	<b>100</b>	<b>452</b>	<b>100</b>	<b>452</b>	<b>100</b>	<b>452</b>

Source: EDULINK/AARC data (2011)

#### 2.1.4 Household food consumption and source of food

Evidence in Table 2.2 below indicate that for all households in the sample survey, the mean household dietary diversity (HDD) was 6.8, which suggests that on average every household heads consumed at least above six different food groups in the seven days period preceding the survey based on the categorization in Kennedy et al. (2010). Results further indicate that, most of these food groups were consumed outside the home compared to those eaten at home as indicated by the mean HDDS of 5.0 and 4.3 respectively. For specific food groups, even though more food groups were consumed outside the home than at home, the average number of times (frequency) foods were consumed at home seems to suggest a relatively higher frequency of consumption than those outside the home. This may be due in part to that fact that similar meal (meal of one kind) at home may be served for several meal times before fresh one is prepared whereas one may be faced with varieties of foods outside the home but only limited by his ability to pay for the foods (budget). Thus one tends to eat more frequently from home with few varieties and less frequently outside home with more varieties. However, these may not necessarily mean that food eaten outside home is good. The hygiene environments in which they are prepared and sold is highly associated with gastrointestinal bacterial infections more than homemade foods (see Mensah et al. 1995; WHO, 2002). Results indicate that overall household heads consumed these food groups at least 3.5 and 3.4

times respectively and about eight out nine food groups were eaten less than once at home. A possible explanation could be because foods like kenkey, banku and akple are considered as staple foods which are usually accompanied by vegetables or animal/poultry products prepared as stews, soups or sauces and are relatively cheaper than other food groups. Conversely, consumption of foods rich in micro-nutrient was relatively low such as fruits and milk/dairy products. The low consumption rate for foods rich in micro-nutrient such as vitamins and iron compared to other food groups is due to low productivity which leads to high prices attached to such commodities (GSGDA, 2010 and Mwaniki, 2003), lack of nutrition knowledge and social factors such as taste and preference (de-Graft Aikins, 2011).

**Table 2.2:** Mean number of times food groups was consumed at various sources by household heads in the seven days period preceding the survey.

Food groups	Eaten at Home	Eaten Outside <sup>22</sup> home	All
	Cereal-based and grain products (porridges and staples)	2.2	1.2
Starchy roots/tuber and Plantain based staples	1.1	0.2	1.3
Fats and Oils	1.1	0.2	1.3
Meat/Fish/Eggs/poultry	1.7	0.9	2.6
Processed foods (baked/roasted/boiled/fried snacks) <sup>23</sup>	1.8	0.5	2.4
Soft drinks/sweets/sugar	0.9	0.3	1.2
Milk and dairy products <sup>24</sup>	0.6	0.1	0.7
Fruits <sup>25</sup>	1.6	0.7	2.2
Vegetables (cooked and raw) <sup>26</sup>	3.2	0.9	3.8
<b>Mean Household dietary diversity score (HDDS)</b>	<b>4.3</b>	<b>5.0</b>	<b>6.8</b>
<b>Total number of households</b>			<b>452</b>

Source: EDULINK/AARC data (2011)

### 2.1.5 Household support network and transfers

In practice, households with an extra source of support network and transfers (social capital) are better off than those without any since their provisions are supplemented by these supports

<sup>22</sup> Outside home include; street vendor, chop bar, fast food joint and restaurant

<sup>23</sup> Bran/wheat bread, sugar/tea/butter bread, meat pie, cakes, doughnut, koose, etc

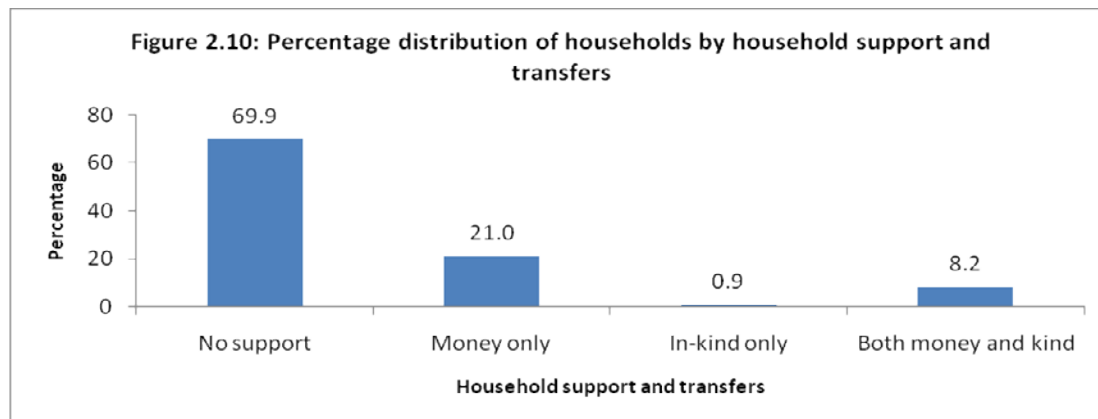
<sup>24</sup> Milk, yoghurt/fanmilk, cheese/wagashie, etc

<sup>25</sup> Orange, Pineapple, banana, pawpaw, watermelon, mango, apples, grapes, avocado pear, coconut, etc

<sup>26</sup> Green leafy vegetables (e.g kontomire, aleefu, ayoyo), cabbage, carrots, egg plant, okro, tomatoes, onion, etc. These include both cooked (stews, soups and sauces) and raw (salads).

received. This study considers support as financial and in-kind received in the last 30 days prior to the survey from relatives, friends, and neighbours who do not live with the households within the reference time.

Overall, 69.9 percent of all households did not receive any form of financial or in-kind support within the reference period. Out of the 30.1 percent who received, 21.0 percent was in the form of money only, while 8.2 percent received both money and in-kind. Migrant households find cross-sharing complicated in towns (Levin et al. 1999). People do not share food and exchange gifts; they do everything with expectations of being repaid. Friends, neighbours, and relatives are good source of this kind of source of income, which helps to supplement their incomes to facilitate purchase of food items for household members.



Source: EDULINK/AARC data (2011)

### 2.1.6 Household food expenditure

Table 2.3 shows the share of household monthly expenditure in cash or in-kind on food in the last 30 days. Amount was calculated based on the currency conversion rate at the time of survey (1.00 USD=1.57 New Ghana cedi (GH¢)). The foods were to include such things as rice, meat, fruits, vegetables and cooking oils. Including all foods produced and consumed by the household, and exclude alcohol and tobacco. The proportion of monthly spending on food

was computed from the amount spent on food as a percentage of the overall expenditure (food and non-food items) in the last 30 days preceding the survey.

Households who spend a huge proportion of their income on food are the low-income groups as seen in the table above. This may not necessarily mean they are food secured as they have to spend a huge percentage of their income in order to buy enough which may not be sufficient, given the high food prices in the urban market. It is interesting to note that about 13.1 percent of the household heads had no expenditure on food in the last 30 days prior to the survey. This could be attributed to the fact that they depend on the food prepared to be vended or sold, some are fishermen who depend mainly on fish catch, and some households during the field work reported that they do farming in the Northern region and so, they depend on the harvest. Results show that a relatively larger proportion of households, approximately 37.6 percent spent between 50-79 percent of their total monthly expenditure on food with an average amount of 162 cedi fifty one pesewa. Approximately one-quarter (25.9) percent spent between 20-49 percent of their monthly budget with an average amount of 120 cedi eighty eight pesewa of their monthly budget on food. Increase in household spending on food is associated with higher dietary diversity (Kennedy, 2004). Overall, more than half (54.4 percent) of the households spent more than half (above 50 percent) of their total monthly expenditure on food purchase suggesting relatively higher risk of food insecurity. Also overall, households spent approximately 572 cedi eight pesewa of the monthly budget on food in the last 30 days prior to the survey.

**Table 2.3:** Percentage distribution of households by proportion of total monthly expenditure on food (share of expenditure on food) in the last 30 days prior to the survey

Proportion of household expenditure on food	Percent	Mean Cedi	
		(GH¢)	Number
No expenditure	13.1	00.00	51
1-19 percent	5.3	1278.54	32
20-49 percent	25.9	120.88	117
50-79 percent	37.6	162.51	170
80+ percent	16.8	161.76	76
Missing	1.3	-	6
<b>TOTAL</b>	<b>100</b>	<b>GH¢ 572.08</b>	<b>452</b>
<b>Mean (%) household expenditure on food</b>	<b>50.0</b>		

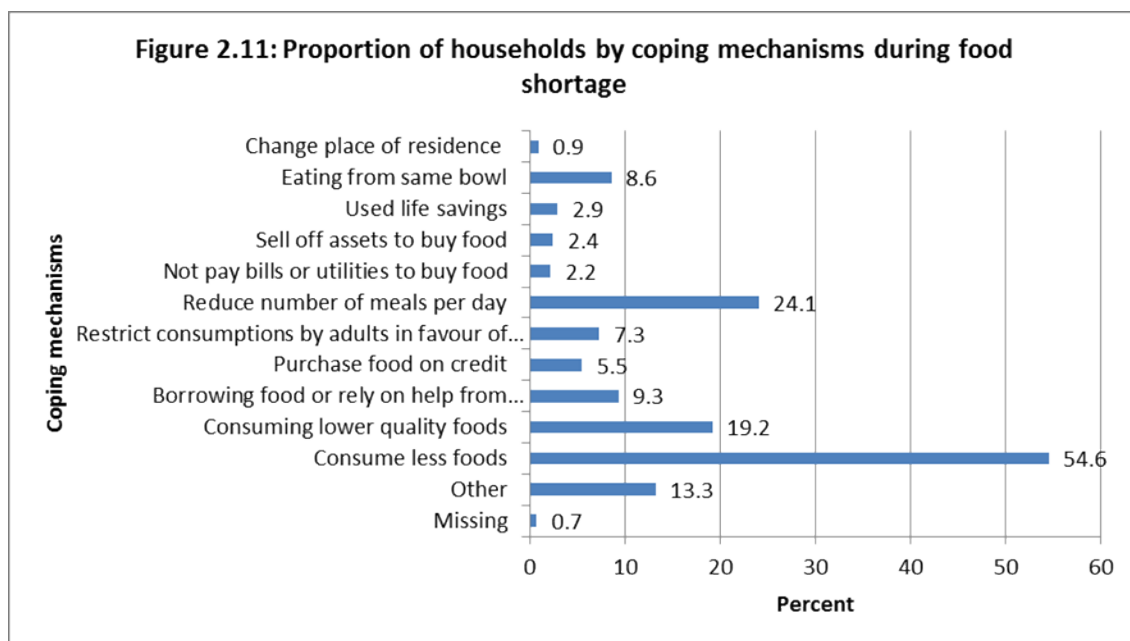
Source: EDULINK/AARC data (2011)

## 2.2 Household coping mechanisms to food shortage

Figure 2.11 shows household coping mechanisms to food shortage included; consuming less foods, consuming lower quality food, borrow food or rely on help from friends or relatives, purchase food on credit, restrict consumptions by adults in favour of children, reduce number of meals per day, not pay bills or utilities to buy food, sell off assets to buy food, used life savings, eating from the same bowl, change of place of residence and other.

In the absence of formal food safety nets, households adopted myriad strategies to minimize the shocks on household food security. Results indicate that for all households who responded to these multiple response choice questions on household coping mechanisms to food shortage, more than half (54.6 percent) reported that they usually consumed less food followed by nearly one-quarter (24.1 percent) who responded that they normally reduce the number of meals per day. Also, 19.2 percent and 8.6 percent reported that they would consume lower quality food and eat from the same bowl respectively, so as to cater for the next day. Distress sale of household assets, forfeiting payment of utility bills to cope with food inadequacy was not so common among households in the study.

Quite a significant proportion of the households (13.3 percent) reported Other options as was specified in the open ended questions such as alternating for cheaper foods, do not eat but rather sleep on empty stomach, some reported that they would do nothing, drink tea or water and wait for the next day and statements such as “*I pray to God and he helps me,*” connotes divine intervention and while others said they can manage with the little they have. However, for those who perceive not to lack what to eat reported that food is always available and therefore, they often get enough of what to eat or at worse buy from chop bars or street vendors, and some reported that because they can afford what they want to eat. Finally, some stated that they would have liked to have different types of food, suggesting that these households were choosing food types for budgetary reasons.



Source: EDULINK/AARC (2011)

## CHAPTER THREE

### HOUSEHOLD CHARACTERISTICS AND DIETARY DIVERSITY

#### 3.0 Introduction

This chapter presents the bivariate relationship between household characteristics, household support network and transfers, household perceptions on food sufficiency and the mean number of times food groups consumed by household heads. Also considered in these tables is the mean number of unique food groups households consumed in the seven days period prior to the survey. This study considered all foods consumed at home or outside the home irrespective of the source of the food in the last seven days preceding the survey.

#### 3.1 Frequency of foods consumed by household demographic characteristics

In order to compare the variation in the mean consumption of the nine different food groups, an ANOVA<sup>27</sup> was used to test for significant variations at 0.05<sup>28</sup> confident levels between and within predictor variables. Age of household heads showed very strong significant variation with mean number of times various food groups were consumed in the seven days period prior to the survey. Also an Eta<sup>29</sup> value of 0.563 as a measure of association suggest that the age of household heads as a predictor variable can explain 56.3 percent of the variations in the mean number of times various food groups was consumed within the reference period. Household heads in their thirties consumed relatively more unique food groups than those fifty years and above as indicated by the mean HDDS (7.2 compared to 6.4 respectively). The possible explanation could be that age of the household heads may determine differences in

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<sup>27</sup> ANOVA-Analysis of variance for testing significant associations between and within predictor variables

<sup>28</sup> P-value 0.05 confident levels (95%)

<sup>29</sup> Eta-Measure of association (the closer the Eta value is to zero the weaker the association and the closer it is to +1 or -1, the stronger the association)

access to income, age also influences expenditure pattern and dietary taste and preference in the household and also preparedness to take up responsibilities such as providing for the household (Nakabo-Ssewanyana, 2003).

With respect to frequency of consumption, results indicate that on average household heads in their thirties (30-39 years) consumed more than half of the food groups more than 3 times in the seven days period followed by household heads under the age of 30 years as much as that consumed by household heads 50 years and above. There was a sharp decline in the frequency of food consumed among heads of house in their forties (40-49 years old) and above fifties (50+years old). Specifically, results show relatively higher average consumption of cereals based staples and vegetables which were mainly cooked stews or soups. In addition, consumption of vegetables and fruits is relatively higher for heads in their thirties as these are the most economically active age group and thus have the ability to purchase these food items perceived as relatively expensive compared to other food items. Older heads of household are perceived to be biologically and socially prepared to take up responsibilities such as provision of basic needs for its members compared to younger household heads. The findings corroborate that of Nakabo-Sserwanyana (2003), which suggests that the age of household heads may determine differences in access to economic opportunities which may influence the expenditure pattern of a household and their dietary taste and preference.

Table 3.1 shows the mean number of times various food groups was consumed and the mean HDDS (number of unique food groups consumed) in the last seven days prior to the survey by age of household heads

Age of the household heads (years)	Cereals		Fats/ Oils	Meat/ Fish/ Egg	Baked/ Boiled/ Fried		Milk/ Dairy products	Fruits	Vegetables	Mean HDDS	Number
	Based Staples	Tuber/ roots			snacks	Soft drinks					
Under 30 years	3.3	1.1	1.2	2.5	2.2	1.1	0.9	2.1	3.4	6.9	123
30-39	5.3	2.2	2.2	3.9	4.3	2.1	1.6	4.4	6.1	7.2	154
40-49	1.8	0.6	0.5	1.4	0.8	0.3	0.2	0.2	1.9	6.7	136
50+ years	1.9	0.6	0.5	1.4	0.7	0.3	0.3	0.1	2.1	6.4	38
<b>Total</b>	<b>3.4</b>	<b>1.3</b>	<b>1.3</b>	<b>2.6</b>	<b>2.4</b>	<b>1.2</b>	<b>0.7</b>	<b>2.2</b>	<b>3.8</b>	<b>6.8</b>	<b>451</b>

Source: EDULINK/AARC data (2011)

Evidence in Table 3.2 male-heads of households consumed more unique food groups than female-heads (7.5 compared to 6.8 respectively-see mean HDDS as in Table 3.2). The major differences in the consumption patterns by sex of the household heads could be attributed to differences in access to income, educational levels, and household organization on the allocation of resources, occupation and access to food with male-heads standing at an advantage (Codjoe and Owusu, 2011 and Levin et al. 1999). With regards to frequency of consumption results seem to suggest that female-heads of household had higher frequency of consumption than male-heads but consumption is limited to only specific variety. This could be due to the fact that most of the female-heads are involved in petty trade especially in food vending, owned or operated chop bars (food joints) where they consume from their own sales.

Also, interesting to note as indicated in the result, is that the pattern of consumption seems to concentrate on a common food groups by the different sex of the household heads. For instance, cereals (3.4 times), meat/fish/eggs (2.6 times) and vegetables (3.8 times) were the most commonly eaten food groups and milk products were consumed less than once because it is relatively an expensive food item. A possible explanation could be that most of the cereal foods are accompanied by vegetables or animal/ poultry products in the form of stews or soups. The F-test indicated that there was no significant variations between sex of the

household heads and the mean number of times various food groups was consumed with an Eta value of less than 10 percent. As earlier stated in the methodology section, the consumption of one food group many times is not sufficient for dietary diversity but rather the consumption of more than one unique food groups (Kennedy et al. 2010 and FAO, 2011).

**Table 3.2:** Mean number of times various food groups were consumed and the mean HDDS (number of unique food groups consumed) in the seven days period prior to the survey by sex of household heads

Sex of Household Heads	Food Groups									Mean HDDS	
	Cereals Based Staples	Tuber/ roots	Fats/ Oils	Meat/ Fish/ Eggs	Baked/ Boiled/ Fried snacks	Soft drinks	Milk/ Dairy Products	Fruits	Vegetables	HDDS	Number
Male heads	3.2	1.2	1.1	2.4	2.1	1.0	0.7	1.8	3.4	7.5	274
Female heads	3.8	1.5	1.4	2.8	2.8	1.3	0.9	2.7	4.3	6.8	177
<b>Total</b>	<b>3.4</b>	<b>1.3</b>	<b>1.3</b>	<b>2.6</b>	<b>2.4</b>	<b>1.2</b>	<b>0.7</b>	<b>2.2</b>	<b>3.8</b>	<b>6.8</b>	<b>451</b>

Source: EDULINK/AARC data (2011)

### 3.2 Frequency of foods consumed by household socio-economic characteristics

Based on the mean HDDS as presented in Table 3.3, results indicate that single household members consumed seven unique food groups compared to households with six or more persons (mean HDDS=6.4). The result corroborate the logical explanations provided by Anarfi and Ahiadeke (2006) that increasing household size means more mouths to feed, increased expenditure on food and thus reduced levels of consumptions either on quantity, quality and less variety of foods constrained by budget. ANOVA results indicated that there was no significant variation at  $p\text{-value} < 0.05$  between household size and the mean number of times various food groups were consumed by household heads.

Also, single household members and 2-3 household members averagely consumed nearly each of the nine food groups in the seven days period three times as much as that consumed by households with six or more persons. Also, single household members consumed at least seven unique food groups more than households with two or more household members. However, most of the food groups consumed are energy dense food (cereal based staples)

which is usually accompanied by vegetables or animal/poultry products prepared as stews, soups or sauces. Six or more member households on average consumed each food group less than once within the same period as those consumed by single member households.

**Table 3.3:** Mean number of times various food groups was consumed and the mean HDDS (number of unique food groups consumed) in the last seven days preceding the survey by number of persons living in a household

Household size	Cereals	Tuber/	Fats/	Meat/	Baked/	Soft	Milk/	Fruits	Vegetables	Mean	Number
	Based	Roots	Oils	Fish/	Boiled/	drinks	Diary				
	staples			Eggs	Fried		Products			HDDS	
Single member	3.9	1.6	1.5	2.9	2.9	1.4	1.0	2.7	4.4	7.0	172
2-3 persons	4.6	1.9	1.8	3.2	3.7	1.7	1.1	3.7	5.2	6.8	121
4-5 persons	1.8	0.6	0.5	1.7	0.6	0.4	0.2	0.3	1.9	6.9	110
6 or more persons	1.9	0.5	0.5	1.5	0.9	0.4	0.2	0.1	1.8	6.4	48
<b>Total</b>	<b>3.4</b>	<b>1.3</b>	<b>1.3</b>	<b>2.6</b>	<b>2.4</b>	<b>1.2</b>	<b>0.7</b>	<b>2.2</b>	<b>3.8</b>	<b>6.8</b>	<b>451</b>

Source: EDULINK/AARC data (2011)

With regards to household wealth status, even though the pattern in the frequency of food groups consumed by the richest class seem to be relatively lower compared to those in the lower income groups, results show a relatively balanced diet in their food consumption (mean HDDS = 7.4 for the richest compared to 6.4 for the poorest). This could be due differences in levels of organization of resources, assets which can easily be converted into cash that would increase purchasing power, better employment opportunities which put those in higher quintiles at an advantage. Results in Table 3.4 indicate that middle class households consumed on average a relatively higher frequency of food groups consumed compared to those in the lower and upper quintiles because these foods are relatively cheaper usually prepared outside the home. Most commonly eaten food groups were vegetables, cereals, snacks and ASF. For instance, the mean number of times the poorest class consumed ranges between 1.7 times for soft drinks and 5.2 times for vegetables compared to richest with 0.3 times for milk/products and 2.1 for cereal foods. The latter group showed no significant differences in the mean number of times food groups were consumed which is an indication

of balanced diet as indicated by an Eta value of less than 10 percent to explain these associations.

**Table 3.4:** Mean number of times various food groups were consumed and the mean HDDS (number of unique food groups consumed), in the last seven days prior to the survey by household wealth status

Household wealth status	Food Groups									Mean HDDS	
	Cereals Based Staples	Tuber/ Roots	Fats/ Oils	Meat/ Fish/ Egg	Baked/ Boiled/ Fried snacks	Soft drinks	Milk/ Dairy Products	Fruits	Vegetables	HDDS	Number
Poorest	4.6	1.9	1.8	3.3	3.6	1.7	1.1	3.7	5.2	6.4	85
Poor	4.8	2.1	2.0	3.5	4.0	1.9	1.3	3.9	6.3	6.8	95
Middle	5.7	2.5	2.5	4.3	5.3	2.4	1.7	5.6	7.0	7.2	98
Rich	1.9	0.6	0.5	1.6	0.7	0.4	0.2	0.3	1.9	6.6	96
Richest	2.1	0.6	0.5	1.7	0.8	0.4	0.3	0.3	1.7	7.4	77
<b>Total</b>	<b>3.4</b>	<b>1.3</b>	<b>1.3</b>	<b>2.6</b>	<b>2.4</b>	<b>1.2</b>	<b>0.7</b>	<b>2.2</b>	<b>3.8</b>	<b>6.8</b>	<b>451</b>

Source: EDULINK/AARC data (2011)

Education is significant in examining nutritional knowledge which may influence dietary diversity or nutritional quality and feeding habits of household members. Results in Table 3.5 indicate that household heads with higher education consumed more balanced diet/variety food groups (presented by the mean HDDS) than those with no education (7.1 compared to 6.3 respectively) although the variations was not significantly different across all educational levels of household heads. Also, specifically household heads with at least primary education consumed on average the highest frequency of food groups in the seven days period preceding the survey. Most household heads with primary education are those mostly involved in petty trade, food vending, operate food joints who eat from their source of sales. They consumed ranging between 2.5 times of milk products and 7.3 times of cereals. These are indications of monotonous diets. Kennedy (2010) postulates that high consumption of monotonous diets such as energy dense staples are common in food insecure areas. This implies that even though results show a lower frequency of foods consumed by heads with higher education, they spread their consumption across all food groups. The possible explanations to this could be differences in access to nutritional knowledge and resources and higher incomes which determines purchasing power.

**Table 3.5:** Mean number of times various food groups were consumed and the mean HDDS (number of unique food groups consumed) in the last seven days prior to the survey by highest educational level of household heads

Highest educational level of household heads										Mean HDDS	Number
	Cereals Based staples	Tuber/ Roots	Fats/ Oils	Meat/ Fish/ Eggs	Baked/ Boiled/ Fried snacks	Soft drinks	Milk/ Dairy Products	Fruits	Vegetables		
No education	1.8	0.6	0.3	1.6	0.6	0.2	0.1	0.9	1.0	6.3	29
Primary	7.3	3.3	3.1	5.1	6.7	3.0	2.5	6.0	4.4	6.9	94
JHS/Middle	1.9	0.6	0.5	1.5	0.7	0.4	0.3	1.0	0.4	6.8	203
SHS/Secondary	3.6	1.4	1.4	2.8	2.5	1.3	0.9	2.7	2.4	6.8	100
Higher	2.0	0.5	0.5	1.5	0.6	0.4	0.2	1.3	1.0	7.1	23
Don't know	1.6	0.9	0.6	1.1	0.7	0.3	0.1	1.6	1.4	7.0	2
<b>Total</b>	<b>3.4</b>	<b>1.3</b>	<b>1.3</b>	<b>2.6</b>	<b>2.4</b>	<b>1.2</b>	<b>0.7</b>	<b>2.2</b>	<b>3.8</b>	<b>6.8</b>	<b>451</b>

Source: EDULINK/AARC data (2011)

Household food consumption by location of households indicated a marked variation in the average daily number of times different food groups were consumed in the last seven days prior to the survey. Ussher Town and James Town were generally more advantaged than Agbogbloshie in terms of variety of food groups consumed within the reference date (mean HDDS of 6.9 and 6.8 compared to 6.1 respectively) although there were no significant differences across all the three communities. This is attributed to pile of migrant settlers in Agbogbloshie whose livelihood sources are compromised by the high cost of living and also ethnic composition may contribute to cultural differences in dietary behaviour. What may be consumable to a Ga indigene may be abhorred to a migrant or another ethnic group. As expected, households in Ussher Town on average consumed each of the food groups approximately twice as much as households in Agbogbloshie had consumed within the reference period. Households in Agbogbloshie on average consumed less than once of tubers, fats/oils, snacks, soft drinks, milk products and fruits in the last seven day period preceding the survey. This is an indication that, if a household is not able to consume at least more than four food groups in the seven days period such as in Agbogbloshie, then poor dietary diversity is likely to prevail in such households hence an indication of food insecurity. However, daily consumption of foods rich in vitamins and iron such as fruits and milk products were

relatively low presumably due to high market prices associated with these food items and also, taste and preference may vary. Contrary to what the frequency in the daily consumption across all communities indicate that there was no significant variation in the number of unique food groups consumed within the reference period. Possible explanations to this finding could be attributed to the fact that Agbogbloshie has more migrant population compared to households in James Town and Ussher town who are predominantly indigenous occupants. This would mean access to resources, food items, income generating activities may be dicey coupled with the dire need to meet the daily requirement for a descent living among migrant compared to non-migrants.

**Table 3.6:** Mean number of times various food groups were consumed and the mean HDDS (number of food varieties consumed) in the last seven days prior to the survey by household wealth status

Locality (location of households)	Cereals		Fats/ Oils	Meat/ Fish/ Eggs	Baked/ Boiled/ Fried snacks	Soft drinks	Milk/ Diary Products	Fruits	Vegetables	Mean HDDS	
	Based Staples	Tuber/ Roots								Number	
Agbogbloshie	1.9	0.6	0.4	1.5	0.7	0.4	0.3	0.3	1.7	6.1	92
James Town	3.2	1.2	1.2	2.4	2.1	1.1	0.7	1.9	3.7	6.8	130
Ussher Town	4.1	1.6	1.6	3.1	3.2	1.5	0.9	3.0	4.7	6.9	229
<b>Total</b>	<b>3.4</b>	<b>1.3</b>	<b>1.3</b>	<b>2.6</b>	<b>2.4</b>	<b>1.2</b>	<b>0.7</b>	<b>2.2</b>	<b>3.8</b>	<b>6.8</b>	<b>451</b>

Source: EDULINK/AARC data (2011)

With regards to the main occupation of household heads, results in Table 3.7 indicate that households whose heads were working in professional/technical/managerial/clerical occupations as at the time of interview consumed more unique food groups than those who were not working (mean HDDS of 7.5 compared to 5.9 respectively). This is because better jobs are associated with higher education level, higher incomes and thus these households can afford to purchase these rich micro-nutrient foods more frequently.

Specific to the frequency of consumption household heads working in the professional occupations consumed nearly all food groups more than three times as much as those who were not working at the time of the survey. In addition, their consumption was mainly foods

rich in vitamins such as fruits and vegetables (5.7 and 8.6 times respectively) compared to those not working at the time of the survey (0.2 and 1.2 times of fruits and vegetables respectively). Household heads working in other occupations such as skilled and unskilled manual jobs patronize consumption of cereals, animal source and vegetables prepared as stews/soups because they are staples/native foods and relatively cheaper and affordable. Also, households working in the sales sector are more disadvantaged than those in other occupation categories since they were only able to consume less than twice a week any of the food groups. Levin et al. (1999) found that sales is associated with meagre earnings such as petty trade and street vending and more female involvement whereas men are more likely to engage in professional, skilled and unskilled manual works which slightly pay more.

**Table 3.7:** Mean number of times various food groups were consumed and the mean HDDS (number of unique food groups consumed) in the last seven days prior to the survey by occupational status of household heads

Occupational status of household Heads										Mean HDDS	
	Cereals Based Staples	Tuber/ Roots	Fats/ Oils	Meat/ Fish/ Eggs	Baked/ Boiled/ Fried snacks	Soft drinks	Milk/ Dairy Products	Fruits	Vegetables	Mean HDDS	Number
No occupation	2.2	0.7	0.6	1.5	0.8	0.4	0.3	0.2	1.2	5.9	29
Prof/tech/man/cleric	6.8	3.0	3	4.7	6.1	3.0	2.3	5.7	8.6	7.5	66
Sales	1.9	0.6	0.5	1.6	0.8	0.4	0.3	0.4	1.6	6.4	161
Agric employed	2.1	0.5	0.3	1.6	0.7	0.3	0.2	0.2	1.3	6.2	16
Household&domestics	1.9	0.5	0.5	1.7	0.6	0.3	0.1	0.0	0.6	6.8	5
Service	1.9	0.5	0.6	1.6	0.7	0.4	0.2	0.4	2.0	6.8	41
Skilled manual	4.7	2.0	2	3.5	3.8	1.8	1.5	3.7	3.2	7.1	63
Unskilled manual	6.0	2.5	2.3	4.1	4.9	2.3	1.8	4.6	3.7	6.6	44
Other	1.8	0.3	0.4	1.6	0.6	0.4	0.2	0.0	0.6	6.5	19
Don't know	1.6	0.3	0.3	1.5	0.8	0.3	0.3	0.1	0.9	7.1	7
<b>Total</b>	<b>3.4</b>	<b>1.3</b>	<b>1.3</b>	<b>2.6</b>	<b>2.4</b>	<b>1.2</b>	<b>0.7</b>	<b>2.2</b>	<b>3.8</b>	<b>6.8</b>	<b>451</b>

Source: EDULINK/AARC data (2011)

Ethnic diversity is an important element when exploring a range of social forms of knowledge (de-Graft Aikins, 2011). Household heads who are Guan and Grussi consumed only four different varieties of food groups compared to eight by Mande household heads. The former are mainly migrant northern tribes who may be limited in the food varieties to consume. Household heads who are Ga-Dangme consumed on average the highest number of cereals,

vegetables and snack foods 4.1 times, 4.5 times and 3.0 times respectively followed by household heads that were Akan and a relatively lower frequency consumed by heads from other ethnic groups. This is so because the Gas are the indigenes who may not have a lot of cost to incur, and have relatively easy access to resources and food stuffs as those of other ethnic groups who are migrants who may need an extra effort to pursue a living. Results further show that the Ewe, Mole-Dagbani and Other ethnic groups (Guan, Gruma, Mande and Grussi) were not able to consume more than five different food groups at least once over the last seven days preceding the survey.

**Table 3.8:** Mean number of times various food groups were consumed and the mean HDDS (number of unique food groups consumed) in the last seven days prior to the survey by ethnic group of household heads

Ethnic group of household heads										Mean	
	Cereals Based Staples	Tuber/ roots	Fats/ oils	Meat/ Fish/ Eggs	Baked/ Boiled/ Fried snacks	Soft drinks	Milk/ Dairy products	Fruits	Vegetables	HDDS	Number
Akan	2.9	1.3	1.2	2.3	2.1	1.0	0.7	1.9	3.4	6.9	130
Ga-Dangme	4.1	1.6	1.5	3.0	3.0	1.5	0.9	2.9	4.5	6.9	248
Ewe	1.9	0.5	0.5	1.3	0.5	0.6	0.2	0.4	1.7	6.5	27
Mole-Dagbani	2.3	0.5	0.2	1.3	0.7	0.3	0.2	0.0	1.4	5.8	16
Other	2.0	0.6	0.5	1.7	0.9	0.5	0.4	0.3	2.0	7.3	30
<b>Total</b>	<b>3.4</b>	<b>1.3</b>	<b>1.3</b>	<b>2.6</b>	<b>2.4</b>	<b>1.2</b>	<b>0.7</b>	<b>2.2</b>	<b>3.8</b>	<b>6.8</b>	<b>451</b>

Source: EDULINK/AARC data (2011)

Results indicate that household heads who do not believe in any form of institutionally recognized religion (No religion) do not have any restrictions to the kinds of food groups consumed except through cultural limitations or individual tastes and preference. Overall, they ate food groups nearly two folds as those consumed by protestants and Pentecostal ranging between 2.2 times of milk products and 8.2 times of vegetables (more of the cooked than raw). Even though Islam and other Christians consumed more than seven varieties of food groups; religious affiliation was not significant in explaining the variations in dietary pattern. This means regardless of someone's religious affiliation, it does not so much affect whatever one consumed in within the reference period.

**Table 3.9:** Mean number of times various food groups were consumed in the last seven days prior to the survey by religious affiliation of household heads

Religious Affiliation of household heads										Mean HDDS	Number
	Cereals Based staples	Tuber/ Roots	Fats/ oils	Meat/ Fish/ Eggs	Baked/ Boiled/ Fried snacks	Soft drinks	Milk/ Dairy Products	Fruits	Vegetables		
No religion	6.8	3.1	3.0	5.0	6.1	2.8	2.2	5.5	8.2	6.6	34
Catholic	1.9	0.5	0.3	1.4	0.8	0.3	0.3	1.0	1.5	6.5	26
Protestants	3.6	1.4	1.4	2.8	2.5	1.3	0.9	2.5	3.9	6.8	103
Pentecostal/Charismatic	3.8	1.6	1.5	2.9	2.9	1.4	1.1	2.9	4.5	6.9	168
Other Christian	2.0	0.5	0.6	1.7	0.8	0.3	0.3	0.4	2.0	7.2	48
Islam	2.0	0.5	0.5	1.5	0.8	0.6	0.4	0.3	1.8	7.0	57
Traditional/Spiritualist	1.8	0.7	0.4	1.7	0.7	0.1	0.0	0.2	1.8	6.2	11
Eastern religions	1.1	0.3	0.1	0.0	0.1	0.6	0.0	0.0	1.2	6.0	1
Other	1.6	0.0	0.2	1.4	1.4	0.9	0.0	0.0	0.3	5.7	3
<b>Total</b>	<b>3.4</b>	<b>1.3</b>	<b>1.3</b>	<b>2.6</b>	<b>2.4</b>	<b>1.2</b>	<b>0.7</b>	<b>2.2</b>	<b>3.8</b>	<b>6.8</b>	<b>451</b>

Source: EDULINK/AARC data (2011)

### 3.3 Frequency of foods consumed by household expenditures on food

Increasing household expenditure has a positive influence on the dietary diversity as noted by Kennedy (2004). Households who spend a small percentage (less than 20) of the budget on food consumed more varieties of food groups than those who spent a huge percentage (80+) (mean HDDS 8.4 compared to 6.2). This could be due in part to the fact that households who spend a small percentage on food are usually those in the higher income groups and thus, they can purchase in bulk, quality and variety. Conversely, those in the low-income groups spend a larger percentage of their budget on food and yet purchase small quantity, low quality and less variety due to budget constraints. This resonates with findings elsewhere by Nakabo-Ssewanyana (2003) which suggest that, a rise in income may not necessarily lead to an increase in food expenditure but rather, an increase in the proportion of income spent on food purchase would lead to improved nutritional status. Results indicate that frequency of food groups consumed increases with an increase in the proportion of household expenditure on food. Households who in the last 30 days preceding the survey spent 80 percent and above of their monthly budget on food purchase consumed averagely more than five different food groups at least three times as much as those who did not spend at all in the seven days period

preceding the survey. This indicates that when household inject more money on food, the more quantity and variety of foods purchased. Conversely, households whose monthly spending on food is less than 50 percent of their monthly expenditure as per the reference period consumed on average less than once in the seven days period preceding the survey, half of the food groups above. Note that households who did not spend on food in the last 30 days prior to the survey perhaps were fishermen who survive on the sea, or exchange their fish for foods although this was not a common phenomenon.

**Table 3.10:** Mean number of times various food groups were consumed and the mean HDDS (number of unique food groups consumed) in the last seven days prior to the survey by household monthly expenditure on food in the last 30 days preceding the survey

Household Monthly expenditure on food	Cereals Based Staples		Tuber/ Roots	Fats/ Oils	Meat/ Fish/ Eggs	Baked/ Boiled/ Fried snacks	Soft drinks	Milk/ Dairy Products	Fruits	Vegetables	Mean HDDS	Number
	No expenditure	2.1	0.6	0.4	1.7	0.7	0.4	0.2	1.9	3.2	6.8	51
1-19 percent	1.6	0.5	0.6	1.5	0.7	0.5	0.2	0.3	2.1	8.4	32	
20-49 percent	2.0	0.6	0.6	1.7	0.9	0.4	0.3	2.1	3.8	6.9	117	
50-79 percent	3.9	1.5	1.5	2.8	2.8	1.3	1.0	2.7	4.3	6.8	169	
80+ percent	6.1	2.9	2.7	4.3	5.6	2.6	2.1	0.2	1.8	6.2	76	
<b>Total</b>	<b>3.4</b>	<b>1.3</b>	<b>1.3</b>	<b>2.6</b>	<b>2.4</b>	<b>1.2</b>	<b>0.7</b>	<b>2.2</b>	<b>3.8</b>	<b>6.8</b>	<b>445</b>	

Source: EDULINK/AARC data (2011)

### 3.4 Frequency of foods consumed by household support network and transfer

Household support network is a form of social capital which would supplement the meagre income and increase purchasing power of households. Consumption of varieties of food groups (see mean HDDS) for households who did not receive any assistance and those who received any did not significantly vary ranging between 6.5 for households who had no support and 6.9 for those who received kind support only. Results show that there are no significant variations in the frequency of food consumed by households who did not receive any form of assistance or transfers and those who received money only. Households who did not receive any support and those who received money only consumed most food groups more than twice a week. Data further shows that even though households who received both

money and kind consumed on the average consumed less than twice for all food groups, their consumption across all food groups seem to be uniformly spread. This is an indication that households who received other forms of support other than money only, were able to balance their diets. This could be attributed to the fact that households who received assistance in monetary terms could have used it to meet other basic needs such as medical expenses, education expenses, settling rental charges and for organizing one-off ceremonies other than on direct food purchase. Conversely, households who received assistance in-kind could probably not be able to exchange for food or convert to monetary term to aid in food purchase. This may be subjective, however, empirical evidence suggest migrant households find cross-sharing complicated in cities since they do with expectations to be repaid (Morris et al. 2002; Levin et al.1999).

**Table 3.11:** Mean number of times various food groups were consumed and the mean HDDS (number of unique food groups consumed) in the last seven days prior to the survey by household support network and transfer during the last 30 days preceding the survey.

Household Support network and transfer	Cereals Based Staples	Tuber/ Roots	Fats/ Oils	Meat/ Fish/ Eggs	Baked/ Boiled/ Fried snacks	Soft drinks	Milk/ Dairy Products	Fruits	Vegetables	Mean HDDS	Number
	No support	3.6	1.4	1.3	2.7	2.5	1.2	0.8	2.3	4.0	6.9
Money only	3.5	1.4	1.4	2.6	2.7	1.3	0.8	2.5	4.0	6.7	95
Kind only	1.5	0.7	0.6	1.6	0.5	0.4	0.1	0.0	2.4	6.5	4
Money& kind	2.1	0.6	0.5	1.7	0.7	0.5	0.3	0.1	1.5	6.7	37
<b>Total</b>	<b>3.4</b>	<b>1.3</b>	<b>1.3</b>	<b>2.6</b>	<b>2.4</b>	<b>1.2</b>	<b>0.7</b>	<b>2.2</b>	<b>3.8</b>	<b>6.8</b>	<b>451</b>

Source: EDULINK/AARC data (2011)

### 3.5 Household perceptions on food access

#### 3.5.1 Sufficient quality of foods

Results indicate no significant variations in the number of varieties of food groups consumed (mean HDDS). Based on the frequency of consumption, household heads who perceived their households to have sufficient quality foods to meet the requirements of their household members consumed most of the food groups three times as much as those who do not in the

last seven days preceding the survey. However, most of their consumption was skewed towards cereals, vegetables and very low consumption of milk products. Household heads who perceived their households to lack sufficient quality foods attributed these to a number of reasons such as seasonality of food making prices high and thus inability to afford especially during harmattan seasons, putting faith in God reiterated by a common statement as “by God’s grace” to imply they survive through a divine intervention, poor sanitation and unhygienic environment, food lose quality due to poor transport facilities. For instance, anecdotal report suggests that rotten tomatoes and frozen fish are being sold in the community markets, which may have lost quality before reaching final consumers.

**Table 3.12:** Mean number of times various food groups were consumed and the mean HDDS (number of unique food groups/varieties consumed) in the last seven days prior to the survey by household perception on the sufficient quality of foods to meet daily requirements of household members

Sufficient Quality of foods	Cereals Based Staples	Tuber/ Roots	Fats/ Oils	Meat/ Fish/ Eggs	Baked/ Boiled/ Fried snacks	Soft drinks	Milk/ Dairy Products	Fruits	Vegetables	Mean HDDS	Number
	Yes	4.1	1.7	1.6	3.0	3.2	1.5	1.0	3.1	4.8	6.9
No	1.9	0.6	0.5	1.6	0.7	0.3	0.2	0.2	1.7	6.6	132
Don't know	1.9	0.4	0.4	1.7	0.6	0.4	0.3	0.0	1.5	6.8	16
<b>Total</b>	<b>3.4</b>	<b>1.3</b>	<b>1.3</b>	<b>2.6</b>	<b>2.4</b>	<b>1.2</b>	<b>0.7</b>	<b>2.2</b>	<b>3.8</b>	<b>6.8</b>	<b>451</b>

Source: EDULINK/AARC data (2011)

### 3.5.2 Sufficient quantity of foods

Household heads who perceived their household to have sufficient quantity of foods to meet the daily requirements of their household members had higher frequency of food groups consumed compared to those who do not, in the past seven days preceding the survey. They consumed more than four food groups at least three times on a daily average as much as those who do not have sufficient quantity of food for household members. Out of nine food groups considered, household heads who perceived their households to lack sufficient quantity of foods for their members consumed less than once, more than half of the food groups. With further probing, inadequate quantity of foods for household members was attributed to

seasonal variations for instance during the hamattan season when certain foods are scarce, high market prices for foods and lack of fresh foods such as fish and tomatoes among others. Respondents also reported that the disappearance of certain foods which used to be eaten but no more available also could attribute to the limited foods for household members. These include foods such as “*Awule* fish”, barracuda fish, cassava fish, red fish etc else if available then have become very expensive (explanations provided from further probing in the open ended response). Also, nearness to source of foods such as markets, the sea and nearby eating joints accounts for confidence in sufficient quantity of food. For instance, the *Makola* market in Central Accra which serves both households in Ussher Town and James Town and Agbogbloshie market and proximity to sea for fish products all means food is available. However, what could limit access could be the ability to purchase food for households members (above 90 percent acquire food through market purchase) which may lead to preference for cheaper and low quality and small quantity of foods.

**Table 3.13:** Mean number of times various food groups were consumed and the mean HDDS (number of unique food groups consumed) in the last seven days prior to the survey by household heads perception on the sufficient quantity of foods to meet daily requirements of household members

Sufficient Quantity of foods										Mean HDDS	
	Cereals Based Staples	Tuber/ Roots	Fats/ Oils	Meat/ Fish/ Eggs	Baked/ Boiled/ Fried snacks	Soft drinks	Milk/ Dairy Products	Fruits	Vegetables	HDDS	Number
Yes	4.2	1.7	1.7	3.1	3.2	1.6	1.2	3.2	4.7	6.9	291
No	1.9	0.6	0.5	1.6	0.8	0.4	0.3	0.7	2.0	6.7	158
Don't know	1.1	0.3	0.4	0.9	0.6	0.0	0.6	0.0	1.2	7.0	2
<b>Total</b>	<b>3.4</b>	<b>1.3</b>	<b>1.3</b>	<b>2.6</b>	<b>2.4</b>	<b>1.2</b>	<b>0.7</b>	<b>2.2</b>	<b>3.8</b>	<b>6.8</b>	<b>451</b>

Source: EDULINK/AARC data (2011)

Significant to note from the above results examining the relationship between household characteristics and dietary diversity is that, a household consumption of a food group many times may not necessarily translate into quality or higher dietary diversity. A household is expected to have consumed at least four or more different food groups. Excessive consumption of certain foods groups for instance low nutrient energy dense foods, snack

foods and fats/oils without a proportionate balance with other food groups are associated with risk factors such as chronic non-communicable diseases and obesity. This may be a result of a combination of poor lifestyle (sedentary) and poor dieting.

## CHAPTER FOUR

### RELATIONSHIP BETWEEN HOUSEHOLD CHARACTERISTICS AND DIETARY DIVERSITY

#### 4.0 Introduction

This chapter presents the linear regression model for the interaction and linear association between household demographic and socio-economic characteristics and household dietary diversity (consumption of food varieties). For all independent and control variables included in the model, only educational status of household heads, household wealth quintiles, sex of the household heads and source of food eaten by household heads (Home and Outside home) were statistically significant at  $P < 0.05$  as interpreted below. Dummies were created for variables such as; sex, educational level, household wealth status, ethnic groups, occupational status, religious affiliation of household heads, location of households, perceptions on food sufficiency, food avoidance due to taboo and household support and transfers. The rest of the variables such as; age, household size, household food expenditure and the mean consumption of food groups at home and outside home were entered as continuous variables. Reference categories are as presented as a foot note at Table 4.1

#### 4.1 Source of food (meal)

The source of food consumed by household heads was at home and those outside the home which included; street vendor, fast food joint, restaurants and chop bars regardless of whether the meal was breakfast, lunch or supper. Both sources of foods were entered in the model as two separate continuous predictors of HDD to examine the linear relationship between the predictors and response variables. While controlling for the effect of age and sex of household heads, household wealth status, occupation and ethnic group of household heads,

**4.1.1 Home foods:** Results indicate a negative association between HDD and food groups consumed in a home. There was a strong significant association at  $p\text{-value} < 0.001$  between mean number of times various foods were eaten at home in the last seven days preceding the survey and food varieties (dietary diversity). A beta value of  $-0.231$  indicate a  $0.231$  unit reduction in HDD for households whose heads consumed their food groups at home. This could be due to the fact that homemade food are only of a specific kind, therefore it limits a household to the consumption to one kind of food before new or a fresh meal is prepared. Anecdotal report seem to suggest that quite a number of households would preserve home prepared stews/soups/sauce, kenkey and banku or fufu in refrigerators over a period of time given the busy nature of urban life for even days or weeks. This limits the consumption of other food kinds unless what has been preserved is replenished (see evidence in Anarfi and Ahiadeke, 2006) and yet other studies suggest them as the more hygienic with less gastrointestinal bacterial infections (see example in Mensah et al. 1995; WHO, 2002).

**4.1.2 Foods outside home:** Conversely, results also show a strong positive relationship between HDD and consumption of food outside the home. A positive beta coefficient of  $0.764$  indicates a  $0.764$  unit increase in HDD for households whose heads consumed their food groups outside the home. This was also statistically significant at  $0.001$  confident levels. This finding seems to contradict results in the mean number of times various food groups was consumed at home and outside the home. Previous results presented in Table 2.2 indicate a relatively higher mean frequency of food groups consumed at home compared to those eaten outside the home. This seem to suggest that food outside the home are readily available for consumption for as long as one has the ability to purchase and besides one has a variety to make a choice from than foods prepared at home where stews/sauces (animal, vegetable, poultry and fish, etc) and staple foods such as kenkey can be preserved in a refrigerator for

days or weeks which may result into wastage if not consumed to completion before preparing another (explanations from probe during field work, 2011).

**4.2 Sex of household heads:** Setting the female-headship as a dummy, positive results of the standardized coefficient indicate that male-headed households are more likely to have a 0.068 unit increase in their household dietary diversity than their female counterparts. This was also statistically significant at  $p < 0.05$ . Possible explanations could be attributed to differences in access, allocation of resources and also male-heads of household are relatively more educated than their female-heads counterparts which could pave way for high purchasing power and have better nutritional knowledge compared to their female counterparts. The study findings support the observations made elsewhere (see for example, Maxwell et al. 2000; Levin et al. 1999) that female-headed households are more vulnerable to food insecurities than those headed by their male counterparts. Also, Levin et al. (1999) revealed that the kind of work female are involved such as petty trading and street vending including food vending earn irregular and low income and demanding alongside family responsibilities such as child care and other household chores. Also, further suggestion by Codjoe and Owusu (2011) that the presents of male is advantageous in that it increases the chance of accessing food, income and other resources.

**4.3 Highest educational level of household of heads:** As expected education level of the household head indicated a positive influence on household dietary diversity although it was statistical significant at 0.05 confident levels only for those with secondary and higher education. This relationship is evidenced by the positive value of the coefficient of beta indicating an increase in the HDD between 0.075 units for households whose heads had primary education and 0.289 units for households whose heads had higher education. This finding suggests that encouraging household members to achieve at least middle and secondary education would have tremendous influence on improving nutritional adequacy and quality at household and individual level. The relatively lower percentage increase in HDD for household whose heads had primary education could be attributed to that fact that most of

these household heads are petty traders and street vendors whose earnings are relatively low and irregular and also lack access to adequate nutritional knowledge thus inhibiting dietary diversity. Conversely, households whose heads had SHS/secondary and higher education are those engaged in professional occupations which are associated with better employment opportunities which would earn higher income thus increasing purchasing power and also increase their access to knowledge on nutritional benefits of balanced diet.

**4.4 Household wealth status:** Evidence in Table 4.1 suggests that Household dietary diversity increases with an improvement in the household wealth status. The parameter estimates of beta indicate a 0.102 unit increase in HDD among the poor households, and the unit increase sharply dropped to 0.022 units for middle class households and rose to optimal at 0.149 units for the household in the richest quintile. The result was only statistically significant at  $p < 0.01$  for the richest group and at  $p\text{-value} < 0.05$  confident levels for the households in the poor quintile. Households in the poorest and poor quintiles are inclined to buy food stuffs in small quantities, low quality with limited varieties and more frequently and yet spend a relatively larger proportion of their income on food purchase compared to the middle and rich class who would purchase in bulk and store the foods purchased because they can afford before replenishment. However, those in the rich and richest class have more organize resources and financial capability to nourish its household members with diverse food groups.

The model produced an overall adjusted R-square value (coefficient of multiple determination) of 0.409, implying that 40.9 percent of the changes in household dietary diversity were explained by household characteristics (all the independent variables) included in the model while controlling for confounding factors such as age, sex, educational level, religious affiliation, ethnic groups of household heads and household wealth status while the remaining 59.1 percent can be explained by other factors such as climate change/variability which may disrupt the food systems, direct market prices of food commodities, government regulation of domestic and international trade policy related to consumable goods, cultural factors which may be more of individual taste and preference, illnesses and so on.

**Table 4.1 A linear regression analysis showing the association between household characteristics and dietary diversity**

	<b>Standardized coefficients of Beta (<math>\beta</math>)</b>	<b>Standard Error</b>
<b>Intercept (<math>\alpha</math>)</b>	3.313***	0.627
Household size (Number)	-0.034	0.055
Age of household heads (years)	0.022	0.012
Household food expenditure (%)	0.269	0.012
<b>Educational level of household heads</b>		
Primary	0.075	0.492
JHS/Middle	0.094	0.474
SHS/Secondary	0.169*	0.517
Higher	0.289**	0.688
<b>Household wealth status</b>		
Poor	0.102*	0.377
Middle	0.022	0.425
Rich	0.094	0.296
Richest	0.149**	0.385
<b>Sex of household heads</b>		
Male heads	0.068*	0.800
<b>Locality</b>		
James Town	0.020	0.396
Ussher Town	0.029	0.385
<b>Occupational status of household heads</b>		
Professional/technical/managerial/clerical	0.033	0.482
Agric self employed	0.029	0.453
Sales	-0.053	0.713
Household and domestics	0.008	1.123
Service	-0.052	0.546
Skilled manual	0.086	0.498
Unskilled manual	0.027	0.528
Other	-0.031	0.681
<b>Ethnic group of household heads</b>		
Akan	-0.068	0.277
Ewe	-0.047	0.488
Mole-Dagbani	0.000	1.670
Other	-0.025	1.386

**Table 4.1: (Continued)**

<b>Religious affiliation of household heads</b>		
No religion	0.099	1.349
Muslims	0.100	1.400
Traditional/Spiritualist	0.000	1.522
Other	0.003	2.688
<b>Source of foods</b>		
Food eaten at home (Mean)	-0.231***	0.002
Food eaten outside home (Mean)	0.764***	0.045
<b>Perception on sufficient quality of food</b>		
Food quality is not sufficient	-0.035	0.283
<b>Perception on sufficient quantity of food</b>		
Food quantity is not sufficient	0.060	0.270
<b>Food avoidance due to taboo</b>		
No food taboo	0.059	0.276
<b>Household support and transfers</b>		
Received household support	-0.033	0.251
<b>Adjusted R squared= 0.409</b>	<b>***p&lt;0.001</b>	<b>**P&lt;0.01</b>
		<b>*P&lt;0.05</b>

Source: EDULINK/AARC data (2011)

1. Sample size (N) = 451 excluding one missing case
2. F-statistics = 36.901\*\*\* and Mean sum of squares = 29.966
3. RC: Reference category (No education, Females, Poorest, No occupation, Agbogbloshie, Ga ethnic group, Christians, Food quality is sufficient, food quantity is sufficient, Food taboo present, did not receive household support and transfers)
4. Note: Controlling for the effect of age, sex, education of household heads, and household wealth status, and locality, ethnic and religious affiliation of household heads.

## CHAPTER FIVE

### SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSION

#### 5.1 Summary of findings

While some of the results based on the descriptive and linear regression analyses of the association between household characteristics and dietary diversity was consistent with what has previously been reported in the urban literature, some do not. Nevertheless, they do yield a substantive result that will presumably be useful to policy makers and a guide for further research.

Slightly more than one-third of the households were single member households, more than two-thirds of the households did not receive any assistance either money or kind in the last 30 days preceding the survey, slightly above 40 percent of household heads had attained at least JHS/middle school and slightly more than half were Ga-Dangme since these is an indigenous Ga community. However, because of the cosmopolitan nature of Accra city, there are patches of other ethnic groups such as Ewe, Akan and relatively lower proportion of the Northern tribes. All these are important for examining the food security at all levels and they corroborate what previous studies have found.

These associations, which are found in all three communities and across other household characteristics, do not depend on the method used to assess these associations, nor when using the number of unique food groups consumed is the measure of dietary diversity. There is strong significant association between dietary diversity and source of food eaten at the household level at p-value 0.01. The magnitude of this association is considerably weaker between most of the household characteristics and dietary diversity as indicated by the standardized coefficient of beta ranging between -1 and +1 except for food eaten outside the

home which presented a beta value of 0.764. Accordingly, dietary diversity would appear to show promise as a means of measuring food security and monitoring changes and impact, particularly when resources available for such measurement are scarce.

With the exception of educational level of the household head, household wealth status, sex of household heads, source of food (eaten at home and outside the home) and the rest of the predictor variables used in the model were not statistically significant at  $p < 0.05$  in predicting dietary diversity. High education level is associated with better employment opportunities, higher income therefore higher purchasing power and the ability to access information to enhance nutritional knowledge. This suggests that promoting education especially female education to at least secondary education would tremendously improve nutritional adequacy and quality. Conversely, households who had primary education are characterized by people primarily engaged in sales, such as petty trade, street vending and unskilled manual jobs which earn low income and irregular. This would mean that these categories would have low purchasing power which would limit their dietary diversity.

With regards to household wealth status, households in the richest quintiles were better off in terms of the number of food varieties consumed in the last seven preceding the survey than those in the poorest and poor quintiles as indicated by the coefficient of beta values in Table 4.1. This could be an indication of the differences in the levels of organization and allocation of resources, educational level, and access to social amenities and other basic necessities which increase the household's ability to provide sufficiently to meet the daily requirement of its members (see example in Maxwell et al. 2000). Therefore, households in the higher wealth quintile stand a better chance to have better opportunities and ability to access resources than those in the lower quintiles which would improve their dietary diversity.

Results suggest that household heads consumed relatively more unique food groups outside the home but a relatively higher frequency of consumption was in homemade foods. The model presents a very strong significant association (p-value 0.01) with dietary diversity. The source of food eaten is important particularly in urban environment which are busy and rush hours as people try to fend for a living. Besides foods prepared outside the home saves time, and gives many options from which one can choose variety of foods to eat as long as one has the ability to pay for the food. In relations to hygiene practices, levels of gastrointestinal bacterial contamination (food safety), food eaten outside the home may not be as healthy as those prepared and consumed at home (see example Mensah et al. 1995; WHO, 2002).

However, important to note is that all predictor variables that were not statistically significant at p-value 0.05 presented very interesting patterns in the coefficient of beta which could provide plausible explanations as to why dietary diversity varies across socio-economic groups. For instance, a unit increase in the household size would lead to a 0.034 unit reduction in HDD whereas household food expenditure and age of household heads showed a positive effect on HDD which suggests that an increase in any of the two variables would lead to a rise in HDD by a corresponding proportion as indicated by the values of beta (0.269 and 0.022 respectively).

The proportion of male-heads household was three times as much as female-heads of house. The finding was consistent with the national average of 34 percent of female headed households (GSS, 2008). Also, male-heads of household consumed more food varieties than their female counterparts even though the latter had a higher frequency of consumption. Females consumed all food groups slightly more times (higher frequency) than male-heads because they are the ones who mostly prepare/cook the meals, also most females operate food joints and therefore, consume directly from their sales but would not be able to eat from a variety. Conversely, the male-heads would eat more varieties but less frequently. The

presence and greater proportion of males in households in such an African setting is advantageous in terms of access to resources, food and provision of basic necessities for members. This corroborates Codjoe and Owusu (2011) findings in the Afram Plains of Ghana and Levin et al. (1999) in the Greater Accra region. Although sex of the household heads was not had a weak significant association with HDD, it is an important indicator for exploring food security components.

Most of the urban poor households in the sample are employed in the informal sectors where earnings are very low and irregular. Women are mostly associated with sales; street vendors and petty trades which earn low and irregular incomes whereas the men are involved in the professional, skilled and unskilled manual jobs as posited by Levin et al. (1999). These have serious consequences for household food security in terms of purchasing power.

It is evident from the study findings that consumption of a variety of foods by the urban poor households may not necessarily increase their probability of meeting the daily dietary requirements. In addition, the consumption of one food group many times over the reference period may not necessarily translate into higher dietary diversity. However, on average most households consumed at least more than six different food groups in the seven days period prior to the survey. This in accordance with Kennedy et al. (2010) and FAO (2011) categorization of HDD indicate that these households have high dietary diversity.

More than half of the households spent more than half of the total monthly expenditures on food purchase in the last 30 days preceding the survey. It can be noted that from the results even in very poor households, increased food expenditure resulting from additional income is associated with increased quantity and quality of the diet. However, the share of income spent on food may be high but may not necessarily be enough to purchase quality and varied foods as they are associated with relatively higher prices. These push households in the lower

income groups who are known for spending a higher proportion of their income on food to consume more of low quality foods.

Foods staples mostly cereal based and starchy roots and tubers, which are richer in one nutrient but deficient in others, are the most commonly eaten foods. These food staples such as *kenkey*<sup>30</sup>, *banku*<sup>31</sup>, *akple*<sup>32</sup>, *fufu*<sup>33</sup>, *gari*<sup>34</sup>, yam and plantain are energy dense foods which are also considered to be monotonous diets (Kennedy et al. 2010) common in food insecure areas. They are usually accompanied by meat, fish or eggs and vegetables prepared in the form of stews/soups or sauces. Given the sedentary lifestyle and occupations in these communities, excessive consumption of these starchy and oily food groups without balancing with other food kinds increases the risk of obesity, diabetes and other chronic, non-communicable infections. This evidence is further supported by the report of FAO (2011) on the Ghana food security indicators which suggest that share of cereal and roots and tubers in the Dietary Energy Supply (DES) was 66.7 percent and 15.2 percent of fat composition in DES and relatively low animal protein consumption between 2006 and 2008. Also, Dake et al. (2010) indicate that obesity in Ghana has increased 1.2 folds from 25.5 in 2003 to 30.5 in 2008. Also there was a relatively higher consumption of snacks/processed foods which is a typical characteristics of urban environment since people would not have time to prepared food on their own, and these are readily available for direct consumption.

Interesting to note is that on average, most household heads consumed more than six unique food groups in the seven days period preceding the survey. This suggests a relatively high dietary diversity in accordance with the FAO (2011) and Kennedy et al. (2010) cut-off points. The study results also show that there was low consumption of foods rich in vitamins and iron

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<sup>30</sup> Kenkey-made from fermented maize/corn dough

<sup>31</sup> Banku -made from fermented cassava dough

<sup>32</sup> Akple-made from dried powder maize

<sup>33</sup> Fufu-Boiled root, tuber or starchy fruit that is pounded (usually swallowed with soup)

<sup>34</sup> Gari-Cassava made into grits and roasted

such as fruits, and milk products especially among the larger household size (six or more members), older household heads (40 years and above) and households whose heads had no education. A plausible explanation could be due to low income (purchasing power), unemployment problems, high market prices of these food items and lack of nutritional knowledge which may ultimately increase the risk of these households become food insecure. According to the Final draft policy framework for Ghana (2010-2013), Ghana has a supply-consumption deficit of livestock and poultry product largely due to low genetic materials of livestock, poor management practice and low productivity making market prices of these products unaffordable by low-income populace.

Households have used several approaches to cope with shortage of food especially if they do not get enough of what they want to eat. For instance, reducing the amount of food to consume, consumption of low quality foods which perhaps are relatively cheaper to meet the budgetary needs, sharing food from the same bowl, do nothing and sleep on empty stomach. Interesting to note was that some households seem to be content with the quality and quantity of foods available to meet the daily requirements of their household members while others would prefer to seek for divine intervention.

## 5.2 Conclusion

- ❑ Dietary diversity is an important indicator for measuring food security if used carefully alongside other components of food security measures.
- ❑ Household characteristics (demographic and socio-economic) are important predictors of HDD based on the estimates of coefficient of beta, adjusted R square and the significance levels at  $p < 0.05$ . Based on results from the linear regression model, the study accepts all the three hypotheses.

- ❑ Most disadvantaged households based on chances of having lower dietary diversity included; households with six or more persons, households headed by females, households who spend a higher percent of expenditure on food, households whose heads had no education and older household heads (40 yrs and above). This is because food consumption depends largely; if not entirely on cash exchange/purchasing power which has tremendous implication for food quality, quantity, and variety.
- ❑ As earlier hypothesized in the study, only a few of the household characteristics such as educational level of household heads, sex of household heads and household wealth status and sources of meal were significant in predicting dietary diversity. This may suggest the need to include other external factors that may not necessarily be socio-economically related to food utilization.
- ❑ The study suggest that the consumption of one food group many times may not necessarily mean higher dietary diversity but rather the consumption a variety of food groups within a given period of time. Also, it is significant to use other components of food security such as food access and availability alongside dietary diversity in order to have a more comprehensive approach to measure food utilization.
- ❑ Household coping mechanisms to food shortage were adopted in order to adjust to the inadequacy of food of household consumption. These included consumption of less but lower quality foods and further reducing number of meals as well choosing preferred types of foods for budgetary reasons. However, the study found that cost-sharing, food exchange and distress sale of household assets, forfeiting payment of utility bills to cope with food inadequacy was not so common among households in the study.

- ❑ In summary, the increasing numbers of the urban poor population whilst the rising food prices and the associated food insecurity problems should be a major concern among policy makers at all levels of national development. Policy makers should recognize the rate of urban growth outstripping provision of social services. As well reverse the current bias on poverty, malnutrition and food insecurity and interventions towards rural areas and pay some attention to the urban poor. It is noted in the final draft policy framework for Ghana Shared Growth and Development Agenda (GSGDA, 2010-2013), that there is generally lack of a national nutrition and food security policy. In developing a food and nutrition policy, it should be designed in such a way that is flexible and broad based to reflect the needs, conditions and resources of the wider populace.

### **5.3 Recommendations**

Based on the key findings above, as previously discussed, the urban poor do not only depend on market for food purchase but also spend the largest share of their total monthly budget on food. The informal activities in the urban poor communities should not be overlooked as a menace but rather a strategy to address the problems of unemployment. Even if many may argue that Accra receives plenty food supply from other parts of rural Ghana, the poor may not have access without adequate purchasing power.

In the short run, there is need to encourage households to increase intake of other food groups other than concentrate on the consumption of cereal based staples. For instance, food groups such as fruits and milk/dairy products through nutritional educational campaigns in order to appreciate the nutritional benefits of such food groups in meeting their daily nutrient requirements. This can be achieved with a subsequent increase in production and supply of such food commodities (horticulture) in the long run rather than encouraging massive

production of low nutrient energy dense foods. As well, regulating influx of imported food products while subsidizing the cost of those locally produced food commodities and infrastructural improvements will go a long way in regulating distribution and market prices making them not only available but also affordable.

Considering the consumption patterns as indicated in the findings above, in Ghana and Accra in particular, food consumption are deeply entrenched in people's culture making attempts to introduce new but more nutritious foods difficult. For instance, staple foods such as kenkey, banku, fufu and akple and specific kinds of food prepared during festive seasons such as *kpekple*<sup>35</sup> during the *homowo*<sup>36</sup> festival and “*ɔto*<sup>37</sup>” prepared during birthday celebration. Promoting a shift to richer natural organic foods should be at the core of a long term strategy. Nevertheless, there is further need for a more rigorous nutrition education meant to change consumption behaviours and sensitization programmes to promote awareness of the danger involved in dietary inadequacy or excessive consumption of specific diets. This would further challenge organs at the fore front of policy making about the silent emerging issues such as obesity, cardio-vascular diseases, and diabetes.

With regards to household dietary diversity (HDD) used as a proxy measure to food security in this study, results suggest that HDD may not be sufficient to provide conclusive evidence of food insecurity unless used in a combination with factors determining food security status such as food access, availability and stability. Owing to the study findings, further research is needed; to address the paucity of data on food consumption at intra-household level, which will allow for development and testing of a more comprehensive, reliable and valid measure of food security. HDD can be used as a predictor of health outcomes such as obesity (Body

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<sup>35</sup> Kpekple a staple food made of dried gritted maize dough mixed with palm oil

<sup>36</sup> Homowo literally means saying” Shame to Hunger” usually celebrated in August by the Ga (definition may vary in context)

<sup>37</sup> *ɔto* is boiled plantain mashed and mixed with palm oil and ground pepper

Mass Index), cardiovascular diseases, hypertension and nutritional outcome (stunting, wasting and underweight) which the study recommends as potential areas for further research. When HDD is appropriately used alongside other components of food security measures such as food access and food availability, it may yield a substantive proxy measure to food security at individual, household, community and national levels.

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