Household Food Security and Child Diet in Northern Regions of Ghana: Evidence from the 2012 Ghana Feed the Future Population Baseline Survey

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Abstract

Background and Objectives: There is dearth of literature on the link between household food security and child feeding practices in sub-Saharan Africa. Therefore, this study investigated the relationship between level of household food security and achievement of recommended child feeding practices (minimum meal frequency, minimum dietary diversity, and minimum acceptable diet) in northern regions of Ghana. Also, the study investigated the relationship between socio-demographic characteristics and achievement of recommended complementary feeding practices.

Conceptual Framework: The Model of Childcare was used as both the conceptual and analytical framework of the study. The model posits that childcare resources (food security resources, maternal resources, and infrastructure resources) exert influence on child health and development through childcare. Also, happenstances and genes in the childcare model directly influences child health and development. Context in the Model of Childcare either directly exert influence on child health and childcare or indirectly through childcare resources.

Methods: Using child data from the 2012 Feed the Future baseline survey (n = 871), logistic regression was performed to assess the impact of household food security factors, maternal characteristics and contextual factors on the likelihood of 6-23 month old infants and children receiving recommended minimum meal frequency, minimum dietary diversity, and minimum acceptable diet.

Results: About 36% of children were in food insecure households, and 64% of the children were in food secure households. Chi-Square test of independence indicated inadequate and adequate recommended feeding of children in both food secure and food insecure households. Children in food secure households were significantly more likely than children in food insecure households to achieve recommendations for minimum dietary diversity [O.R= 0.62; 95% CI: 0.43, 0.91] and minimum acceptable diet [O.R= 0.62; 95% CI: 0.40, 0.97]. There was no significant association between household food security status and minimum meal frequency. Compared to infants (6-11 months), children in the age groups 12-17 months [O.R=0.32; 95% CI: 0.21, 0.48] and 18-23 months [O.R= 0.18; 95% CI: 0.12, 0.29] were significantly more likely to achieve to achieve minimum dietary diversity. Also, compared to infants (6-11 months), children in the age groups 12-17 months [O.R=0.34; 95% CI: 0.21, 0.55] and 18-23 months [O.R= 0.42; 95% CI: 0.24, 0.71] were significantly more likely to achieve minimum acceptable diet. Region of residence, household size, and maternal dietary diversity were significant predictors of complementary feeding practices in the northern regions of Ghana.

Discussion and Conclusions: There was a decent amount of variance accounted for in the analysis of minimum dietary diversity (.20-.30), modest for minimum acceptable diet (.09-.15) and almost nothing for minimum meal frequency (.02-.03). For minimum dietary diversity and minimum acceptable diet, the models are about the same, and household food security status has importance even accounting for every predictor variable in the models, including a powerful effect of child age. The rejoinder is that how one operationalizes child nutrition care is important; certain aspects of child feeding are significantly related to household food security status (minimum dietary diversity and minimum acceptable diet) and others are not (minimum meal frequency). While household food security was related to two measures of child feeding adequacy, there were instances of underfed children in food secure households and of well-fed children in food insecure households in northern Ghana.

Also, child age is related to two measures of child feeding adequacy (minimum dietary diversity and minimum acceptable diet). Although children within the youngest age group (6-11 months) were at risk of being underfed, there were instances of inadequate and adequate recommended feeding of children across the three age groups (6-11 months, 12-17 months, and 18-23 months).

The further study of these groups may shed light on how caregivers can be assisted to achieve adequate child feeding, irrespective of the household's food security situation and the age of the child.

Keywords: food security, minimum dietary diversity, minimum acceptable diet, minimum meal frequency, Model of Childcare.

CHAPTER ONE
INTRODUCTION

1.0 Background

Elimination of food insecurity and malnutrition were healthy public policy concerns during the second international conference of health promotion in Adelaide (WHO, 1988). From a health promotion paradigm, food, peace, shelter, education, income, a stable eco-system, sustainable resources, social justice, and equity are the prerequisites and resources of health (WHO, 1986, p. 1). An improvement in health of people requires "a secure foundation in these basic prerequisites"(WHO, 1986, p. 1). Health promotion seeks to empower people to increase control over the determinants of their health (WHO, 1986). Food is one of such determinants of health. Also, the second Sustainable Development Goal (SDG) seeks to "end hunger, achieve food security and improved nutrition and promote sustainable agriculture" in the world (Corbin, 2015, p. 2).

Therefore, a complete understanding of the relationship between food security and complementary feeding, a key pathway to child health and development, helps shape the health promotion and the SDG discourse on food security and child nutrition. The overarching objective of the present study is to investigate the relationship between level of household food security and achievement of recommended complementary feeding among 6-23 months old infants and children in northern regions of Ghana (Brong Ahafo, Northern, Upper East, and Upper West). The study also examined the relationship between socio-demographic characteristics and achievement of recommended complementary feeding among 6-23 months old infants and children in northern Ghana.

The 1,000 days between a mother's pregnancy and her child's second birthday is a window of opportunity and vulnerability of a child's life (Dewey, 2003; Du Plessis, Kruger, & Sweet, 2013). Here, complementary feeding among 6-23 month old infants and children is critical because adequate complementary feeding and childcare could ensure significant child growth and development (Stewart, Iannotti, Dewey, Michaelsen, & Onyango, 2013). Complementary feeding is "the process starting when breast milk is no longer sufficient to meet the nutritional requirements of infants, and therefore other foods and liquids are needed, along with breast milk" (WHO, 2009, p. 4). The consequences of inadequate complementary feeding practices range from morbidity, future learning inabilities, inadequate future work capacity and production (Dewey, 2003; Lutter et al., 2011).

As at 2011, the global estimate for the achievement of recommended complementary feeding among 6-23 months old infants and children are: 33% for minimum dietary diversity (MDD); 50% for minimum meal frequency (MMF); and 21% for minimum acceptable diet (MAD) (Lutter et al., 2011, p. 1418). In Ghana an estimated 47% of 6-23 months old infants and children have achieved the MMD requirement, 50% of 6-23 months old infants and children have received the required MMF, and only 20% of children within the same age group have met the MAD requirement (WHO, 2010a).

As at 2008, among 6-23 months old infants and children in the Brong Ahafo region, an estimated 66.7% achieved MMF, 58.6% achieved MDD, and 46.3% achieved MAD (Ghana Statistical Service (GSS) and Macro International Inc. (MI), 2009). Among 6-23 months old infants and children in the Northern region, 56.9% achieved MMF, 27.9% achieved MDD, and 22.4% achieved MAD (Ghana Statistical Service (GSS) and Macro International Inc. (MI), 2009). In Upper East, 76.5% of the children achieved MMF, 33.5% achieved MDD, and 27.9% achieved MAD (Ghana Statistical Service (GSS) and Macro International Inc. (MI), 2009). Among 6-23 months old infants and children in Upper west, 74.8% achieved MMF, 53.4% achieved MDD, and 47.7% achieved MAD (Ghana Statistical Service (GSS) and Macro International Inc. (MI), 2009). The 2012 Feed the Future Population Based Survey (FTF-PBS) results indicated that only 15.54% of 6-23 months old infants and children received a MAD in the four northern regions of Ghana (Zereyesus, Ross, Amanor-Boadu, & Dalton, 2014), which implies that majority of children (84.46%) in the four northern regions are not receiving MAD.

In both the Model of Childcare (Amugsi, 2015; Matanda, 2015) (the conceptual framework of the study) and the WHO framework on Childhood Stunting (Stewart et al., 2013), household food security impacts child health and development through direct influence on infant and young child complementary feeding practices. Food security occurs when "people at all times have physical, social and economic access to sufficient and nutritious food that meets their dietary needs for a healthy and active life"(FAO, 1996, p. 4).

Globally, the 2014 global food security index (GFSI) report indicated that food security scores have improved (GFSI, 2014b). The GFSI considered affordability, availability, and quality and safety of food in their determination of the scores (100 points score). The country in sub-Saharan Africa with the highest score (61.1) is South Africa (GFSI, 2014b). Ghana ranked 78th (out of 109 countries) with a GFSI score of 43.1, which is 13 points away from

the countries' average score of 56.1 points (GFSI, 2014b). In the GFSI report, Ghana is among the top five countries that have suffered 10% food loss in its food supply (GFSI, 2014b). Food loss, a significant predictor of food insecurity, "occurs mainly during the early phases of the food supply chain—at the production, post-harvest and processing stages—when food intended for human consumption is destroyed, degraded or otherwise unused" (GFSI, 2014b, p. 31).

The causes of food insecurity in many developing countries are attributed to poverty, poor food policy environments, climate change, inadequate food production and high levels of institutional corruption (GFSI, 2014a; Sasson, 2012). In many food insecure countries, the population is deprived of nutritious diets and lack of regulated bodies on nutritional standards (GFSI, 2014a). It is not surprising that many studies have documented high prevalence of malnutrition in Ghana, especially in the northern region (Amugsi, Mittelmark, & Lartey, 2013; Zereyesus et al., 2014) where one out of every three household (39.43%) is experiencing moderate to severe hunger (Zereyesus et al., 2014).

1.1 Problem Statement

There is strong evidence suggesting that complementary feeding practices are potential pathways for child nutritional outcomes in poor resourced settings (Amugsi, Mittelmark, & Lartey, 2014; Arimond & Ruel, 2004; Disha, Rawat, Subandoro, & Menon, 2012; Marriott, White, Hadden, Davies, & Wallingford, 2012; Reinbott et al., 2015; Saaka, Wemakor, Abizari, & Aryee, 2015; Sawadogo et al., 2006). Studies have investigated the determinants (maternal, infrastructural, context, and diseases) of complementary feeding practices (expanded in chapter two).

However, there is dearth of literature on the relationship between level of household food security and complementary feeding practices in sub Saharan Africa. Studies that used the Ghana Demographic Health Survey to assess the relationship between socio-demographic characteristics and infant and young child feeding (IYCF) practices have not included household food security variable because the DHS dataset has no data on household food security status (Amugsi, Mittelmark, Lartey, Matanda, & Urke, 2014; Issaka, Agho, Page, Burns, & Dibley, 2014). In the FTF-PBS dataset, however, household hunger scale (HHS) was used to collect data on household food security status (Zereyesus et al., 2014). The only publication on the nutritional outcome of children with the FTF-PBS did not investigate the

relationship between household food security and infant and young child feeding (IYCF) practices (Malapit & Quisumbing, 2015).

Therefore, the present study has, in part, filled an existing gap in the literature, by using the Household hunger scale (HHS) as a household level food security measure in relation to child diet. The HHS has been specifically developed as a meaningful measure of household food deprivation and has been validated for cross-cultural use (Ballard, Coates, Swindale, & Deitchler, 2011).

Furthermore, it is evident in the literature that child age and sex are important determinants of complementary feeding practices (Amugsi et al., 2013; Issaka et al., 2015a, 2015b; Kimani-Murage et al., 2011; Semahegn, Tesfaye, & Bogale, 2014). With regard to child age, children within the youngest age bracket (6-11 months) were less likely to receive adequate complementary feeding in certain studies (Beyene, Worku, & Wassie, 2015; Issaka et al., 2015b; Joshi, Agho, Dibley, Senarath, & Tiwari, 2012; Kabir et al., 2012; Ng, Dibley, & Agho, 2012; Nguyen et al., 2013; Wang, Li, Sun, Huo, & Dong, 2011; Victor, Baines, Agho, & Dibley, 2014). In other studies, children in the oldest age bracket (18-23 months) were rather less likely to receive recommended complementary feeding practices (Heidkamp, Ayoya, Teta, Stoltzfus, & Marhone, 2015; Issaka et al., 2015a).

In connection with child sex, a study, using a nationally representative data from Ghana, observed that decline in child malnutrition for boy children were significantly greater compared to their girl counterparts (Amugsi et al., 2013). However, there is no study that illuminates these child sex and age differentials in complementary feeding practices in the northern regions of Ghana.

1.2 Research Questions

Based on the gap in the existing literature (indicated in the problem statement), the following research question emerged and guided the study:

1. What is the relationship between the level of household food security and infant and young child complementary feeding practices—MMF, MDD, MAD—in the northern regions of Ghana?
2. What is the relationship between child sex and age and complementary feeding practices in the northern regions of Ghana?

3. What is the relationship between socio-demographic characteristics and infant and young child feeding practices in the northern regions of Ghana?

1.3 Context of the Study

The setting of the FTF-PBS was Brong Ahafo, Northern, Upper East, and Upper West regions of Ghana (Zereyesus et al., 2014). All the districts in Upper East, Upper West, and Northern regions were included in FTF-PBS. The FTF-PBS included only 7 out of 22 districts from the Brong Ahafo Region. The FTF-PBS called its study area Zone of Influence (Zereyesus et al., 2014). For the purposes of this study, the study area is hereafter called northern regions of Ghana. The context information on each of the regions is briefly presented on the following indicators: the land area, population, main economic activity, literacy rate, poverty, and Social vulnerability to climate change.

1.3.1 Northern Region

The estimated total land area of the northern region is 70,384 square kilometres (Samuel, Thomas, Christian, & Ezekiel, 2013). From the current Ghana population census, the estimated population of the northern region is 2,479,461(Samuel et al., 2013); the estimated population of females is 1,249,574 and that of males is 1,229,887 (Samuel et al., 2013). Agriculture is the predominant economic activity in the region (Samuel et al., 2013). The common crops produce in the region include the following: yam, maize, millet, guinea corn, rice, groundnuts, beans, soya beans and cowpea (Samuel et al., 2013). "About 19.2 percent are literate in English and a Ghanaian language, 16.3 percent in English only and 1.5 percent in a Ghanaian language only" (Samuel et al., 2013, p. 53). Literacy in the 2010 Ghana Census is defined as an individual's "ability to read and write in any language" (Samuel et al., 2013, p. 20). Results from the Ghana 2012 FTF-PBS indicated that the prevalence of poverty is 26.1% (Amanor-Boadu, Zereyesus, & Asiedu-Dartey, 2013). Per capita daily expenditure was used as a proxy metric for poverty in the Ghana 2012 FFF-PBS report, and the analysis relied on the World Bank's threshold of $1.25 to estimate both regional and district level poverty prevalence rates in the ZOI (Amanor-Boadu et al., 2013).

1.3.2 Upper East

The estimated total land area of Upper East region is 8,842 square kilometres. The region's estimated population is 1,046,545 (ZMK, Festus, & John, 2013). The main economic activities in the region are agriculture, hunting, and forestry (ZMK et al., 2013). The

commonly produce crops are “millet, guinea-corn, maize, groundnut, beans, sorghum and dry season tomatoes and onions”(ZMK et al., 2013, p. 4). About 48% of the population 11 years and above are literate (ZMK et al., 2013). “About one in three (32.0%) person is literate in English only and 14.0 percent is literate in English and a Ghanaian language and only 1.0 percent is literate in a Ghanaian language only” (ZMK et al., 2013, p. 65). The prevalence of poverty in upper east is 28.1% (Amanor-Boadu et al., 2013).

1.3.3 Upper West

The Upper West Region covered an estimated land area of 18,476 square kilometres (Jasper, Anthony, & Clara, 2013). The estimated population of Upper West is “702,110, with 48.6 percent (341,182) males and 51.4 percent (360,928) females”(Jasper et al., 2013, p. 4). The main economic activities in the region include: agriculture—including cattle rearing—spinning, weaving, smock designing, and musical instrument making—such as the xylophone (Jasper et al., 2013). Crops produce on both subsistence and commercial basis are: guinea corn, maize, millet, rice, soya beans, groundnuts, cotton, yam, cowpea, and sorghum (Jasper et al., 2013, p. 4). Literacy rate in Upper West is about 40% among 15years and older people (Jasper et al., 2013). “Less than one-fourth of the population were literate in English and a Ghanaian language while about 15 percent were literate in English language only” (Jasper et al., 2013, p. 51). The poverty prevalence, which is the highest among the northern regions of Ghana, is 34.6% (Amanor-Boadu et al., 2013).

1.3.4 Brong Ahafo

The estimated total land size of Brong Ahafo region is 39,554 square kilometres, with an estimated population of 2,310, 983(Martin, Omar, & Clara, 2013). However, only seven districts from Brong Ahafo region were included in the FTF-PBS study area (Zereyesus et al., 2014). The estimated population of the 7 districts in Brong Ahafo is 705,722 (Zereyesus et al., 2014). Agriculture is the main economic activity in Brong Ahafo region (Martin et al., 2013). About 70 percent of the Brong Ahafo population are literate (Martin et al., 2013), which is the highest among all the four northern regions of Ghana. The poverty prevalence in Brong Ahafo (calculated for only the seven districts in the ZOI) is 6.1% (Amanor-Boadu et al., 2013).

Almost all the districts within the study population (across the northern regions of Ghana) demonstrated high to highest social vulnerability to climate change (Stanturf et al., 2011). Social vulnerability to climate change is understood as an individual’s or social grouping’s

ability or inability to respond to, cope with, recover from or adapt to climate changes that are caused by both socioeconomic and biophysical factors (Stanturf et al., 2011, p. 118). Social vulnerability to climate change index was created from “11 indicators selected to serve as proxy measurements of social vulnerability to climate change” (Stanturf et al., 2011, p. 119). The 11 indicators include: dependent population, distance from food water, distance from food market, female headed households, unimproved drinking water source, malnourished children, poverty perception, ability to survive crisis, illiteracy, agriculture employment, and road access (Stanturf et al., 2011).

CHAPTER TWO
CONCEPTUAL FRAMEWORK AND REVIEW OF RELEVANT LITERATURE

2.0 Conceptual Framework

2.1 The Model of Childcare

The Model of Childcare (Amugsi, 2015; Matanda, 2015), adapted from UNICEF framework on causes of malnutrition by the Research Unit for Social Determinants of Health in Very Poor Ruralities, has served as both conceptual and analytical framework for the study (Figure 2.1). The model hypothesises that the health of children is determined by: first, child care practices, which are the immediate pathways to child health and development; second, resources for care (maternal resources, food security resources, infrastructure resources), which are the underlying household and community level determinants of childcare practices; third, contextual factors; and genes and happenstance. The Model of Childcare postulates that socio-economic and environmental determinants of health contribute to a child's health and wellbeing at the micro and macro levels of a child's development (Engle, Menon, & Haddad, 1999; Smith & Haddad, 2000a; UNICEF, 1990).

2.1.1 Child health and development

Child health and development is the ultimate outcome in the model. Child health and childcare practices are bi-directional; children who are inadequately fed or cared for may suffer from ill-health (Smith & Haddad, 2000b), or children who suffer from ill-health may receive more care (example feeding) or may lose appetite (Dewey, 2003), which may prevent them from feeding adequately. Empirically, acute respiratory infections, fever, and diarrhoea in children are both risk and resource factors in achieving recommended complementary feeding (Issaka et al., 2015a, 2015b; Senarath, Godakandage, Jayawickrama, Siriwardena, & Dibley, 2012).

2.1.2 Genes and Happenstance

Genes and happenstance (*a & d* arrows) in the model represents the uncontrollable determinants of Child health. The genes constitute the biological determinants of the health and wellbeing (Bortz, 2005). A typical example of a gene factor is a child born with sickle cell disease (hereditary blood disorder). The sickle cell disease in the child will directly affect the health of the child regardless of the socio-economic status of the parents or the socio-

demographic characteristics of the child. Happenstance in the model signifies occurrences such as natural disasters, wars, conflicts and accidents. Genes and happenstance have direct effect on a child health regardless of other resource factors in the model. Many studies have confirmed the direct impact of happenstance on the health of children (Akresh, Lucchetti, & Thirumurthy, 2012; Devakumar, Birch, Osrin, Sondorp, & Wells, 2014; Pearn, 2003; Qouta, Punamäki, & El Sarraj, 2008; Santa, 2006).

2.1.3 Childcare

Childcare in the model represents the immediate pathways (arrow *b*) to child health and development. childcare is defined as "the behaviours and practices of caregivers (mothers, siblings, fathers and childcare providers) that provide the food, health care, stimulation and emotional support necessary for children's healthy growth and development"(Engle, Bentley, & Pelto, 2000, p. 27). Inadequacy in any of the childcare practices in the model can lead to child malnutrition (UNICEF, 1990).

Dietary intake, complementary feeding, exclusive breastfeeding and breastfeeding during the first hour of birth have been found in many studies to have association with child's health (Amugsi, Mittelmark, Lartey, et al., 2014; Engle, 1999; Matanda, Mittelmark, & Kigaru, 2014). Other factors in the childcare resources component of the model include: home hygiene and health practices, psychosocial care (responsiveness; inclusion; provision of attention and affection), immunization, prevention, injury protection, effective symptom treatment, referral to healthcare.

Engle (1999) posits that psychosocial care (responsiveness; inclusion; provision of attention and affection) influences a child's survival, growth, and development. The childcare factors are in themselves interdependent, for "a child with inadequate dietary intake is more susceptible to disease. In turn, disease depresses appetite, inhibits the absorption of nutrients in food, and competes for a child's energy" (Smith & Haddad, 2000b, p. 4).

2.1.4 Resources for Child Care

Caregivers require sufficient resources in order to effectively provide childcare (Engle et al., 2000, p. 27). In the Model of Childcare, three childcare resources are emphasized as predictors of childcare and child health: food security resources, maternal resources, and infrastructural resources.

2.1.4.1 Food security resources

Food security resources are the underlying household and community level determinants of childcare practices that exert influence on child health and development through childcare (arrow ***e***). Food security resources is the first group of resources caregivers draw on to care for children. The prerequisite resources for attaining food security are area food availability, household food availability (self-production and purchase), household feeding priorities, and food aide. In the Peruvian Andes, for instance, caregivers' (women) access to food positively influences child feeding practices (Urke, Bull, & Mittelmark, 2013).

2.1.4.2 Maternal resources

Maternal resources are another set of prerequisite childcare resources. Maternal education, knowledge and belief, autonomy and health status are some of the maternal resources that have been established in literature as having significant relationship with the nutritional outcomes of children (Amugsi, Mittelmark, Lartey, et al., 2014; Saaka, 2014; Urke, Bull, & Mittelmark, 2011; Urke et al., 2013). A study conducted in Ghana found that there is a significant association between child nutritional status and maternal knowledge of childcare practices (Saaka & Osman, 2013).

Decision latitude or autonomy is one component of the maternal resources in the model. Empirically, the relationship between maternal decision latitude or autonomy and child feeding practices have been supported in many studies, especially in developing countries; an indication that women empowerment may translate into childcare practices (Beyene et al., 2015; Malapit & Quisumbing, 2015; Na, Jennings, Talegawkar, & Ahmed, 2015; Nguyen et al., 2013).

Maternal physical and mental health have been confirmed in many studies as predictors of adequate child feeding practices. The empirical findings suggest that mothers or primary caregivers who are in good health may have more time and the strength to utilize existing resources to provide care for children (Heidkamp et al., 2015; Issaka et al., 2015b; Patel et al., 2012; Senarath et al., 2012).

Another component of maternal resources in the model is knowledge and beliefs. These knowledge and beliefs may be acquired through formal or informal education. The hypothetical link between maternal knowledge and beliefs and child feeding practices have been supported in a lot of empirical studies in the Global South (Beyene et al., 2015; Issaka et

al., 2015a, 2015b; Joshi et al., 2012; Malhotra, 2013; Nguyen et al., 2013; Patel et al., 2012; Senarath et al., 2012; Urke et al., 2013; Victor et al., 2014).

The importance of supportive partners to mothers or primary caregivers in childcare have been hypothesised in the model. This hypothesis has been supported by studies in developing countries. Paternal education or employment status, an indicator of partner support, was a predictor of recommended child feeding practices (Bilal et al., 2015; Issaka et al., 2015a, 2015b; Victor et al., 2014).

2.1.4.3 Infrastructural resources

Infrastructural resources represent the third resource for childcare. Infrastructural resources rests on the availability of and accessibility to schools or educational institutions, sources of safe drinking water, proper sanitation facilities, and availability and accessibility to healthcare. In the model, these resources are prerequisite for childcare and child health and development.

In the empirical literature, the availability and accessibility of healthcare has increase the odds in providing good childcare practices. The antenatal and post-natal care received by mothers significantly related with child recommended feeding practices (Beyene et al., 2015; Issaka et al., 2015a, 2015b; Ogbo, Page, Idoko, Claudio, & Agho, 2015; Patel et al., 2012; Senarath et al., 2012; Victor et al., 2014).

An empirical finding from Ethiopia also indicated that children who were born through caesarean section were adequately fed compared to children who were born through non-caesarean (Issaka et al., 2015a), suggesting that mothers of such children have had access to modern healthcare facilities. Another study that confirms access to healthcare facility as a resource to child care indicated that children who were delivered in hospitals were more likely to have received adequate feeding compared to children who were delivered at home (Issaka et al., 2015a, 2015b).

Access to safe drinking water is one of the resource factors among the infrastructural resources in the model. In Niger for instance, an empirical study indicated that living in households with protected sources of drinking water was a resource factor for children in achieving recommendation for MAD (Issaka et al., 2015b).

2.1.5 Context

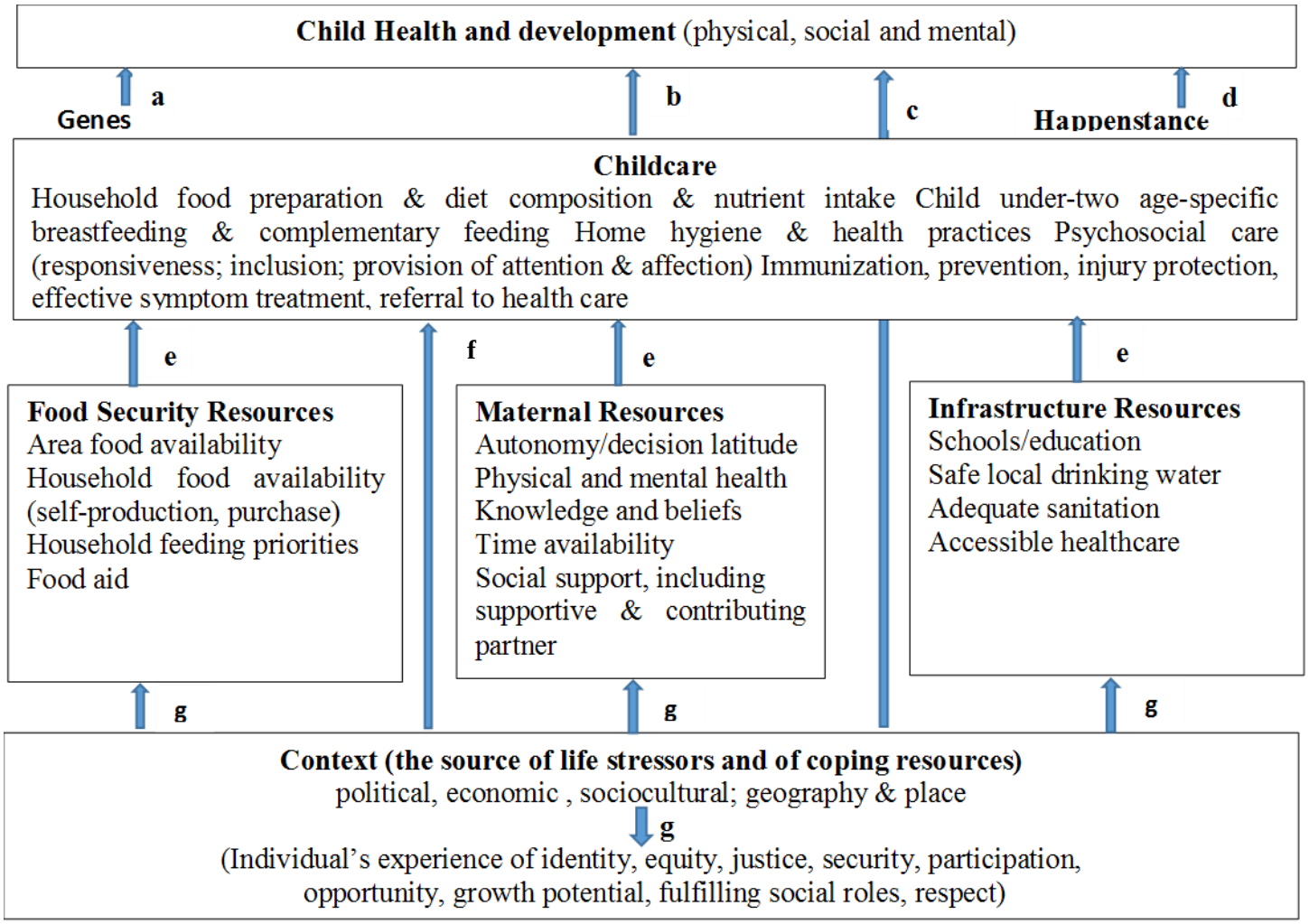
The contextual factors are broadly indicated as sources of life stressors and coping resources in the Model of Childcare. In the Model, context is the key underlying determinant of childcare resources, childcare and child health and development (f, g & c arrows). These underlying determinants, Smith and Haddad (2000a) posited, are a country's or a community's available potential resources that are determined by the natural environment, access to technology, and the quality of human resources. These potential resources are translated into childcare resources through the influence of a country's or a community's political, socio-economic, and cultural conditions. People's experiences of identity, equity, justice, security, participation, opportunity, growth potential, social roles and respect are also postulated as having contextual underpinnings (Matanda, 2015). These experiences are partly shaped by a country's or a community's political, socio-economic, and cultural conditions (Matanda, 2015).

A couple of studies have documented that there is a link between the residential province of caregivers with child health (Amugsi, Mittelmark, & Lartey, 2014; Matanda et al., 2014). In some empirical studies, household wealth was a significant predictor of child feeding practices (Issaka et al., 2015a, 2015b; Joshi et al., 2012; Kabir et al., 2012; Malhotra, 2013; Ng et al., 2012; Ogbo et al., 2015; Patel et al., 2012; Santika, Februhartanty, & Ariawan, 2015; Senarath et al., 2012; Subedi, Paudel, Rana, & Poudyal, 2012; Victor et al., 2014).

The Model of Childcare postulates that there is a correlation between contextual factors or socio-demographic characteristics and food security resources. Studies have noted the following socio-demographic characteristics as social determinants of food security: income (Kirkpatrick & Tarasuk, 2010; Ricciuto, Tarasuk, & Yatchew, 2006), poverty (Zakari, Ying, & Song, 2014), rental tenancy status (Loopstra & Tarasuk, 2013; Olabiyi & McIntyre, 2014), single-parent households (Olabiyi & McIntyre, 2014), sex of household head (Matheson & McIntyre, 2014; Zakari et al., 2014), large household size (Olabiyi & McIntyre, 2014; Ricciuto et al., 2006), lower educational attainment (Olabiyi & McIntyre, 2014; Ricciuto et al., 2006), employment (Loopstra & Tarasuk, 2013; McIntyre, Bartoo, & Emery, 2014) and households that receive welfare benefits (Loopstra & Tarasuk, 2013; Olabiyi & McIntyre, 2014), place of residence (Carter, Dubois, & Tremblay, 2014; Carter, Dubois, Tremblay, & Taljaard, 2012; Kirkpatrick & Tarasuk, 2010; Wiesmann, 2007), households in which there

was chronic disease (Olabiyi & McIntyre, 2014), and households within which smoking and gambling problems are present (Olabiyi & McIntyre, 2014).

Figure 2.1 Model of Childcare



Adapted by the Research Unit for Social Determinants of Health in Very Poor Ruralities (MB Mittelmark Director), University of Bergen Research Group *Multicultural Venues in Health, Gender and Social Justice* (http://www.uib.no/rg/mcvenues), from UNICEF, 1990; Engle, Menon and Haddad, 1999; Smith and Haddad, 2000.

2.2 Literature Review

2.2.0 Introduction

Relevant literature related to the variables used in the analysis were reviewed under three subheadings: food security resources, maternal resources, and context. These variables are: household food security, household production diversity, household dietary diversity, maternal dietary diversity, maternal age, maternal education, maternal English literacy, child sex, child age, locality of residence, region of residence, household size.

2.2.1 Food Security Resources

Few studies have explored the relationship between household food security indicators and complementary feeding practices of children. In the existing empirical studies, household production diversity, maternal dietary diversity, and duration of food sufficiency were used as household food security measures. In Nepal, a significant positive correlation was found between household production diversity and child dietary diversity (Malapit, Kadiyala, Quisumbing, Cunningham, & Tyagi, 2015). Duration of food sufficiency, although not sufficiently defined in this study, was found to be significantly positively related with feeding diverse complementary foods in Chepang community in Nepal (Subedi et al., 2012). Also, maternal dietary diversity was significantly positively associated with MDD in Vietnam (Nguyen et al., 2013), Ethiopia (Nguyen et al., 2013), Bangladesh (Nguyen et al., 2013), and Ghana (Amugsi, Mittelmark, & Oduro, 2015).

To the best of the researcher's knowledge, there is no literature on the relationship between household dietary diversity and achievement of recommended complementary feeding practices. Also, there is no literature on the link between household food security measures and achievement of recommended complementary feeding practices.

2.2.2 Maternal Resources

The maternal resource variables that are reviewed include maternal education, English literacy, and maternal age.

2.2.2.1 Maternal Education

The level of a mother's education is a determinant of achieving adequate MMF, MDD, and MAD diet among infant and young children in many resource poor settings. Studies documented the significance of maternal education in certain South and East Asian countries.

In Indonesia (Ng et al., 2012), India (Malhotra, 2013), Bangladesh (Kabir et al., 2012), and Nepal (Joshi et al., 2012), children of mothers with some form of formal education were significantly more likely to receive MMF. In Sri Lanka (Senarath et al., 2012), Indonesia (Ng et al., 2012), India (Malhotra, 2013; Patel et al., 2012), and Bangladesh (Kabir et al., 2012), maternal education increases the odds for children to achieve the recommended MDD. In Sri Lanka (Senarath et al., 2012), Indonesia (Ng et al., 2012), India (Patel et al., 2012), Nepal (Joshi et al., 2012), and Bangladesh (Kabir et al., 2012), maternal education increases the odds for infants and children to receive recommended MAD.

Similarly, maternal education is a significant determinant of complementary feeding practices in sub Saharan African countries. Maternal education increases the odds for achieving MMF among children in Liberia (Issaka et al., 2015a). In Ethiopia (Beyene et al., 2015), Nigeria (Issaka et al., 2015a; Ogbo et al., 2015), Cote d'Ivoire (Issaka et al., 2015b), Guinea (Issaka et al., 2015b), Mali (Issaka et al., 2015b), Niger (Issaka et al., 2015b), Tanzania (Victor et al., 2014), and Senegal (Issaka et al., 2015b), mother's education was a protective factor against giving children inadequate recommended dietary diversity. Maternal education also increases the odds for children to achieve MAD in Nigeria (Issaka et al., 2015a; Ogbo et al., 2015), Burkina Faso (Issaka et al., 2015b), Niger (Issaka et al., 2015b), and Liberia (Issaka et al., 2015a). However, maternal education was not significantly associated with any of the complementary feeding practices in Uganda (Ickes, Hurst, & Flax, 2015).

There was dearth of literature on the relationship between maternal age and maternal English literacy and achievement of recommended complementary feeding practices.

2.2.3 Context

Literature on the following context variables are reported: sex of child, age of child, region of residence and locality of residence, and household size.

2.2.3.1 Child Sex

There was paucity of literature on the link between child sex and complementary feeding—MMF, MDD, and MAD. In Nigeria, girls were at better odds of achieving MAD than boys (Issaka et al., 2015a). Early initiation of complementary feeding is closely related to the complementary feeding indicators used in the study. Child sex was found to be a significant determinant of early initiation of complementary feeding and nutritional status in Ethiopia (Semahegn et al., 2014), Kenya (Kimani-Murage et al., 2011), Senegal (Issaka et al., 2015b),

and Ghana (Amugsi et al., 2013). Boy children in Ethiopia (Semahegn et al., 2014) and Kenya (Kimani-Murage et al., 2011) were at better odds in achieving the timely introduction of complementary feeding than girl children. In contrast, girls in Senegal were at better odds in achieving the timely introduction of complementary feeding than boys (Issaka et al., 2015b). In a trend analysis of DHS (1993, 1998, 2003 and 2008) data, it was observed that a decline in stunting and wasting trends were significant among boys but not among girl children in Ghana (Amugsi et al., 2013).

2.2.3.2 Age of Child

Compared to 6-11 months, children aged 12-23 months were more likely to achieve MMF in Indonesia (Ng et al., 2012), Nepal (Joshi et al., 2012), Benin (Issaka et al., 2015b), Burkina Faso (Issaka et al., 2015b), Mali (Issaka et al., 2015b), Tanzania (Victor et al., 2014), Ethiopia (Beyene et al., 2015), and Niger (Issaka et al., 2015b). In contrast, children within the youngest age group (6-11 months) were more likely to achieve MMF in Haiti (Heidkamp et al., 2015), Serra Leone (Issaka et al., 2015a) and Nigeria (Issaka et al., 2015a).

Achievement of MDD was observed among 12-23 months old children in Vietnam (Nguyen et al., 2013), Bangladesh (Kabir et al., 2012), Indonesia (Ng et al., 2012), Ethiopia (Beyene et al., 2015; Nguyen et al., 2013), Benin (Issaka et al., 2015b), Burkina Faso (Issaka et al., 2015b), Cote d'Ivoire (Issaka et al., 2015b), Guinea (Issaka et al., 2015b), Mali (Issaka et al., 2015b), Niger (Issaka et al., 2015b), Senegal (Issaka et al., 2015b), Tanzania (Victor et al., 2014), Ghana (Issaka et al., 2015a), Nigeria (Issaka et al., 2015a), Liberia (Issaka et al., 2015a), Serra Leone (Issaka et al., 2015a), and in poor counties of Gansu Province in China (Wang et al., 2011).

Also, older children (12-23 months) were more likely to achieve MAD in Indonesian(Ng et al., 2012), Nepal (Joshi et al., 2012), Tanzania (Victor et al., 2014), Benin (Issaka et al., 2015b), Burkina Faso (Issaka et al., 2015b), Guinea (Issaka et al., 2015b), Niger (Issaka et al., 2015b) and Senegal (Issaka et al., 2015b). In contrast, Ghanaian and Nigerian children within the oldest age group were at risk of receiving the required MAD (Issaka et al., 2015a).

2.2.3.3 Region and Locality of Residence

In sub Saharan Africa and South and East Asian countries, children in socio-economically advantaged regions and urban areas were more likely to receive recommended complementary feeding (Beyene et al., 2015; Issaka et al., 2015a, 2015b; Kabir et al., 2012;

Ng et al., 2012; Patel et al., 2012; Senarath et al., 2012). For example, Ethiopian children of mothers who resided in urban areas and had home gardens were more likely to receive MDD (Beyene et al., 2015). Also, in Ghana, compared with the Volta region, children were at risk of receiving MMF in the Central, the Greater Accra, the Western, the Eastern, the Ashanti, Brong Ahafo, the Northern, the Upper East and the Upper West regions (Issaka et al., 2015a). Also, children who were in Northern region were at risk of not receiving MDD in Ghana (Issaka et al., 2015a). Except Volta and Greater Accra regions, children in the remaining regions of Ghana were at risk of not receiving MAD (Issaka et al., 2015a).

2.2.3.4 Household Size

There is no literature on the relationship between household size and child complementary feeding practices. Household size connotes the number of members living in a particular household. Household size may either demonstrate protective effect against inadequate complementary feeding or increased the odds in adequate complementary feeding practices. The protective effects may happen if support from members of the household translate into adequate feeding practices among children, and it may increase the odds in inadequate complementary feeding if siblings or children of other household members limit children's access to food and care.

2.3 Methodological reflections of the reviewed literature

In all the empirical studies reviewed, most of the authors did not report how missing cases or data were handled in their analysis; this may create a false impression that the data collection and entry process were perfect. The cross-sectional designs approach of all the studies reviewed implies that causality cannot be inferred. Also, secondary data were used in most of the empirical studies that were reviewed. These data were collected by trusted and well-equipped organizations. An example of such organization is the Demographic Health Surveys (DHS). Demographic Health Survey data, for example, were used in most of the articles that were reviewed. The nationally and regionally representativeness of the secondary data make the generalization and the comparability of the results reliable. In most of the studies, the authors operationalized the complementary feeding indicators—MMF, MDD, and MAD—in accordance with the WHO Infant and young child feeding indicators. Therefore, the findings in their studies were easy to be compared with the results of the present study.

CHAPTER THREE
METHODOLOGY

3.0 Data and Methods

The methodology chapter addressed the following: study design, data collection methods, data management methods, participants, measures, data analysis methods, interpretation methods, missing data and ethical considerations.

3.1 Study Design

This study is a secondary data analysis of the Ghana 2012 Feed the Future Population Baseline Survey (FTF-PBS). Secondary data analysis, according to Boslaugh (2007, p. ix), is "the analysis of data collected by someone else." Usually, the person using the data for analysis did not participate in the collection of the data (Boslaugh, 2007). As a result, the purpose of the primary data collectors might be different from the researcher who is using the data for a secondary analysis (Boslaugh, 2007).

Due to limited time and inadequate resources at hand to collect data on the regions in northern Ghana, the researcher opted for the 2012 FTF-PBS data (Johnston, 2014). The 2012 Ghana FTF-PBS is part of U.S. Government's global hunger and food security project. Other countries where the FTF-PBS has been carried out are: Bangladesh, Cambodia, Ethiopia, Guatemala, Haiti, Honduras, Kenya, Liberia, Malawi, Mali, Mozambique, Nepal, Rwanda, Senegal, Tajikistan, Tanzania, Uganda and Zambia (FTF, 2010). The research expertise of the data collection agents and institutions (mentioned under the data collection method section) justified the use of the data, for the data was deemed to be of high quality (Johnston, 2014). The researcher only devoted time in cleaning the dataset for analysis.

3.2 Data Collection Methods

The 2012 Ghana FTF-PBS was carried out by three main institutions: the Monitoring, Evaluation and Technical Support Services (METSS) staff in Ghana and the U.S; the Institute of Statistical, Social and Economic Research (ISSER), University of Ghana; Bureau of Food Security, Washington, DC; and the Ghana Statistical Service (GSS) (Zereyesus et al., 2014).

The FTF-PBS data was collected on three regions in the northern part of Ghana and seven out of twenty-two districts from the Brong Ahafo region. In all, 45 districts were surveyed: 7 northernmost districts from the Brong Ahafo region and all districts in the three Northern

regions of Ghana (Upper East, Upper West and Northern Region). All the forty-five districts constitute the Zone of Influence in Ghana (Zereyesus et al., 2014).

The FTF-PBS employed two-staged probability sampling method in order to select a representative sample size of districts within the Zone of Influence. Firstly, 230 enumeration areas (EA) were selected by the Ghana Statistical Service (GSS) based on the 2010 Ghana Census Data. Secondly, 4600 households were selected from the 230 EAs sampled during the first stage probability sampling by selecting 20 households from each EA (Zereyesus et al., 2014). The data collection was done by 82 trained enumerators. The data collection occurred from 1st of July, 2012 and 17th August, 2012 (Zereyesus et al., 2014). Computer-Assisted Personal Interview (CAPI) was the main data collection approach used for the 2012 FTF-PBS. In some few instances, paper-based questionnaires were used (Zereyesus et al., 2014). The enumerators were unable to survey one EA as a result of inaccessibility of road to the EA due to flood. Out of the 4600 households sampled, 4410 were surveyed accounting for a 95.9 percent completion rate (Zereyesus et al., 2014).

3.3 Data Management Methods (Quality Assurance)

The 2012 FTF-PBS project team ensured that the data collected were well managed through a data transfer and quality management assurance protocols (Zereyesus et al., 2014). First of all, enumerators submitted their data collection computers to their supervisors daily (Zereyesus et al., 2014). The supervisors consolidated the data and check for errors. After checking and correcting errors, the supervisors transferred the data to database systems at ISSER, METSS and Kansas State University (Zereyesus et al., 2014). This quality assurance process was done on daily basis till the end of the survey in order to guarantee data quality (Zereyesus et al., 2014). The entire survey data was finally saved in excel csv file format and made public for research purposes (Zereyesus et al., 2014).

3.4 Participants

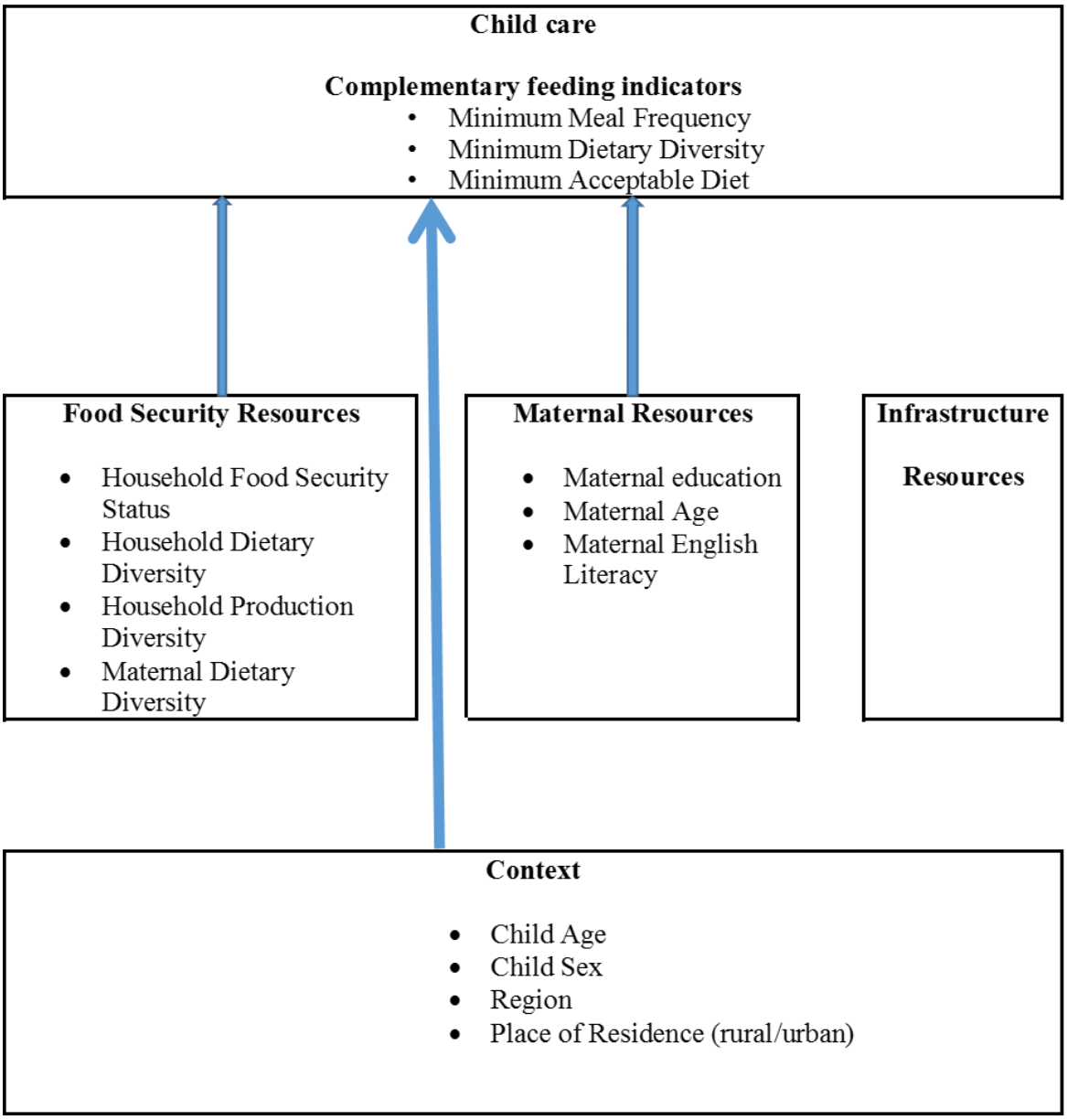
The sample size of the study is 871 children between 6-23 months old from 825 households. The study sample is a subsample from the main data-set containing 24,860 participants—both adults and children—from 4,410 households. The estimated sample size for 6-23 months old infants and children was 946, but the actual number of infants and children on whom data was gathered was 871 accounting for a 92.1% response rate (Zereyesus et al., 2014). Participants in the FTF-PBS were interviewed about the following: household identification, dwelling

characteristics, household hunger scale (conditions), cultivation of key crops, food consumption expenditure, non-food consumption, other non-food consumption, housing expenditure, durable goods expenditure, women empowerment in agriculture index, women dietary diversity, children minimum acceptable diet, and exclusive breastfeeding. In addition, anthropometric measurements of length or height and weight were taken from women and children.

3.5 Measures

The outcome measures in this study include minimum dietary diversity (MDD), minimum meal frequency (MMF) and minimum acceptable diet (MAD). The main predictor variable is household hunger scale (HHS) measuring household food security status. Other main household food security measures include household dietary diversity, household production diversity, and maternal dietary diversity. Socio-demographic predictor variables in the study includes maternal education, maternal literacy, child sex, child age, place of residence, region of residence, and household size. The term predictor variable(s) is used in this thesis in a purely statistical sense, referring to variables entered in regression analysis as one or more ‘x’ variables (predictors) in an equation predicting a ‘y’ variable.

Figure 3.1 Analytical model showing the outcome and predictor measures



3.5.1 Outcome Measures

3.5.1.1 Minimum Meal Frequency

MMF is defined as the "proportion of breastfed and non-breastfed children 6–23 months of age who receive solid, semi-solid, or soft foods (but also including milk feeds for non-breastfed children) the minimum number of times or more" in the past 24 hours (WHO, 2010b, p. 36). The variables used in creating the MMF composite score includes the age of the child (6-23 months), the breastfeeding status of the child 24-hours prior to data collection, the number of times the child consume any milk 24-hours prior to data collection, the number

of times the child consume any yogurt 24-hours prior to data collection, and the number of times the child consumed solid, semi-solid, or soft foods other than liquids 24-hours prior to data collection. Children who achieved MMF were scored a '0', and those who did not achieve the MMF were scored a '1'.

3.5.1.2 Minimum Dietary Diversity

MDD is defined as the "proportion of children 6–23 months of age who receive foods from 4 or more food groups" in the past 24 hours (WHO, 2010b, p. 35). In order to create the MDD variable, seven food group (see table 3.1) score variables were created from the following food groups: grains, roots and tubers; legumes and nuts; dairy products (milk, yogurt, cheese); flesh foods (meat, fish, poultry and liver/organ meats); eggs; vitamin-A rich fruits and vegetables; and other fruits and vegetables (WHO, 2010b). A 24-hour recall on food items given to children by mothers was used in generating the seven food groups. The MDD composite score was created from the child age (6-23 months) and the seven food score variables. Children who achieved MDD were scored a '0', and those who did not achieve the MDD were scored a '1'.

Table 3.1 The Seven Food Groups

	Food Group	**Food items**
1	Grains, roots and tubers	Thin porridge, bread, rice, noodles, porridge or other foods made from grains (kenkey, banku, koko, tuo zaafi, akple), white potatoes, white yams, manioc, cassava, cocoyam, fufu or any other foods made from roots, tubers or plantain.
2	Legumes and nuts	Any foods made from beans, peas, lentils, nuts, or seeds
3	Dairy products (milk, yogurt, cheese) NB: Included for non-breastfed children	Infant formula such as winning mix or commercially produced infant formula, milk such as tinned, powdered, or fresh animal milk, yogurt, cheese, or other milk products.

4	Flesh foods (meat, fish, poultry and liver/organ meats)	Any meat, such as beef, pork, lamb, goat, chicken, or duck, fresh or dried fish or shellfish [e.g. prawn, lobster]
5	Eggs	Eggs
6	Vitamin-A rich fruits and vegetables	Pumpkin, red or yellow yams, carrots, sweet potatoes that are yellow or orange inside, any dark green, leafy vegetables (kontomire, aleefu, ayoyo, kale, cassava leaves), ripe mangoes, pawpaw, foods made with red palm oil, red palm nut, or red palm nut pulp sauce
7	Other fruits and vegetables	Any other fruits or vegetables [e.g. bananas, avocados, tomatoes, oranges, apples]

3.5.1.3 Minimum Acceptable Diet

Minimum Acceptable Diet (MAD) is defined as "proportion of children 6–23 months of age who receive both minimum dietary diversity and minimum meal frequency" in the past 24 hours (WHO, 2010b, p. 37). The MAD composite score was created by summing up the MMF and MDD scores of each child. Children who achieved MAD were scored a '0', and those who did not achieve the MAD were scored a '1'.

3.5.2 Predictor Variables

3.5.2.1 Household Hunger Scale (main household food security variable)

The household security status was measured by Household Hunger Scale (HHS) at the time of the survey with three levels of measurement: little to no hunger in the household, moderate hunger, and severe hunger in the household. In this study, two levels of measurement were created from the original three levels of measurement of HHS as follows because only 6 children were found in the severe hunger households: food secure household (no hunger in the household) and food insecure household (moderate to severe hunger in the household). The HHS indicator measures the unavailability of and inaccessibility to food security resources (Ballard et al., 2011). In order to determine the household food insecurity condition, the head of households were asked series of questions about food accessibility and the frequency of food insecure situations over one month recall period at the time of the survey (displayed in

table 3.2) (Zereyesus et al., 2014). Households with more frequent occurrences of food insecure conditions were considered moderate to severe hunger (food insecurity) households, and households with less frequent or no occurrences of food insecure conditions were considered little to no hunger households.

Table 3.2 Household Hunger Scale Questions

No.	Questions	Response options
Q1	In the past [4 weeks/30 days], was there ever no food to eat of any kind in your house because of lack of resources to get food?	No= 0 (skip to Q2) Yes= 1
Q1a	How often did this happen in the past [4 weeks/30 days]?	Rarely (1-2 times) Sometimes (3-10 times) Often (more than 10 times)
Q2	In the past [4 weeks/30 days], did you or any household member go to sleep at night hungry because there was not enough food?	No= 0 (skip to Q3) Yes= 1
Q2a	How often did this happen in the past [4 weeks/30 days]?	Rarely (1-2 times) Sometimes (3-10 times) Often (more than 10 times)
Q3	In the past [4 weeks/30 days], did you or any household member go a whole day and night without eating anything at all because there was not enough food?	No= 0 (skip Q3a) Yes= 1
Q3a	How often did this happen in the past [4 weeks/30 days]?	Rarely (1-2 times) Sometimes (3-10 times) Often (more than 10 times)

Three new variables were created by merging each main question with its sub-question. Each of these three variables have 4 response options with their corresponding values as follows: 'NO'=0, 'Rarely'=1, 'Sometimes'=1, and 'Often'=2 (Ballard et al., 2011). The Values of the three new variables were summed up in order to create the Household Hunger Scale Score, which ranged between 0 and 6 (Ballard et al., 2011). Therefore, households that get a score of '0-1' are termed as little to no hunger household, a score of '2-3' are termed as moderate hunger household, and a score of '4-6' are termed as 'severe hunger household' (Ballard et al., 2011).

3.5.2.2 Maternal Dietary diversity

Maternal dietary diversity score was created using the 24-hour recall of mother's consumption of foods from nine food groups: starchy staples (both cereal products and tubers, roots etc); dark green leafy vegetables; other vitamin A rich fruits and vegetables; other fruits and vegetables; organ meat; Meat and fish; eggs; Legumes, nuts and seeds; and milk and milk products (Kennedy, Ballard, & Dop, 2011). Maternal dietary diversity is treated in this study as a continuous variable. A score of '0' means no maternal dietary diversity, and a score of '9' means the highest maternal dietary diversity.

Table 3.3 The nine food groups used to create the maternal dietary diversity

No.	Food Groups	Food items
1	Starchy staples	Bread, rice, noodles, or other foods made from grains (kenkey, banku, koko, tuo zaafi, akple, weanimix), white potatoes, white yams, manioc, cassava, cocoyam, fufu or any other foods made from roots, tubers or plantain,
2	Dark green leafy vegetables	Pumpkin, red or yellow yams, carrots, sweet potatoes that are yellow or orange inside, Any dark green, leafy vegetables (kontomire, aleefu, ayoyo, kale, cassava leaves)
3	Other vitamin A rich fruits and vegetables	Any other fruits or vegetables [e.g. bananas, avocados, tomatoes, oranges, apples], foods made with red palm oil, red palm nut, or red palm nut pulp sauce
4	Other fruits and vegetables	Ripe mangoes, pawpaw
5	Organ meat	Liver, kidney, heart or other organ meats
6	Meat and fish	Any meat, such as beef, pork, lamb, goat, chicken, or duck, fresh or dried fish or shellfish [e.g. prawn, lobster]
7	Eggs	Eggs
8	Legumes, nuts and seeds	Any foods made from beans, peas, lentils, nuts, or seeds
9	Milk and milk products	Milk such as tinned, powdered, or fresh animal milk, yogurt, cheese, or other milk products

3.5.2.3 Household Production Diversity

Household production diversity indicator (continuous variable) is defined as the number of food groups produced by the household from the household dietary consumption data, parallel to the nine food groups (except organ meat) used for creating the maternal dietary diversity. Answers to the question, "How much came from own production?" were used to determine which households produce any of the food items consumed in the household dietary consumption data. Households that indicated any value greater than zero were assumed to have produced the food. Household production diversity composite score was created from the scores from each of the eight food groups. The assumption was that household production diversity will demonstrate a protective effect against inadequate complementary feeding among children in northern region. Household production diversity is treated in this study as a continuous variable. A score of '0' means no household production diversity, and a score of '8' means the highest household production diversity.

3.5.2.4 Household Dietary Diversity

Household dietary diversity (continuous variable) is defined as the count of food groups consumed using the 7-day recall of household food consumption data. The household dietary diversity was created from 12 food groups: cereals; white tubers and roots; vegetables; fruits; meat; eggs; fish and other seafood; legumes and nuts; milk and milk products; oils and fats; sweets; and spices, condiments, and beverages (Kennedy et al., 2011). Household dietary diversity is treated in this study as a continuous variable. A score of '0' means no household dietary diversity, and a score of '12' means the highest household dietary diversity.

Table 3.4 The twelve food groups used to create household dietary diversity

No.	Food groups	Food items
1	Cereals	Maize normal flour, maize dough, green maize (fresh green cob), rice (paddy, grain), sorghum or guinea corn, millet grain, millet flour, other grains, bread, biscuit, spaghetti/ macaroni, breakfast cereal, infant feeding cereal
2	White tubers and roots	Cassava tubers, cassava gari, cassava flour, cassava other forms, yam, cocoyam, plantain, potatoes (sweet or other potatoes)
3	Vegetables	Onions, tomatoes, carrots, cabbage/lettuce, okro, garden eggs/egg plants, pepper, nkotonmire, cucumber, pumpkin, mushroom, green leafy vegetables, wild green leaves
4	Fruits	Mangoes, bananas, citrus (oranges, tangerine, etc.), pineapple, pawpaw, guava, avocado Pears, water melon, apple, wild fruit (shea, dawadawa, etc.), and other fruits
5	Meat	Beef, goat, pork, mutton, chicken, other poultry - guinea fowl, doves, small animal- rabbit, squirrels, etc, wild game, game birds, snail, tinned meat or fish
6	Eggs	Eggs
7	Fish and other seafood	Fresh fish and shellfish, fried fish, smoked fish
8	Legumes and nuts	Bambara beans, cowpea, pigeon pea, groundnut (roasted or raw), soya beans, other legumes and pulses, palm nuts, coconuts, other nuts

9	Milk and milk products	Fresh milk, other milk (powdered, sourced etc), margarine /butter, yoghurt, cheese, infant feeding formula (for bottle)
10	Oils and fats	Palm oil , palm kernel oil
11	Sweets	Honey, jam, jelly, sweets, candy, chocolates, sugar, sugar cane
12	Spices, condiments, and beverages	Tea, coffee, cocoa, milo, chocolim etc, fruit juice, freezes (flavoured ice), non-alcoholic beverages, alcoholic beverages, bottled water, salt, spices, sauces (tomato, soy, Neri etc)

3.5.2.5 Socio-demographic predictor variables

Table 3.5 presents how the socio-demographic variables were created and coded for the analysis.

Table 3.5 Socio-demographic predictor variables

Variables	Response options	Recoded [value]
Maternal education	No education	Uneducated [1]
	Middle School Level Certificate	Educated [0]
	Basic Education Certificate Exam	
	Teacher Training Certificate A	
	SSCE/WASSCE	
	Technical/Professional Diploma	
	Higher National Diploma	
	Other	Other [2]
Maternal English literacy	Cannot Read and Write English	Illiterate [1]
	Can write English Only	Literate [0]
	Can Read English only	
	Can read and write English	
Marital Status	Never married/Single	Never Married [1]
	Informal/consensual	Ever Married [0]
	Married	
	Separated	
	Divorced	
	Widowed	
Religion	Catholic	
	Protestant (Anglican, Lutheran, Presbyterian, Methodist, etc)	

	Pentecostal/Charismatic	Christian [1]
	Other Christian	
	Islam	Islam [0]
	Ahmadi	
	Traditionalist	Others [2]
	No Religion	
	Other	
Child sex	Boy	Girl [0]
	Girl	Boy [1]
Child age	6-11 months	6-11 [0]
	12-17 months	12-17 [1]
	18-23 months	18-23 [2]
Place of residence	Urban	
	Rural	
Region of residence	Brong Ahafo	Brong Ahafo [0]
	Northern	Northern [1]
	Upper East	Upper East [2]
	Upper West	Upper West [3]
Household size	Continuous variable	
Ethnicity	Akan	Southern Ghana Ethnic origin [1]
	Ga-Dangme	
	Ewe	

	Guan	
	Mole-Dagbani	Northern Ghana ethnic origin [0]
	Grussi	
	Mande	
	Gurma	
	Other	Other [2]

3.6 Data Analysis Methods

IBM's Statistical Package for Social Sciences (SPSS) version 22 was used to do the statistical analyses. Univariate statistical analyses were done on all the infant feeding practices indicators—MMF, MDD, and MAD—and the main predictor variable—household food security—and other predictors—socio-demographic characteristics. Bivariate statistical analyses were carried out among the predictor variables to check for multicollinearity. The researcher also checked for outliers. Finally, multiple logistic regression modelling was performed.

3.7 Interpretation Methods

Statistical tables and figures have been provided to help interpret univariate, bivariate and multivariate analysis of the variables in the study. Results from bivariate and multivariate analysis were significant at a p-value of 0.05. Since the study employed multiple logistic regression modelling, the 95% confidence intervals (CI) for Odds Ratio (O.R) for all the variables in the model were reported.

3.7.1 How variables were coded and entered into the logistic regression models and how the ORs were interpreted

Due to the resource perspective of the conceptual framework of the study, coding of the outcome variables were done in order to determine protective factors (among the predictor variables) against inadequate child complementary feeding. For the child complementary feeding indicators, infants and children who achieved MMF, MDD, MAD were scored a '0' and infants and children who did not achieve MMF, MDD, and MAD were scored a '1'. Twelve predictor variables were entered into each logistic regression model. With regard to other categorical variables in the logistic regression models, all the reference groups were

scored a ‘0’ and the non-reference groups were scored in the following sequence: ‘1’, ‘2’, ‘3’, etcetera.

Based on the above coding parameters of outcome measures, infants and children in the category with a negative B value (-B) in the logistic regression models suggest that they are more likely to be protected against inadequate complementary feeding or more likely to have achieved adequate recommended complementary feeding. In instances where predictor variables with a negative B value were statistically significant, the odds ratio (OR) were interpreted as follows:

1. OR > 1: the predictor variable increased odds of inadequate MMF, MDD, and MAD among infants and children, or the association[1] means that infants and children were less likely to achieve MMF, MDD, and MAD
2. OR < 1: the predictor variable decreased odds of inadequate MMF, MDD, and MAD among infants and children, or protective effects against inadequate MMF, MDD, and MAD among infants and children. In other words, the association means that infants and children were more likely to achieve MMF, MDD, and MAD.
3. OR = 1: no association between predictor variable and the particular measure of child complementary feeding

For the continuous predictor measures, a negative B value (-B) means that a unit increase of a predictor measure suggests a decrease in the likelihood of an infant or a child not receiving adequate recommended complementary feeding. In contrast, a positive B value (+B) means that a unit increase of a predictor measure suggests an increase in the likelihood of an infant or a child not achieving adequate recommended complementary feeding. In instances where the continuous predictor measures with a negative B value were statistically significant, the odds ratio (OR) were interpreted as stated above.

3.8 Missing data

Research that involved collection of data from humans hardly produce complete data from every respondent or participant. Thus, there is a possibility that there will be a missing data on some cases during the data collection process (Pallant, 2013). During statistical analysis, options exist on how to handle missing data. The common options are: the excluded cases

[1] Here, association means the importance of the predictor measure in relation with child complementary feeding measures.

listwise, the excluded cases pairwise, and replace with mean (Pallant, 2013). In this study, cases were excluded pairwise. The excluded cases pairwise excludes a case from an analysis only if the data that is required for a specific analysis is missing (Pallant, 2013), and cases were included in the analysis for which they (cases) have the necessary data (Pallant, 2013, p. 60).

3.8.1 Reports and reflection on missing cases in the logistic regression analyses

The number of cases included in the logistic regression model for MMF is 820 (94.1%) out of 871 cases, and the number of missing cases were 51 (5.9%). For the MDD and MAD models, 828 (95.1%) out of 871 cases were included in the analyses, and the number of missing cases were 43 (4.9%).

Although there are no established cut off point of the percentage of missing cases that are acceptable in a statistical analysis, two scholars noted that a cut of point of 10% missing cases or less is less likely to affect statistical inference (Bennett, 2001; Schafer, 1999). Missing cases in each of the three logistic regression models were less than 10%. Therefore, the number of missing data in the analysis was not disturbingly high to have drastically influenced the results of the study.

3.9 Ethical Considerations

This section explains the ethical issues that were addressed and those that were not mentioned in the FTF-PBS study protocols.

Ethical considerations were integral to the 2012 FTF-PBS project. The 82 enumerators were trained to receive consent from potential interviewees in each households within the 230 enumeration areas prior to the interview (Zereyesus et al., 2014). Respondents who could not express themselves in the English language were offered with consent forms in their native language. In order to keep track of interviewees who consented to be part of the survey, interviewees were asked to provide their thumb prints on the consent form. These forms were collected and filed at the METSS-Ghana office (Zereyesus et al., 2014).

The data collection agents were coached as to what to say and do in order to get people to participate in the survey. Some of what the data collection agents were asked to say in order to get the consent from the participants may infringe on respondent's right of voluntary participation. For example, in the enumerator's manual, enumerators were asked to say that

i. You are conducting a survey of Ghanaian and non-diplomatic households living in Ghana, and that the purpose is to find out about the present patterns of household consumption and expenditure, employment, living conditions, diet and nutritional status in some parts of the country. The survey is thus very important for planners to know how to improve the quality of people's living standards.
ii. The communities and the households that will be interviewed have been randomly selected. Other neighbouring communities and households have been selected in the same way.
iii. The survey is not concerned in any way with taxes, and all the information recorded will be regarded as confidential and covered by the obligation of statistical secrecy.
iv. You must further explain that the information obtained would be used to inform the implementation programmes and strategies of the FTF programme for which they **COULD** end up as beneficiaries (ISSER, 2012, p. 5)

In the fourth point, an enumerator is supposed to emphasize the benefits a respondent is likely to receive from participating in the survey. The promise of participation benefits may motivate most of the respondents, which may even influence responses.

Another ethical issue that has been partly addressed by the FTF-PBS is how the enumerators were to respond to severely acutely malnourished children during the data collection process (ISSER, 2012, p. 7). The enumerator's manual stated that "enumerators have a moral responsibility to advice the household of a child with this condition to take the child to the nearest health facility for attention"(ISSER, 2012, p. 7). The enumerator is not ethically bound if attending to a malnourished child in a household is a moral responsibility. What will happen should an enumerator overlook the health needs of the malnourished child and only take anthropometric measurement? It is not clear from the manual about what will happen when an enumerator overlooked such children during the research process.

Moreover, the compensation of the time respondents spend in participating in the research is another ethical concern. In all, an enumerator is duty bound to complete 11 modules (questionnaires covering different aspects of the survey). This required a lot of time sacrifice on the part of the respondent. However, nowhere in the FTF-PBS protocols has the issue of compensation of respondent's time been addressed.

Having carefully studied the modules, the modules on child, women, and adult health has same questions compared to the demographic and health surveys in Ghana. In order to save time, avoid duplication of efforts and responses, and a response burden on respondents, it will be ethically good if such health related survey data are shared among research institutions.

CHAPTER FOUR
RESULTS

4.0 Introduction

Preliminary descriptive and bivariate analysis were performed with the full sample. Informed by the preliminary results, the descriptive and bivariate analysis were stratified according to child sex (girls and boys) and child age (6-11 months, 12-17 months, and 18-23 months). Finally, logistic regression analyses were performed with the full sample.

4.1 Characteristics of the Sample

The boys (50.6) and girls (49.4%) samples were relatively equal in size (Table 4.2). The number of 12-17 months old children (41.9%) were more than 6-11 month old infants (36.2%) and 18-23 month old children (21.9%) (Table 2). 49.1% of children have achieved MMF, 30.8% have achieved MDD, and [2]16.6% of the children have achieved MAD (Table 4.1). Majority of the study population (63.9%) were found in little to no hunger households (Table 4.1).

[34] Table 4.1 Descriptive statistics of outcome and main predictor variables

	N (%)
Outcome Variables	
Minimum Meal Frequency	
Yes	423 (49.1)
No	438 (50.9)
Missing	10
Minimum Dietary Diversity	
Yes	268 (30.8)
No	603 (69.2)
Minimum Acceptable Diet	
Yes	145 (16.6)
No	726 (83.4)
Main Predictor variable	
Household Hunger Scale	
Little to no hunger (food secure)	555 (63.9)
Moderate hunger (food insecure)	309 (35.6)
Severe hunger (food insecure)	5 (0.6)
Missing	2

[2] The minimum acceptable diet prevalence in this study is a bit different from what is reported in the FTF-PBS report. The possible reasons for this variation are: the analysis in the report were weighted, and MAD in this study is calculated by summing MMF and MDD.
[3] Only valid percentages have been reported in Table 1 and other tables in results chapter (excluding missing).
[4] Table 4.1, 4.2, 4.3, 4.4, 4.5, 4.19, 4.20, and 4.21 presents study results with the full sample.

Table 4.2 Contextual and Resource Variables

	N (%)	Mean	SD
Maternal Resources			
Maternal/guardian Education			
Educated	66 (7.6)		
Uneducated	805 (92.4)		
English Literacy			
Literate	93 (89.1)		
Illiterate	763 (10.9)		
Missing	15		
Marital Status			
Married	782 (90.8)		
Unmarried	79 (9.2)		
Missing	10		
Age of mother/guardian	861 (100)	29.04	7.484
Food Security Measures			
Household Production Diversity	862 (100)	2.10	1.551
Household Dietary Diversity	862 (100)	6.88	2.389
Maternal Dietary Diversity	842 (100)	5.14	2.398
Contextual Variables			
Ethnicity			
Southern Ghana ethnic origin	144 (16.5)		
Northern Ghana ethnic origin	706 (81.1)		
Others	21 (2.4)		
Religion			
Islam	387 (44.4)		
Christian	289 (33.2)		
Others	195 (22.4)		
Region			
Brong Ahafo	104 (11.9)		
Northern	572 (65.7)		
Upper East	120 (13.8)		
Upper West	75 (8.6)		
Place of residence			
Rural	725 (83.2)		
Urban	146 (16.8)		
Household size	871 (100)	7.20	3.873
Sex of Child			
Female	430 (49.4)		
Male	441 (50.6)		
Age of Child			
6 -11months	315 (36.2)		
12-17months	365 (41.9)		
18-23months	191 (21.9)		

4.2 Chi-Square Test of Independence between Complementary Feeding Indicators and Child Sex, Age, and Level of Household Food Security

4.2.1 Minimum Meal Frequency

Chi-Square test of independence indicated no significant association between MMF and child sex, MMF and child age, and MMF and level of household food security (Table 4.3).

Table 4.3 Results of Chi-square Test and Descriptive Statistics for Minimum Meal Frequency and categorical variables

Variables	Minimum Meal Frequency			
	No	Yes	X^2	df
Child sex				
Female	216(49.3%)	207(48.9%)	0.00[a]	1
Male	222(50.7%)	216(51.1%)		
Child Age				
6-11 months	164(37.4%)	151(35.7%)	0.51	2
12-17 months	177(40.4%)	181(42.8%)		
18-23 months	97(22.1%)	91(21.5%)		
Household hunger scale				
Food Secured Household	268(61.5%)	277(65.5%)	1.33[a]	1
Food non-secure Household	168(38.5%)	146(34.5%)		

Numbers in parentheses indicate column percentages. a=Yates' Correction of Continuity
*p < .05

4.2.2 Minimum Dietary Diversity

Chi-Square test of independence indicated no significant association between MDD and child sex. There was a significant association between MDD and child age, and MDD and level of household food security (table 4.4).

Table 4.4 Results of Chi-square Test and Descriptive Statistics for Minimum Dietary Diversity and categorical variables

Variables	Minimum Dietary Diversity			
	No	Yes	X^2	df
Child sex				
Female	285(47.3%)	145(54.1%)	3.21[a]	1
Male	318(52.7%)	123(45.9%)		
Child Age				
6-11 months	263(43.6%)	52(19.4%)	60.35*	2
12-17 months	242(40.1%)	123(45.9%)		
18-23 months	98(16.3%)	93(34.7%)		
Household hunger scale				
Food Secured Household	362(60.1%)	193(72.3%)	11.32[a]**	2
Food non-secure Household	240(39.9%)	74(27.7%)		

Numbers in parentheses indicate column percentages. a=Yates' Correction of Continuity
*p < .0001, **p<0.005

4.2.3 Minimum Acceptable Diet

Chi-Square test of independence indicated no significant association between MAD and child sex. There was a significant association between MAD and child age, and MAD and level of household food security (Table 4.5).

Table 4.5 Results of Chi-square Test and Descriptive Statistics for Minimum Acceptable diet and Categorical variables

Variables	Minimum Acceptable Diet			
	No	Yes	X^2	df
Child sex				
Female	348(47.9%)	82(56.6%)	3.25[a]	1
Male	378(52.1%)	63(43.4%)		
Child Age				
6-11 months	286(39.4%)	29(20.0%)	19.89*	2
12-17 months	287(39.5%)	78(53.8%)		
18-23 months	153(21.1%)	38(26.2%)		
Household hunger scale				
Food Secured Household	446(61.6%)	109(75.2%)	9.06**	2
Food non-secure Household	278(38.4%)	36(24.8%)		

Numbers in parentheses indicate column percentages. a=Yates' Correction of Continuity
*p < .0001, **p<0.005

4.3 Stratified Descriptive Analysis by Child Sex and Age

4.3.1 Descriptive statistics of outcome and main predictor variables for girls

In the subsample for girls, it is only within the age group of 18-23 months that majority of children have received MMF (52.5%) and MDD (54.4%) (Table 4.6). Although few girls have received MAD, yet the percentage of girls within the age group of 18-23 months (25.2%) was higher than the percentage of girls within 12-17 months (21.9%) and 6-11 months (11.4%). Majority of girls were found in food secured households among all the age groups (6-11 months, 65.1%; 12-17 months, 60.5%; 18-23 months, 70.9%). However, the percentage of girls in the oldest age group who were found in food secure households was greater compared to that of the rest of the age groups (Table 4.6).

4.3.2 Descriptive statistics of outcome and main predictor variables for boys

Majority of boys (52.4%) within 12-17 months have received MMF. Also, about 49% of boys within 6-11 months and approximately 44% of boys within 18-23 months have received MMF (Table 4.7). More boys within the older age group received MDD (6-11 months, 13.3%; 12-17 months, 34.2%; 18-23 months, 42%). Although the percentage of boys who have received MAD is low in all the three age groups, the percentage of boys within 12-17 months (20.9%) was greater compared to the other age groups (6-11 months, 7.2%; 18-23 months, 13.6%) (Table 4.7).

Majority of boys were found in food secured households among all the age groups (6-11 months, 60.8%; 12-17 months, 66.7%; 18-23 months, 60.2%). The percentage of boys within 12-17 months who were found in food secure households is greater than boys in the remaining age groups (Table 4.7).

[5]Table 4.6 Descriptive statistics for outcome variables and main predictor variables, girls. n=430

	6 to 11 months *n*=149	**12 to 17 months *n*=178**	**18 to 23 months *n*=103**
	n (%)	*n* (%)	*n* (%)
Dependent Variables			
Minimum Meal Frequency			
Yes	70 (47)	84 (51.4)	53 (52.5)
No	79 (53)	89 (48.6)	48 (47.5)
Missing		5	2
Minimum Dietary Diversity			
Yes	30 (20.1)	59 (33.1)	56 (54.4)
No	119 (79.9)	119 (66.9)	47 (45.6)
Missing			
Minimum Acceptable Diet			
Yes	17 (11.4)	39 (21.9)	26 (25.2)
No	132 (88.6)	139 (78.1)	77 (74.8)
Missing			
Main Predictor Variables			
Household Hunger Scale			
Little to no hunger (food secure)	97 (65.1)	107 (60.5)	73 (70.9)
Moderate to severe hunger (food non-secure)	52 (34.9)	70 (39.5)	30 (29.1)
Missing		1	

[5] Results are stratified by child sex and age in tables 4.6-4.18.

Table 4.7 Descriptive statistics for outcome variables and main predictor variables, boys. n=441

	6-11 months *n*=166	**12-17 months *n*=187**	**18-23 months *n*=88**
Dependent Variables			
	n (%)	*n* (%)	*n* (%)
Minimum Meal Frequency			
Yes	81 (48.8)	97 (52.4)	38 (43.7)
No	85 (51.2)	88 (47.6)	49 (56.3)
Missing		2	1
Minimum Dietary Diversity			
Yes	22 (13.3)	64 (34.2)	37 (42.0)
No	144 (86.7)	123 (65.8)	51 (58.0)
Missing			
Minimum Acceptable Diet			
Yes	12 (7.20)	39 (20.9)	12 (13.6)
No	154 (92.8)	148 (79.1)	76 (86.4)
Missing			
Main Predictor Variables			
Household Hunger Scale			
Little to no hunger (food secure)	101 (60.8)	124 (66.7)	53 (60.2)
Moderate to severe hunger (food non-secure)	65 (39.2)	62 (33.3)	35 (39.8)
Missing		1	

4.3.3 Descriptive statistics for contextual variables and resource variables, girls and boys

Table 4.8 and 4.9 present the descriptive results of contextual and resource characteristics of both girls and boys samples.

4.3.3.1 Maternal resource factors

Majority of the mothers in both samples were uneducated. Their low education level has been confirmed with the low level of English literacy within the samples. The mean age of the guardians is about 29 years with a standard deviation (SD) of about 8 years regardless of the child age stratification.

4.3.3.2 Food Security Resources

Among the three household food security measures in both girls' and boys' samples, household dietary diversity has about seven points as the highest mean score and an approximate SD of 3 points in both samples. The SD of both household production diversity and maternal dietary diversity are about halve of their mean scores irrespective of the child age stratification. This implies that few of the households have household food security measure scores concentrating around the mean scores.

4.3.3.3 Contextual factors

In both samples and in all the three age groups, majority of children were found in houses with northern Ghana ethnic origins. Although the main religion of most of the households is Islam, a good number of households are mainly Christians. Furthermore, majority of the children in both samples and in all the three age groups were in northern region. The region with few children in these samples is Upper West. Majority of the children were in rural areas at the time of data collection. Finally, the SD scores of the household size of both boys' and girls' samples are about halve the size of their mean scores; this means that few households have households size concentrating around seven members.

Table 4.8 Descriptive statistics for contextual variables and resource variables, girls

Maternal Resources	6 to 11 months *n* (%)	*M*	*SD*	12 to 17 months *n* (%)	*M*	*SD*	18 to 23 months *n* (%)	*M*	*SD*
Maternal/guardian Education Level									
Educated	10 (6.70)			8 (4.50)			10 (9.70)		
Uneducated	139 (93.30)			170 (95.50)			93 (90.30)		
Maternal/guardian English Literacy									
Literate	13 (9.00)			12 (6.90)			12 (11.90)		
Illiterate	132 (91.0)			162 (93.10)			89 (88.10)		
Missing	4			4			2		
Marital Status									
Married	132 (90.4)			158 (89.80)			92 (91.10)		
Unmarried	14 (9.60)			18 (10.20)			9 (8.90)		
Missing	3			2			2		
Age of mother/guardian	146 (100)	29.33	8.06	176 (100)	29.94	7.67	101 (100)	28.48	7.41
Food Security Measures									
Household Production Diversity	147 (100)	2.10	1.57	177 (100)	2.11	1.51	102 (100)	2.44	1.49
Maternal Dietary Diversity	143 (100)	3.85	1.52	172 (100)	3.71	1.46	99 (100)	3.99	1.39
Household Dietary Diversity	147 (100)	6.95	2.51	177 (100)	6.84	2.37	102 (100)	6.95	2.40
Contextual Variables									
Ethnicity									
Southern Ghana ethnic origin	20 (13.40)			38 (21.30)			16 (15.50)		
Northern Ghana ethnic origin	126 (84.60)			135 (75.80)			84 (81.60)		
Others	3 (2.00)			5 (2.80)			3 (2.90)		
Religion									
Islam	58 (38.90)			73 (41.00)			42 (40.80)		
Christian	48 (32.20)			62 (34.80)			42 (40.80)		
Others	43 (28.90)			43 (24.20)			19 (18.40)		
Region									
Brong Ahafo	15 (10.10)			18 (10.10)			14 (13.60)		
Northern	97 (65.10)			114 (64.00)			68 (66.00)		
Upper East	23 (15.40)			31 (17.40)			15 (14.60)		
Upper West	14 (9.40)			15 (8.40)			6 (5.80)		
Place of residence									
Rural	122 (81.90)			152 (85.40)			92 (89.30)		
Urban	27 (18.10)			26 (14.60)			11 (10.70)		
Household size	149 (100)	7.00	2.91	178 (100)	7.03	3.79	103 (100)	7.02	3.84

Table 4.9 Descriptive statistics for contextual variables and resource variables, boys

Maternal Resources	6 to 11 months *n* (%)	*M*	*SD*	12 to 17 months *n* (%)	*M*	*SD*	18 to 23 months *n* (%)	*M*	*SD*
Maternal/guardian Education Level									
Educated	14 (8.40)			15 (8.00)			9 (10.20)		
Uneducated	152 (91.60)			172 (92.00)			79 (89.80)		
Maternal/guardian English Literacy									
Literate	20 (12.20)			22 (12.00)			14 (15.90)		
Illiterate	144 (87.80)			162 (88.00)			74 (84.10)		
Missing	2			3					
Marital Status									
Married	149 (90.70)			169 (91.40)			82 (93.20)		
Unmarried	16 (9.30)			16 (8.60)			6 (6.80)		
Missing	1			2					
Age of mother/guardian	165 (100)	28.84	7.57	185 (100)	28.09	6.84	88 (100)	29.77	7.22
Food Security Measures									
Household Production Diversity	164 (100)	2.16	1.61	184 (100)	1.94	1.52	88 (100)	1.95	1.61
Maternal Dietary Diversity	162 (100)	3.71	1.52	178 (100)	3.72	1.54	88 (100)	3.90	1.29
Household Dietary Diversity	164 (100)	7.15	2.92	184 (100)	6.63	2.40	88 (100)	6.82	2.63
Contextual Variables									
Ethnicity									
Southern Ghana ethnic origin	28 (16.90)			25 (13.40)			17 (19.30)		
Northern Ghana ethnic origin	133 (80.10)			157 (84.00)			71 (80.70)		
Others	5 (3.00)			5 (2.70)					
Religion									
Islam	77 (46.40)			98 (52.40)			39 (44.30)		
Christian	57 (34.30)			47 (25.10)			33 (37.50)		
Others	32 (19.30)			42 (22.50)			16 (18.20)		
Region									
Brong Ahafo	28 (16.90)			13 (7.00)			16 (18.20)		
Northern	107 (64.50)			131 (70.10)			55 (62.50)		
Upper East	18 (10.70)			22 (11.80)			11 (12.50)		
Upper West	13 (7.80)			21 (11.20)			6 (6.80)		
Place of residence									
Rural	132 (79.50)			156 (83.40)			71 (80.70)		
Urban	34 (20.50)			31 (16.60)			17 (19.30)		
Household size	166 (100)	7.43	4.05	187 (100)	7.59	4.50	88 (100)	6.80	3.75

4.4 Stratified Bivariate Analysis by Child Sex and Age

4.4.0 Introduction

The bivariate analyses were done with the chi square test of independence and Spearman's rank-order correlation coefficient test.

4.4.1 Association between minimum meal frequency and household food security

A Chi-Square test of independence (with Yates Continuity Correction) indicated no significant association between MMF and household food security status irrespective of child age and sex stratification (Table 4.10).

Table 4.10 Association between minimum meal frequency and household food security, girls and boys

		6 to 11 months				12 to 17 months				18 to 23 months			
		No	Yes	χ^2	df	No	Yes	χ^2	df	No	Yes	χ^2	df
Girls													
	Household hunger scale												
	Little to no hunger	52	45			47	55			32	39		
		(65.8%)	(64.3%)			(53.4%)	(65.5%)			(66.7%)	(73.6%)		
				0.00	1			2.12	1			0.29	1
	Moderate to severe hunger	27	25			41	29			16	14		
		(34.2%)	(35.7%)			(46.6%)	(34.5%)			(33.3%)	(26.4%)		
Boys													
	Household hunger scale												
	Little to no hunger	50	51			56	66			31	21		
		(58.8%)	(63.0%)			(64.4%)	(68.0%)			(63.3%)	(55.3%)		
				0.15	1			0.14	1				
												0.29	1
	Moderate to severe hunger	35	30			31	31			18	17		
		(41.2%)	(37.0%)			(35.6%)	(32.0%)			(36.7%)	(44.7%)		

4.4.2 Association between minimum dietary diversity and household food security

A Chi-Square test of independence (with Yates Continuity Correction) indicated no significant association between MDD and household food security status irrespective of child age and sex stratification (Table 4.11).

Table 4.11 Association between minimum dietary diversity and household food security, girls and boys

		6 to 11 months				12 to 17 months				18 to 23 months			
		No	Yes	χ^2	df	No	Yes	χ^2	df	No	Yes	χ^2	df
Girls													
	Household hunger scale												
	Little to no hunger	73	24			68	39			31	42		
		(61.3%)	(80.0%)			(57.6%)	(66.1%)			(66.0%)	(75.0%)		
				2.90	1			0.85	1			0.62	1
	Moderate to severe hunger	46	6			50	20			16	14		
		(38.7%)	(20.0%)			(42.4%)	(33.9%)			(34.0%)	(25.0%)		
Boys													
	Household hunger scale												
	Little to no hunger	87	14			76	48			27	26		
		(60.4%)	(63.6%)			(61.8%)	(76.2%)			(52.9%)	(70.3%)		
				0.00	1			3.27	1			2.01	1
	Moderate to severe hunger	57	8			47	15			24	11		
		(39.6%)	(36.4%)			(38.2%)	(23.8%)			(47.1%)	(29.7%)		

4.4.3 Association between minimum acceptable diet and household food security

A Chi-Square test of independence (with Yates Continuity Correction) indicated no significant association between MAD and household food security status irrespective of child age and sex stratification (Table 4.12).

Table 4.12 Association between minimum acceptable diet and household food security, girls and boys

		6 to 11 months				12 to 17 months				18 to 23 months			
		No	Yes	χ^2	df	No	Yes	χ^2	df	No	Yes	χ^2	df
Girls													
	Household hunger scale												
	Little to no hunger	83	14			80	27			52	21		
		(62.9%)	(82.4%)			(58.0%)	(69.2%)			(67.5%)	(80.8%)		
				1.73	1			1.18	1			1.07	1
	Moderate to severe hunger	49	3			58	12			25	5		
		(37.1%)	(17.6%)			(42.0%)	(30.8%)			(32.5%)	(19.2%)		
Boys	Household hunger scale												
	Little to no hunger	94	7			93	31			44	9		
		(61.0%)	(58.3%)			(63.3%)	(79.5%)			(57.9%)	(75.0%)		
				0.00[a]	1			2.96	1			0.65[b]	1
	Moderate to severe hunger	60	5			54	8			32	2		
		(39.0%)	(41.7%)			(36.7%)	(20.5%)			(42.1%)	(25.0%)		

Note: a= one cell (25%) have expected count less than 5. The minimum expected count is 4.70
b= one cell (25%) have expected count less than 5. The minimum expected count is 4.77

4.4.4 Spearman's rank-order correlation between outcome variables and continues variables for girls 6-11 months

The relationship between MMF and maternal dietary diversity, household dietary diversity and household production diversity were investigated using Spearman's rank-order correlation for girls within the ages of 6-11 months. There was a very weak positive significant correlation between MMF and maternal dietary diversity, $\rho=0.17$, $n=143$, $p<0.05$. There was no significant correlation between MMF and household dietary diversity ($\rho=0.07$, $n=147$) and MMF and household production diversity ($\rho=0.05$, $n=147$).

The relationship between MDD and maternal dietary diversity, household dietary diversity and household production diversity were investigated using Spearman's rank-order correlation for girls within the ages of 6-11 months. There was a weak positive significant correlation between MDD and maternal dietary diversity ($\rho=0.31$, $n=143$, $p<0.01$) and MDD and household dietary diversity ($\rho=0.26$, $n=147$, $p<0.01$). However, there was no significant correlation between MDD and household production diversity ($\rho=0.02$, $n=147$).

The relationship between MAD and maternal dietary diversity, household dietary diversity and household production diversity were investigated using Spearman's rank-order correlation for girls within the ages of 6 through 11 months. There was a weak positive significant correlation between MAD diet and maternal dietary diversity ($\rho=0.24$, $n=143$, $p<0.01$) and a very weak positive significant correlation between MAD and household dietary diversity ($\rho=0.18$, $n=147$, $p<0.05$). However, there was no significant correlation between MAD and household production diversity ($\rho=-0.01$, $n=147$).

Table 4.13 Spearman's rank-order correlation between outcome variables and continues variables for girls ages 6 through 11 months

			1	2	3	4	5	6
1	Minimum Meal Frequency		-	0.10	0.38**	0.17*	0.07	0.05
		n		149	149	143	147	147
2	Minimum Dietary Diversity			-	0.72**	0.31**	0.26**	0.02
		n			149	143	147	147
3	Minimum Acceptable Diet				-	0.24**	0.18*	-0.01
		n				143	147	147
4	Maternal Dietary Diversity					-	0.49**	0.28**
		n					141	141
5	Household dietary diversity						-	0.43**
		n						147
6	Household Production Diversity Score (8 food groups)							-
		n						

**Correlation is significant at the 0.01 level (2-tailed)

*Correlation is significant at the 0.05 level (2-tailed)

4.4.5 Spearman's rank-order correlation between outcome variables and continues variables for boys 6-11 months

The relationship between MMF and maternal dietary diversity, household dietary diversity and household production diversity were investigated using Spearman's rank-order correlation for boys within the ages of 6-11 months. There was no significant correlation between MMF and maternal dietary diversity (ρ=0.05, n=162), MMF and household dietary diversity (ρ=0.01, n=164), and MMF and household production diversity (ρ=0.07, n=162).

The relationship between MDD and maternal dietary diversity, household dietary diversity and household production diversity were investigated using Spearman's rank-order correlation for boys within the ages of 6-11 months. There was a very weak positive significant correlation between MDD and maternal dietary diversity (ρ=0.18, n=164, p<0.05). But there was no significant correlation between MDD and maternal dietary diversity (ρ=0.13, n=162), and MDD and household production diversity (ρ=0.06, n=162).

The relationship between MAD and maternal dietary diversity, household dietary diversity and household production diversity were investigated using Spearman's rank-order correlation coefficient for boys within the ages of 6-11 months. There was no significant correlation between MAD and maternal dietary diversity (ρ=0.02, n=162), MAD and household dietary diversity (ρ=0.10, n=164), and MAD and household production diversity (ρ=0.14, n=162).

Table 4.14 Spearman's rank-order correlation between outcome variables and continues variables for boys ages 6 through 11 months

			1	2	3	4	5	6
1	Minimum Meal Frequency		-	0.05	0.29**	0.05	0.01	0.07
		n		166	166	162	164	164
2	Minimum Dietary Diversity			-	0.71**	0.13	0.18*	0.06
		n			166	162	164	164
3	Minimum Acceptable Diet				-	0.02	0.10	0.14
		n				162	164	164
4	Maternal Dietary Diversity					-	0.42**	0.17*
		n					160	160
5	Household dietary diversity						-	0.26**
		n						164
6	Household Production Diversity Score (8 food groups)							-

**Correlation is significant at the 0.01 level (2-tailed)

*Correlation is significant at the 0.05 level (2-tailed)

4.4.6 Spearman's rank-order correlation between outcome variables and continues variables for girls 12-17 months

The relationship between MMF and maternal dietary diversity, household dietary diversity and household production diversity was investigated using Spearman's rank-order correlation for girls within the ages of 12-17 months. There was no significant correlation between MMF and maternal dietary diversity (ρ=0.05, n=168), MMF and household dietary diversity (ρ=-0.01, n=172) and MMF and household production diversity (ρ=-0.01, n=172).

The relationship between MDD and maternal dietary diversity, household dietary diversity and household production diversity were investigated using Spearman's rank-order correlation for girls within the ages of 12-17 months. There was a moderate positive significant correlation between MDD and maternal dietary diversity (ρ=0.43, n=172, p<0.01) and a very weak positive significant correlation between MDD and household production diversity (ρ=0.18, n=177, p<0.01). However, there was no significant correlation between MDD and household dietary diversity (ρ=0.12, n=177).

The relationship between MAD and maternal dietary diversity, household dietary diversity and household production diversity were investigated using Spearman's rank-order correlation for girls within the ages of 12-17 months. There was a weak positive significant correlation between MAD and maternal dietary diversity (ρ=0.30, n=172, p<0.01). However, there were no significant correlation between MAD and household dietary diversity (ρ=0.09, n=177) and MAD and household production diversity (ρ=0.09, n=177).

Table 4.15 Spearman's rank-order correlation between outcome variables and continues variables for girls ages 12 through 17 months

			1	2	3	4	5	6
1	Minimum Meal Frequency		-	0.25**	0.56**	0.05	-0.01	-0.01
		n		173	173	168	172	172
2	Minimum Dietary Diversity			-	0.75**	0.43**	0.12	0.18*
		n			178	172	177	177
3	Minimum Acceptable Diet				-	0.30**	0.09	0.09
		n				172	177	177
4	Maternal Dietary Diversity					-	0.28**	0.23**
		n					171	171
5	Household dietary diversity						-	0.40**
		n						177
6	Household Production Diversity Score (8 food groups)							-

**Correlation is significant at the 0.01 level (2-tailed)

*Correlation is significant at the 0.05 level (2-tailed)

4.4.7 Spearman's rank-order correlation between outcome variables and continues variables for boys 12-17 months

The relationship between MMF and maternal dietary diversity, household dietary diversity and household production diversity were investigated using Spearman's rank-order correlation for boys within the ages of 12-17 months. There was no significant correlation between MMF and maternal dietary diversity (ρ=0.01, n=177), MMF and household dietary diversity (ρ=0.11, n=182), and MMF and household production diversity (ρ=0.07, n=182).

The relationship between MDD and maternal dietary diversity, household dietary diversity and household production diversity was investigated using Spearman's rank-order correlation for boys within the ages of 12-17 months. There was a moderate positive significant correlation between MDD and maternal dietary diversity (ρ=0.40, n=178, p<0.01) and a weak positive significant correlation between MDD and maternal dietary diversity (ρ=0.22, n=184, p<0.01). But there was no significant correlation between MDD and household production diversity (ρ=0.01, n=184).

The relationship between MAD and maternal dietary diversity, household dietary diversity and household production diversity were investigated using Spearman's rank-order correlation coefficient for boys within the ages of 12-17 months. There was a weak positive significant correlation between MAD and maternal dietary diversity (ρ=0.28, n=178, p<0.01) and a very weak positive significant correlation MAD and household dietary diversity (ρ=0.19, n=184, p<0.05). But there was no significant correlation between MAD and household production diversity (ρ=0.04, n=184).

Table 4.16 Spearman's rank-order correlation between outcome variables and continues variables for boys ages 12 through 17 months

			1	2	3	4	5	6
1	Minimum Meal Frequency		-	0.16*	0.49**	0.01	0.11	0.07
		n		185	185	177	182	182
2	Minimum Dietary Diversity			-	0.71**	0.40**	0.22**	0.01
		n			187	178	184	184
3	Minimum Acceptable Diet				-	0.28**	0.19*	0.04
		n				178	184	184
4	Maternal Dietary Diversity					-	0.47**	0.10
		n					175	175
5	Household dietary diversity						-	0.23**
		n						184
6	Household Production Diversity Score (8 food groups)							-

*Correlation is significant at the 0.05 level (2-tailed)

**Correlation is significant at the 0.01 level (2-tailed)

4.4.8 Spearman's rank-order correlation between outcome variables and continues variables for girls 18-23 months

The relationship between MMF and maternal dietary diversity, household dietary diversity and household production diversity were investigated using Spearman's rank-order correlation for girls within the ages of 18-23 months. There was no significant correlation between MMF and maternal dietary diversity (ρ=0.05, n=97), MMF and household dietary diversity (ρ=0.13, n=100) and MMF and household production diversity (ρ=0.05, n=100).

The relationship between MDD and maternal dietary diversity, household dietary diversity and household production diversity were investigated using Spearman's rank-order correlation for girls within the ages of 18-23 months. There was a moderate positive significant correlation between MDD and maternal dietary diversity (ρ=0.48, n=99, p<0.01). However, there was no significant correlation between MDD and household production diversity (ρ=0.16, n=102) MDD and household dietary diversity (ρ=-0.00, n=102).

The relationship between MAD and maternal dietary diversity, household dietary diversity and household production diversity were investigated using Spearman's rank-order correlation for girls within the ages of 18-23 months. There was a weak positive significant correlation between MAD and maternal dietary diversity (ρ=0.21, n=99, p<0.05) and between MAD and household dietary diversity (ρ=0.27, n=102, p<0.01). But there was no significant correlation between MAD and household production diversity (ρ=0.08, n=102).

Table 4.17 Spearman's rank-order correlation between outcome variables and continues variables for girls ages 18 through 23 months

			1	2	3	4	5	5
1	Minimum Meal Frequency		-	0.05	0.56**	0.05	0.13	0.05
		n		101	101	97	100	100
2	Minimum Dietary Diversity			-	0.53**	0.48**	0.16	-0.00
		n			103	99	102	102
3	Minimum Acceptable Diet				-	0.21*	0.27**	0.08
		n				99	102	102
4	Maternal Dietary Diversity					-	0.29**	0.09
		n					98	98
5	Household dietary diversity						-	0.47**
		n						102
6	Household Production Diversity Score (8 food groups)							-

**Correlation is significant at the 0.01 level (2-tailed)

*Correlation is significant at the 0.05 level (2-tailed)

4.4.9 Spearman's rank-order correlation between outcome variables and continues variables for boys 18-23 months

The relationship between MMF and maternal dietary diversity, household dietary diversity and household production diversity was investigated using Spearman's rank-order correlation for boys within the ages of 18-23 months. There was no significant correlation between MMF and maternal dietary diversity (ρ=-0.11, n=87), MMF and household dietary diversity (ρ=-0.04, n=87), and MMF and household production diversity (ρ=0.07, n=87).

The relationship between MDD and maternal dietary diversity, household dietary diversity and household production diversity were investigated using Spearman's rank-order correlation for boys within the ages of 18-23 months. There was a moderate positive significant correlation between MDD and maternal dietary diversity (ρ=0.41, n=88, p<0.01). However, there were no significant correlation between MDD and household production diversity (ρ=0.15, n=88) MDD and household dietary diversity (ρ=-0.00, n=88).

The relationship between MAD and maternal dietary diversity, household dietary diversity and household production diversity were investigated using Spearman's rank-order correlation coefficient for boys within the ages of 18-23 months. There was no significant correlation between MAD and maternal dietary diversity (ρ=0.20, n=88), MAD and household dietary diversity (ρ=0.08, n=88), and MAD and household production diversity (ρ=0.10, n=88).

Table 4.18 Spearman's rank-order correlation between outcome variables and continues variables for boys ages 18 through 23 months

			1	2	3	4	5	6
1	Minimum Meal Frequency		-	-0.15	0.45**	-0.11	-0.04	0.07
		n		87	87	87	87	87
2	Minimum Dietary Diversity			-	0.47**	0.41**	0.15	0.01
		n			88	88	88	88
3	Minimum Acceptable Diet				-	0.20	0.08	0.10
		n				88	88	88
4	Maternal Dietary Diversity					-	0.29**	0.13
		n					88	88
5	Household dietary diversity						-	0.37**
		n						88
6	Household Production Diversity Score (8 food groups)							-

**Correlation is significant at the 0.01 level (2-tailed)

4.5 Logistic Regression Models of the Outcome Variables and Predictor Variables with the Full Sample

4.5.1 Minimum Meal Frequency

Direct logistic regression was performed to assess the impact of household food security factors, maternal characteristics and contextual factors on the likelihood of children receiving MMF in northern Ghana. The model contained four household food security indicators (household food security, household dietary diversity, household production diversity and maternal dietary diversity), three maternal characteristics (maternal education, maternal English literacy status and maternal age) and five contextual factors (child sex, child age, place of residence, region and household size). The full model containing all the predictors was not statistically significant, χ^2 (15, n= 820) = 16.73, indicating that the model was not able to distinguish between children who received MMF and those who did not received MMF as reported by their guardians. The model as a whole poorly explained between 2% (Cox and Snell R square) and 3% (Nagelkerke R squared) of the variance in a child's receiving of MMF, and correctly classified 56.3% of the cases. As shown in table 4.19, none of the household food security indicators and maternal characteristics made any unique statistically significant contribution to the model. However, among the contextual variables, region made a statistically significant contribution to the model.

Compared to Brong Ahafo, being in Upper west as a child was a significant predictor of receiving MMF. That is, there was a 44% decrease in odds of receiving inadequate MMF among children living in Upper West [O.R=0.46; 95% CI: 0.24, 0.89].

Table 4.19 Minimum meal frequency received by children regressed on household food security variables, maternal resources and contextual variables

	β	S.E.	Wald	df	p<	O.R.	95% C.I. for O.R	
							Lower	Upper
Household Food Security (Food secure is reference)	-0.10	0.16	0.43	1	0.52	0.90	0.66	1.23
Household dietary Diversity (continuous variable)	-0.02	0.04	0.45	1	0.50	0.98	0.91	1.05
Household Production Diversity (continuous variable)	0.01	0.05	0.03	1	0.87	1.01	0.91	1.12
Maternal Dietary Diversity (continuous variable)	-0.04	0.05	0.55	1	0.46	0.96	0.87	1.07
Child Sex (Girls as reference)	-0.01	0.14	0.00	1	0.97	1.00	0.75	1.32
Child Age (6 to 11 months is reference)			0.57	2	0.75			
12 to 17 months	-0.12	0.16	0.51	1	0.48	0.89	0.65	1.22
18 to 23 months	-0.02	0.19	0.01	1	0.92	0.98	0.68	1.43
Maternal Education (Educated is reference)	0.36	0.37	0.92	1	0.34	1.43	0.69	2.97
Maternal English Literacy (Literate is reference)	-0.18	0.32	0.33	1	0.56	0.83	0.45	1.55
Maternal/Guardian Age (continuous variable)	-0.00	0.01	0.08	1	0.78	1.00	0.98	1.02
Urban/Rural (Urban is Reference)	-0.05	0.21	0.06	1	0.80	0.95	0.63	1.49
Region (Brong Ahafo is Reference)			11.93	3	0.01			
Northern Region	-0.44	0.23	3.47	1	0.06	0.65	0.41	1.02
Upper East	0.14	0.29	0.21	1	0.64	1.15	0.64	2.04
Upper West	-0.77	0.34	5.26	1	0.02	0.46	0.24	0.89
Household Size (continuous variable)	0.01	0.02	0.34	1	0.56	1.01	0.97	1.05
Constant	0.77	0.47	2.68	1	0.10	2.15		

Overall model fit estimates: R square range: 0.02 – 0.03.
χ^2=16.73, degree of freedom=15.
O.R. indicates odds ratio.
C.I. indicates confidence intervals

4.5.2 Minimum dietary Diversity

Direct logistic regression was performed to assess the impact of household food security factors, maternal characteristics and contextual factors on the likelihood of children receiving MDD in northern Ghana. The model contained four household food security indicators (household food security, household dietary diversity, household production diversity and maternal dietary diversity), three maternal characteristics (maternal education, maternal English literacy status and maternal age) and five contextual factors (child sex, child age, place of residence, region and household size). The full model containing all the predictors was statistically significant, χ^2 (15, n= 828) = 199.06, indicating that the model was able to distinguish between children who received MDD and those who did not received MDD as reported by their guardians. The model as a whole explained between 21% (Cox and Snell R square) and 30% (Nagelkerke R squared) of the variance in a child's receiving of MDD, and correctly classified 76.2% of the cases. As shown in table 4.20, two of the household food security indicators (household hunger status and maternal dietary diversity) and three contextual factors (child age, region and household size) made unique statistically significant contributions to the model. However, none of the maternal characteristics made a statistically significant contribution to the model.

Household food security, maternal dietary diversity, child age, region and household size were significant predictors of MDD in northern regions of Ghana. Food secured households [O.R= 0.62; 95% CI: 0.43, 0.91], more diverse maternal diet [O.R=0.58 95% CI: 0.50, 0.66], being in the age group of 18-23 months [O.R= 0.18; 95% CI: 0.12, 0.29] and 12-17 months [O.R=0.32; 95% CI: 0.21, 0.48], and living in Upper West [O.R=0.45; 95% CI: 0.21, 0.99] decrease the odds in receiving inadequate MDD among children in northern regions of Ghana. Children in small households were at better odds of receiving the recommended MDD [O.R=1.06 95% CI: 1.01, 1.12].

Table 4.20 Minimum dietary diversity received by children regressed on household food security variables, maternal resources and contextual variables

	B	S.E.	Wald	df	p<	O.R.	95% C.I. for O.R.	
							Lower	Upper
Household Food Security (Food secure is reference)	-0.47	0.19	5.97	1	0.02	0.62	0.43	0.91
Household dietary Diversity (continuous variable)	-0.06	0.04	1.89	1	0.17	0.94	0.86	1.03
Household Production Diversity (continuous variable)	-0.03	0.07	0.14	1	0.71	0.98	0.86	1.11
Maternal Dietary Diversity (continuous variable)	-0.55	0.07	64.17	1	0.00	0.58	0.50	0.66
Child Sex (Girls as reference)	-0.25	0.17	2.09	1	0.15	0.78	0.56	1.09
Child Age (6 to 11 months is reference)			53.37	2	0.00			
12 to 17 months	-1.15	0.21	28.65	1	0.00	0.32	0.21	0.48
18 to 23 months	-1.70	0.24	51.39	1	0.00	0.18	0.12	0.29
Maternal Education (Educated is reference)	-0.74	0.44	2.79	1	0.10	0.48	0.20	1.14
Maternal English Literacy (Literate is reference)	-0.14	0.38	0.13	1	0.72	0.87	0.41	1.85
Maternal/Guardian Age (continuous variable)	-0.01	0.01	1.13	1	0.29	0.99	0.96	1.01
Urban/Rural (Urban is Reference)	0.13	0.25	0.27	1	0.61	1.14	0.70	1.86
Region (Brong Ahafo is Reference)			9.93	3	0.02			
Northern Region	0.21	0.28	0.59	1	0.44	1.24	0.72	2.12
Upper East	-0.13	0.34	0.14	1	0.71	0.88	0.45	1.73
Upper West	-0.79	0.40	3.96	1	0.05	0.45	0.21	0.99
Household Size (continuous variable)	0.06	0.03	5.89	1	0.02	1.06	1.01	1.12
Constant	4.81	0.61	61.92	1	0.00	122.69		

Overall model fit estimates: R square range: 0.21 – 0.30.
χ^2=199.06, degree of freedom=15.
O.R. indicates odds ratio.
C.I. indicates confidence intervals

4.5.3 Minimum Acceptable Diet

Direct logistic regression was performed to assess the impact of household food security factors, maternal characteristics and contextual factors on the likelihood of children receiving MAD in northern Ghana. The model contained four household food security indicators (household food security, household dietary diversity, household production diversity and maternal dietary diversity), three maternal characteristics (maternal education, maternal English literacy status and maternal age) and five contextual factors (child sex, child age, place of residence, region and household size). The full model containing all the predictors was statistically significant, χ^2 (15, n= 828) = 78.68, indicating that the model was able to distinguish between children who received MAD and those who did not received MAD as reported by their guardians. The model as a whole explained between 9% (Cox and Snell R square) and 15% (Nagelkerke R squared) of the variance in a child's receiving of MAD, and correctly classified 82.6% of the cases. As shown in table 4.21, two of the household food security indicators (household hunger status and maternal dietary diversity) and only one of the contextual factors (child age) made unique statistically significant contributions to the model. However, none of the maternal characteristics made a statistically significant contribution to the model.

Food secure household, maternal dietary diversity, and child age were significant predictors of MAD in northern regions of Ghana. Food secured households [O.R= 0.62; 95% CI: 0.40, 0.97], more diverse maternal diet [O.R=0.72 95% CI: 0.62, 0.83], and being in the age group of 18-23 months [O.R= 0.42; 95% CI: 0.24, 0.71] and 12 to 17 months [O.R=0.34; 95% CI: 0.21, 0.55] decrease the odds in receiving inadequate MAD among children in northern regions of Ghana.

Table 4.21 Minimum acceptable diet received by children regressed on household food security variables, maternal resources and contextual variables

	B	S.E.	Wald	Df	p<	O.R.	95% C.I. for O.R.	
							Lower	Upper
Household Food Security (Food secure is reference)	-0.47	0.23	4.35	1	0.04	0.62	0.40	0.97
Household dietary Diversity (continuous variable)	-0.08	0.05	2.22	1	0.14	0.93	0.84	1.02
Household Production Diversity (continuous variable)	-0.04	0.07	0.24	1	0.62	0.96	0.83	1.12
Maternal Dietary Diversity (continuous variable)	-0.33	0.07	21.26	1	0.00	0.72	0.62	0.83
Child Sex (Girl is reference)	-0.37	0.20	3.48	1	0.06	0.69	0.47	1.02
Child Age (6 to 11 months is reference)			19.82	2	0.00			
12 to 17 months	-1.08	0.25	19.39	1	0.00	0.34	0.21	0.55
18 to 23 months	-0.88	0.28	10.08	1	0.00	0.42	0.24	0.71
Maternal Education (Educated is reference)	-0.10	0.49	0.04	1	0.84	0.91	0.35	2.36
Maternal English Literacy (Literate is reference)	-0.21	0.44	0.24	1	0.63	0.81	0.34	1.90
Maternal/Guardian Age (continuous variable)	-0.02	0.01	1.54	1	0.21	0.98	0.95	1.01
Urban/Rural (Urban is Reference)	0.09	0.28	0.09	1	0.77	1.09	0.62	1.90
Region (Brong Ahafo is Reference)			6.85	3	0.08			
Northern Region	0.11	0.32	0.13	1	0.72	1.12	0.60	2.08
Upper East	0.40	0.42	0.92	1	0.34	1.50	0.66	3.42
Upper West	-0.65	0.43	2.29	1	0.13	0.52	0.22	1.21
Household Size	0.03	0.03	0.92	1	0.34	1.03	0.97	1.08
Constant	5.07	0.70	51.89	1	0.00	158.50		

Overall model fit estimates: R square range: 0.09 – 0.15.
χ^2=78.68, degree of freedom=15.
O.R. indicates odds ratio.
C.I. indicates confidence interval

CHAPTER FIVE
DISCUSSION

5.0 Summary of Results

The study investigated the relationship between level of household food security and complementary feeding practices—MMF, MDD, and MAD—in northern regions of Ghana. The study addressed three research questions. The questions and their corresponding answers are as follows:

1. What is the relationship between the level of household food security and infant and young child complementary feeding practices—MMF, MDD, MAD—in the northern regions of Ghana?

The results indicate that there was a decent amount of variance accounted for in the analysis of MDD (.20-.30), modest for MAD (.09-.15) and almost nothing for MMF (.02-03). For MDD and MAD, the models are about the same, and household food security status has importance even accounting for every predictor variable in the models. Certain aspects of child complementary feeding are significantly related to household food security status (MDD and MAD) and others are not (MMF). While household food security was related to two measures of child complementary feeding adequacy (MDD and MAD), there were instances of underfed children in food secure households and of well-fed children in food insecure households in northern Ghana.

In the logistic regression models, maternal dietary diversity, a proxy for household food security, was related with two measures of child complementary feeding adequacy (MDD and MAD) but not with MMF. Household production diversity and household dietary diversity were not related with any of the measures of child complementary feeding adequacy in the logistic regression models.

2. What is the relationship between child sex and age and complementary feeding practices in the northern regions of Ghana?

Accounting for every predictor variable in the logistic regression models, the results indicated that there was a powerful effect of child age in relation to two measures of child complementary feeding adequacy (MDD and MAD). Although children within the youngest age group (6-11 months) were at risk of being underfed, there were instances of inadequate and adequate recommended feeding of children across the three age groups (6-11 months, 12-17 months, and 18-23 months).

No association was observed between child sex and complementary feeding.

3. What is the relationship between socio-demographic characteristics and infant and young child feeding practices in the northern regions of Ghana?

Accounting for every predictor variable in the logistic regression models, the results indicated that region of residence was related with two measures of child complementary feeding adequacy (MMF and MDD) but not with MAD; compared to Brong Ahafo, children in Upper West were significantly more likely to receive adequate complementary feeding. Also, household size was related with only one of the measures of child feeding adequacy (MDD) after accounting for every predictor variable in the models; children living in small households were more likely to receive adequate complementary feeding.

Maternal age, maternal literacy, maternal education, and locality of residence were not significantly related with any measure of child complementary feeding adequacy.

5.1 Discussion of Results

5.1.1 Food Security Measures and Measures of Child Complementary Feeding

5.1.1.1 Household Food Security and Child Complementary Feeding

The analyses in this thesis show that household food security is a significant predictor of child complementary feeding, a strong support for the postulation in the Model of Childcare. The result indicated that children in food secured households were more likely to achieve MDD and MAD compared to food insecure households. In the Model of Childcare, food security resources include area food availability, household food availability, household feeding priorities, and food aid (Amugsi, 2015; Matanda, 2015). The household food security measure in this thesis assessed the accessibility to and availability of household food security resources. The results from this study suggest that food secure households may have access to resources that enabled them to overcome frequent food insecure situations that are prevalent in the northern regions of Ghana. Empirical studies from Ghana and Ethiopia postulate that food secure households might have access to large farmlands and engage in large scale agricultural productions, from which they have enough foodstuffs stored for household consumption (Aidoo, Mensah, & Tuffour, 2013; Tefera & Tefera, 2014). Income from some of the land produce of food secure households could serve as a protective factor against food insecurity situations (Abafita & Kim, 2013; Tefera & Tefera, 2014). Another explanation for the results might be that mothers in food secure households have more time with their

children, which might have resulted in the achievement of recommended child complementary feeding.

The analyses also show that there were instances of child complementary feeding adequacy in food insecure households. Household feeding priorities was cited in the Model of Childcare as an indicator of food security resources (Amugsi, 2015; Matanda, 2015). Therefore, household feeding priorities in food insecure households might be the explanation for child complementary feeding adequacy in northern regions of Ghana; priority might be given to children in food insecure households when it comes to feeding.

5.1.1.2 Maternal Dietary Diversity and Child Complementary Feeding

The analyses in this thesis demonstrate that maternal dietary diversity is a predictor of MDD and MAD, but not of MMF. The result indicated that mothers whose diets are diverse are more likely to give their children adequate complementary feeding. The protective effect of maternal dietary diversity against inadequate MDD and MAD in northern Ghana is consistent with findings of studies in sub Saharan Africa and South and East Asia and Latin America (Amugsi et al., 2015; Nguyen et al., 2013; USAID, 2012). In the Ghana study by Amugsi et al. (2015), however, the child dietary diversity score was created by summing the scores on 15 food items that the children were fed with. The maternal dietary diversity scores were equally created by summing 15 food items that the mothers consumed 24-hours prior to the data collection, parallel to the 15 food items that were used to create child dietary diversity score. The consistency of the results of the present study with other studies may be questionable because of the differences in the operationalization of maternal and child dietary diversity. That notwithstanding, it is clear that maternal dietary diversity is a significant pathway to achieving recommendation for MDD and MAD among children in northern regions of Ghana.

5.1.1.2 Household Dietary Diversity and Child Complementary Feeding

The researcher expected household dietary diversity to be positively associated with child complementary feeding in the northern regions of Ghana. However, the analyses of this thesis show that household dietary diversity did not significantly relate with any of the measures of child complementary feeding adequacy. No study, to the best of the researcher's knowledge, has investigated the relationship between household dietary diversity and the achievement of child complementary feeding adequacy. Therefore, this result could not be discussed in relation with other studies.

5.1.1.3 Household Production Diversity and Child Complementary Feeding

The researcher expected household production diversity to be positively associated with child complementary feeding in the northern regions of Ghana. However, the analyses of this thesis show that household production diversity did not significantly relate with any of the measures of child complementary feeding adequacy. Household production diversity was absent in many of the studies reviewed. Majority of the studies reviewed used DHS data. The DHS did not provide data on household production diversity, which made it impossible for studies to investigate the link between production diversity and complementary feeding practices. However, in one study in Nepal, household production diversity was found to be a significant predictor of child dietary diversity but with an implication that "production diversity must increase by four food groups to increase dietary diversity by one food group among children" (Malapit et al., 2015, p. 1121).

5.1.2 Child Age, Child Sex, and Child Complementary Feeding

5.1.2.1 Child Age and Child Complementary Feeding

The results from this study indicated that complementary feeding improved with age, with older children being more likely to achieve MDD and MAD. One possible explanation why infants (6-11 months) may be at risk of receiving complementary feeding in the northern regions of Ghana is that they (children 6-11 months) may be considered too young for solid foods. This result confirms findings from similar studies in sub Saharan and South and East Asian countries that observed that children between 12-23 months were more likely to achieve MDD (Beyene et al., 2015; Issaka et al., 2015a, 2015b; Kabir et al., 2012; Ng et al., 2012; Nguyen et al., 2013; Wang et al., 2011; Victor et al., 2014) and MAD (Issaka et al., 2015b; Joshi et al., 2012; Ng et al., 2012; Victor et al., 2014).

The result of this study also contradicts findings of studies from Nigeria and Ghana (Issaka et al., 2015a). In the Ghana study by Issaka et al. (2015a), the 2008 DHS data was used with national representative sample, whereas in the present study the study sample focused on regions in the northern part of Ghana. This difference in representativeness may be the reason for the contradiction in the results of this study and that of Issaka et al. (2015a). Findings by Amugsi et al. (2013) on the regional differentials of child malnutrition may offer an insight into the contradictions between the results of this study and that of Issaka et al. (2015a). In connection with regional disparities, Amugsi et al. (2013) observed highest levels of child malnutrition in the northern regions compared to decreasing national child malnutrition trend.

These variations could be investigated through a trend analysis of DHS data by dividing the regions in Ghana into three different regional belts—southern, central, and northern belt—and compare how children within these belts achieve recommendations of complementary feeding over time stratified by child age.

Although there is a compelling evidence in the literature that children within the 12-23 months age bracket were more likely to receive MMF compared to infants 6-11 months (Beyene et al., 2015; Issaka et al., 2015b; Joshi et al., 2012; Ng et al., 2012; Victor et al., 2014), child age in this study was not a statistical significant predictor of MMF. Nevertheless, the positive odds demonstrated by children within the oldest age bracket (12-23 months) suggest that older children were more likely to achieve MMF than 6-11 month old children.

5.1.2.2 Child Sex and Child Complementary Feeding

Compared to girl children, boy children were more likely to receive MDD and MAD. Although the odds ratios for sex was not statistically significant, the differences in odds between girls and boys were relatively wide. This variation could happen by mere chance because sex was not a statistical significant predictor. Also, there were more boys than girls in the study sample. The results in this study, however, are consistent with results of a study on Nigerian children (Issaka et al., 2015a). Close to the complementary feeding indicators used in this study is the timely initiation of complementary feeding, which may offer an insight into the sex differentials in adequate complementary feeding. Girl children in Senegal were more likely to achieve the timely introduction of complementary feeding than boys (Issaka et al., 2015b). Contrary to findings from this study, boy children were at better odds of achieving timely complementary feeding in Ethiopia and Kenya (Kimani-Murage et al., 2011; Semahegn et al., 2014).

5.1.3 Socio-demographic Characteristics and Measures of Child Complementary Feeding

5.1.3.1 Region of Residence and Child Complementary Feeding

The study confirmed the existence of regional differentials in achieving recommendation of MMF, as established by studies in both sub Saharan Africa and South and East Asian countries (Beyene et al., 2015; Issaka et al., 2015a, 2015b; Kabir et al., 2012; Ng et al., 2012; Patel et al., 2012; Senarath et al., 2012). The result that children in Upper West were more likely to achieve MMF, MDD, and MAD should be taken with a caution, for Upper West had

the lowest number of children in the study sample. That notwithstanding, Upper West is the poorest region among the regions in northern Ghana (Amanor-Boadu et al., 2013). The Key underlying factor of inappropriate childcare practice is poverty (Frankenberger, 1996 cited in Smith & Haddad, 2000b, p. 4). The fact that Upper West is the poorest region but with increased odds in achieving recommended complementary feeding among children suggest that mothers or primary caregivers may be benefiting from childcare programs. Generally, the northern regions of Ghana benefit from childcare intervention programs compared to other parts of the country. For example, the 2012 FTF-PBS was a baseline survey to measure the impact of several maternal and child nutrition interventions five years after the survey (Zereyesus et al., 2014).

5.1.3.2 Household Size and Child Complementary Feeding

Children in households with more members were less likely to achieve the recommended dietary diversity. One possible explanation could be that competition for available resources among household members may decrease the odds in achieving the recommendation of MDD among children in the northern regions of Ghana.

5.1.3.3 Maternal Education, Maternal Literacy, and Child complementary Feeding

The absence of statistical significant impact of maternal education and maternal literacy on the achievement of MMF, MDD, and MAD in the northern regions of Ghana may be attributed to the high illiteracy and low level of education of mothers in the sample. However, the protective effects demonstrated by maternal education and literacy against inadequate dietary diversity and acceptable diet proved that maternal education and literacy are important determinants of complementary feeding practices. In many sub Saharan African countries (Beyene et al., 2015; Issaka et al., 2015a, 2015b; Ogbo et al., 2015; Victor et al., 2014) and south and East Asian countries (Joshi et al., 2012; Kabir et al., 2012; Malhotra, 2013; Ng et al., 2012; Patel et al., 2012; Senarath et al., 2012), maternal literacy and education increases the odds in achieving complementary feeding among children.

5.1.3.4 Maternal Age and Child Complementary Feeding

Maternal age was not a predictor of any measure of child complementary feeding adequacy in the analyses. The researcher expected child complementary feeding adequacy will improve based on the age of the mother.

5.1.3.5 Locality of Residence (Rural/Urban) and Child Complementary Feeding

The analyses in this study show that locality of residence is not an important predictor of achievement of recommended child complementary feeding. A possible explanation is that the study population was mainly rural; that is, there is little variability in the variable for locality of residence. This result is inconsistent with multiple studies that established locality of residence as a predictor of achievement of child complementary feeding (Beyene et al., 2015; Issaka et al., 2015a, 2015b; Kabir et al., 2012; Ng et al., 2012; Patel et al., 2012; Senarath et al., 2012).

5.4 Strengths and Limitations of the Study

5.4.1 Study Strengths

This study has strengths that deserve to be mentioned. To the best of the researcher's knowledge, this is one of the first empirical studies that investigated the relationship between food security and child complementary feeding; therefore, this study fills an important gap in the literature.

Another strength worth mentioning is the disaggregation involved in the study. The child age and sex stratification in the analysis assisted in a better understanding of the child age differentials in complementary feeding practices.

Last but not least is the use of a high quality regionally representative data to investigate the relationship between household food security and achievement of child complementary feeding in northern regions of Ghana.

5.4.2 Study Limitation

The 24-hour recall on the food group given by guardians/mothers to children is the first limitation. This type of recall only makes estimates about what the child was given 24 hours prior to the day of the interview; conclusions about how children are well-fed or underfed are limited. The results of this study might not be representative of the diet the child receives during a week or a month. However, this way of assessing child diet has been shown to have the potential to predict dietary quality (Arimond & Ruel, 2004).

The 2012 Ghana FTF-PBS survey only recorded whether or not the food items were consumed and not the amount of calories in the foods. This is a limitation because both quantity and quality are needed to account for a healthy diet for children, for it has been noted

that the nutritional content of high dietary diversity may vary according to local diet patterns (Arimond & Ruel, 2004).

Also, the household hunger scale has one limitation. The scale only measures a recall of food inaccessibility and food insecurity situations for a month. The problem is that food security status of a household may be seasonal, and it may not reveal chronic food insecurity conditions in households in the northern regions of Ghana.

Another limitation of this study is that it used data from cross sectional surveys, therefore the analyses have not been able to establish any complex causal relationships. The conclusions in this study are therefore restricted to associations between the predictor measures and the outcome measures.

5.5 Conclusion and Implication

5.5.1 Main Conclusion

The study investigated the relationship between level of household food security and complementary feeding practices—MMF, MDD, and MAD—in northern regions of Ghana. The study addressed three research questions. The questions and their corresponding conclusions are as follows:

1. What is the relationship between the level of household food security and infant and young child complementary feeding practices—MMF, MDD, MAD—in the northern regions of Ghana? The main conclusion is that household food security has a modest but statistically significant association with MDD and MAD but not with MMF.
2. What is the relationship between child sex and age and complementary feeding practices in the northern regions of Ghana? The main conclusion is that child age was a significant predictor of MDD and MAD but not of MMF. Compared with children 6-11 months, 12-17 month old and 18-23 month old children were significantly more likely to receive MDD and MAD. Child sex is not important in relation with child complementary feeding practices.
3. What is the relationship between socio-demographic characteristics and infant and young child feeding practices in the northern regions of Ghana? The main conclusion is that there was statistically significant positive association between region of residence (Upper West) and certain measures of child complementary feeding (MMF and MDD). Also, children living in small households were significantly more likely to receive adequate complementary feeding.

5.5.2 Contribution of the results to the Model of Child Care

The main contribution of the study to the Model of Childcare is the establishing of one of its core assumptions: the relationship between food security resources and achievement of child complementary feeding practices.

5.5.2 Implication for health promotion practice

While household food security was related to two measures of child feeding adequacy (MDD and MAD), there were instances of underfed children in food secure households and of well-fed children in food insecure households in northern Ghana. These results call for a further study of these groups, which may shed light on how health promotion practitioners can enable caregivers to achieve adequate child feeding, irrespective of the household's food security situation. The results also suggest that interventions addressing the whole population, rather than targeting vulnerable[6] groups, might be more effective in promoting child complementary feeding practices.

Maternal dietary diversity positively relates with MDD and MAD. This implies that promoting maternal complementary feeding practices might translate into adequate child complementary feeding practices in northern regions of Ghana.

Children within the youngest age group were at risk of being underfed, but the fact that there were cases of inadequate complementary feeding in the older age group implies that public health promotion interventions should adopt an all-inclusive approach in addressing child underfeeding in northern regions of Ghana; every child in every household matters.

5.5.3 Recommendation for further research

The main household food security measure dealt with accessibility to and availability of resources at the household level. The measure did not capture the other components of food security resources (area food availability, household feeding priorities, and food aid) in the Model of Childcare. Therefore, a further study should be conducted in order to generate a measure that captures all the components of food security resources in the Model of Childcare.

[6] Many of the USAID sponsored interventions in the northern regions of Ghana targets only vulnerable households, an approach that has neglect children that are inadequately fed and malnourished in invulnerable households as demonstrated in this study. RING Project and the SPRING Project are two examples. The RING Project is improving livelihood and nutritional status of vulnerable households in targeted communities in 17 districts in the Northern Region (http://www.jsi.com/JSIInternet/IntlHealth/project/display.cfm?ctid=na&cid=na&tid=40&id=20141). The SPRING project also target about 150 vulnerable communities in 15 districts in the Northern and Upper East Regions (https://www.spring-nutrition.org/about-us/activities/interactive-map-springghana-target-communities-and-supported-health-facilities).

This study has not established a causal link between household food security and child complementary feeding practices, for it used a cross-sectional survey data. Therefore, a longitudinal cohort study design is needed in order to establish causality.

In this study and many other studies, young children (6-11 months) were often at risk of being underfed; therefore, a qualitative study should explore what informs primary caregivers feeding practices in the northern regions of Ghana.

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APPENDIX A : FTF-PBS QUESTIONNAIRE

MONITORING, EVALUATION TECHNICAL SUPPORT SERVICES (METSS)
GHANA FEED THE FUTURE ZONE OF INFLUENCE SURVEY
BASELINE SURVEY QUESTIONNAIRE
VIST I

Version 05
29 JULY 2012

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Visit 1- Module 1: Household Identification Data (FTF Module A)

1.01 Enumerator Identification Number?

	Not Listed		*019*		*038*		*057*		*076*
	001		*020*		*039*		*058*		*077*
	002		*021*		*040*		*059*		*078*
	003		*022*		*041*		*060*		*079*
	004		*023*		*042*		*061*		*080*
	005		*024*		*043*		*062*		*081*
	006		*025*		*044*		*063*		*082*
	007		*026*		*045*		*064*		*083*
	008		*027*		*046*		*065*		*084*
	009		*028*		*047*		*066*		*085*
	010		*029*		*058*		*067*		*086*
	011		*030*		*049*		*068*		*087*
	012		*031*		*050*		*069*		*088*
	013		*032*		*051*		*070*		*089*
	014		*033*		*052*		*071*		*090*
	015		*034*		*053*		*072*		*091*
	016		*035*		*054*		*073*		*092*
	017		*036*		*055*		*074*		*093*
	018		*037*		*056*		*075*		*094*

Name of enumerator not listed (write in name)

0

NOTE TO ENUMERATOR: Within each Enumeration Area, your team will interview 20 households. Locate and interview the list of households assigned to you by your supervisor. If after two attempts you are unsuccessful in obtaining audience, report the case to your supervisor for the next line of action. Do not complete questions 1.08 and 1.09 until after completing Module II. All applicable questionnaire sections should be asked of all appropriate household members. Pay attention to the skip patterns and follow Fill out the consent form on the next page. If the household agrees to continue with the survey, continue to complete the questionnaire until any respondent refuses to continue, then stop or move to another respondent/modules as appropriate.

Household Identification	**Code**
1.02. Region:	☐☐
1.03.District:	☐☐
1.04 Community/Village Name:	
1.05. EA Number	☐☐☐
1.06. Household Number	☐☐
1.08. Name of primary respondent (code from roster in Module 2): **Surname, First Name:**.....	☐☐
1.09. Name of secondary respondent (code from roster in Module 2): **Surname, First Name:**.....	☐☐
1.10. Type of household:	☐
1.11.Main religion of household (See codes below):	☐

Enumerator Code		
1.13 GPS Coordinates of household Household latitude ☐☐.☐☐☐☐☐ Household longitude ☐☐☐.☐☐☐☐☐		
Visit	Date DD / MM	Interview start and end time (24HR)
Visit I	__ __ / __ __	START: HH ___MM___ END: HH ___MM___
Visit II	__ __ / __ __	START: HH ___MM___ END: HH ___MM___
Visit III	__ __ / __ __	START: HH ___MM___ END: HH ___MM___
1.18. Name/code of supervisor:		☐
1.19. Final outcome of interview (enter code)		☐

1.12. Main ethnic group of the household (enter code):			

Codes for questions in table above

1.02 Region Codes	**1.03: Districts Codes for Northern Region**		**1.03: Districts Codes for Upper East Region**	**1.03: Districts Codes for Upper West Region**
07 – Brong Ahafo	Bole/Bamboi - 01	Nanumba South - 11	Bawku Municipal - 21	Jirapa - 30
08 - Northern Region	Bunkpurugu/Yunyoo - 02	Saboba - 12	Bawku West - 22	Lambussie Karni - 31
09 - Upper East Region	Central Gonja - 03	Savelugu/Nanton - 13	Bolgatanga Municipal - 23	Lawra - 32
10 - Upper West Region	Chereponi - 04	Sawla/Tuna/Kalba - 14	Bongo - 24	Nadowli - 33
	East Gonja - 05	Tamale Metro - 15	Builsa - 25	Sissala East - 34
	East Mamprusi - 06	Tolon/Kumbungu - 16	Garu/Tempane - 26	Sissala West -35
	Gusheigu - 07	West Gonja - 17	Kassena Nankana - 27	Wa East - 36
	Karaga - 08	West Mamprusi - 18	Kassena Nankana West - 28	Wa Municipal - 37
	Kpandai - 09	Yendi Muni - 19	Talensi Nabdam - 29	Wa West - 38
	Nanumba North - 10	Zabzugu/Tatali - 20		

1.03: Districts Codes for Brong Ahafo Region	**1.10: Household Type Code**	**1.11: Main Religion**	**A12: Main ethnic Group**
Jaman North - 39	1 - Male and Female adult **(M&F)**	1 - No Religion	Akan -01
Kintampo North Municipal -40	2 - Female adult only **(FNM)**	2 - Catholic	Ga-Dangme -02
Kintampo South -41	3 - Male adult only **(MNF)**	3 - Protestant (Anglican, Lutheran, Presbyterian, Methodist etc)	Ewe -03
Pru -42	4 - Child only household **(CNA)**	4 - Pentecostal/Charismatic	Guan -04
Sene -43		5 - Other Christian	Mole-Dagbani -05
Tain -44		6 - Islam	Grusi -06
Wenchi Municipal -45		7 - Traditionalist	Mande -07
		8 - Other (specify)	Gurma -08
			Other -09
1.19. Final outcome of interview (enter code)			

1 - Completed 2 - No household member or no competent respondent at home during all visits 3 - Entire household absent for extended period of time 4 - Refused 5 - Dwelling destroyed 6 - Dwelling not found 7 – Other (specify)_____	

Visit 1- Module 1 Continued: Informed Consent (FTF Module B)

TO THE ENUMERATOR:
Administer the consent form to each eligible respondent.

1.24. Do you [NAME] agree to participate in the study?

Note to Enumerator: *The primary respondent is ideally the person with the most decision making authority in the household. The secondary respondent is the person of opposite sex to the primary respondent with the most decision making authority in the household. Refer to manual on details of who the secondary and primary respondent could be.*

1. Respondent Number *(from HH Listing)*	2. Type of Respondent	3. Name of Respondent	4. Status of Participation 1 - Yes (Participate) 2 - No>>End Survey	5. Signature Mark	6. Cell Phone Number
	Primary Respondent				
	Secondary Respondent				
	Other Respondent 1				
	Other Respondent 2				
	Other Respondent 3				

I _____, the enumerator responsible for the interview taking place on _____, 2012 certify that I have read the above statement to the participant(s) and they have consented to the interview. I pledge to conduct this interview as indicated on instructions and inform my supervisor of any problems encountered during the interview process.

KANSAS STATE UNIVERSITY

INFORMED CONSENT FORM

PROJECT TITLE: FTF Ghana Population-Based Survey in Northern Ghana: Baseline

APPROVAL DATE OF PROJECT: 6/2012 **EXPIRATION DATE OF PROJECT:** 6/2013

PRINCIPAL INVESTIGATOR: CO-INVESTIGATOR(S):
Dr. Tim Dalton, Kansas State University (KSU), USA
Dr. Vincent Amanor-Boadu, KSU, USA
Dr. Nina Lilja, KSU, USA

CONTACT AND PHONE FOR ANY PROBLEMS/ QUESTIONS:

Ghanaian Contacts –
Patrick Fosu-siaw (Project Coordinator) or Dr. Adeline Ofori-Bah (Chief of Party)
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IRB CHAIR CONTACT/ PHONE INFORMATION:
Rich Schiedt, Chair, Committee on Research Involving Human Subjects, 203 Fairchild Hall, Kansas State University, Manhattan, KS 66506, USA, 1-785-532-3224

SPONSOR OF PROJECT:
United States Department of Agriculture (USDA) through Participating Agency Service Agreement (PASA) with the United States Agency for International Development (USAID)

PURPOSE OF THE RESEARCH:
This is a research project designed to collect information on your household's economic activities, agricultural activities, food choices and eating practices, nutrition, and women and men's roles in household activities. The information collected in this survey will help determine the effectiveness of public assistance programs designed to reduce poverty, reduce hunger, and improve nutrition for people in your region of Ghana.

PROCEDURES OR METHODS TO BE USED:
Surveyors from the Institute of Statistical, Social, and Economic Research (ISSER) will ask you questions and record your answers in a laptop computer. Surveyors will come visit your household at least twice and they will ask questions from you and various other family members. Each survey visit will take approximately 40 min. – 2 hrs. to complete. With your permission, surveyors will also take height and weight measurements of you and your family members.

During our initial visit, we will ask for phone contact information in case we need to contact you to make arrangements for our 2nd visit or if we are interrupted during the first visit and need to schedule completion of the survey at a later date and time. You may still participate in the survey if you do not have a phone or if you do not want to give us your phone information.

URCO

JUN 15 12

ALTERNATIVE PROCEDURES OR TREATMENTS, IF ANY, THAT MIGHT BE ADVANTAGEOUS TO SUBJECT:
none

LENGTH OF STUDY: The field work portion of this project is expected to take about six weeks.

RISKS ANTICIPATED: There are no known risks associated with your participation in this project. We appreciate that this is a busy farming season for you and understand that your participation in the survey may cause you to miss approximately 40 min. to 2 hrs. of field work because of each visit. If you need to take a break for rest or to take care of something, please inform your interviewers and they will stop when you wish.

BENEFITS ANTICIPATED: The project benefits society as a whole in that the collection of this information meets with United States aid funding requirements and, when these requirements are met, United States funded aid programs are allowed to operate in the region. Hopefully these programs will improve people's quality of life.

EXTENT OF CONFIDENTIALITY: If you wish, you may participate in the survey without providing your name or phone number to the surveyor. If you do provide your name and/or contact information, all of your responses to this questionnaire will remain completely confidential and nothing will ever be published/reported/ presented, etc. that associates your names, phone numbers, and/or residential location with your responses to the survey questions. The only reason you would be contacted again in the future about this survey is if we are interrupted and need to make arrangements to complete the survey at a later date and time.

In all distributed datasets and reports that result from this survey, all household responses like yours will be associated with a unique household identification number that can never be linked to you. The only people that will ever have access to survey information containing identifiers of your household are the surveyors and project researchers and all have signed agreements promising to keep your data confidential.

IS COMPENSATION OR MEDICAL TREATMENT AVAILABLE IF INJURY OCCURS: Not applicable since this project poses no more than minimal risk to participants.

PARENTAL APPROVAL FOR MINORS:
(No parental consent is required for minors under 18 that have no parent present in the household. See parental consent waiver justification on approved IRB application.)

TERMS OF PARTICIPATION: I understand this project is research, and that my participation is completely voluntary. I also understand that if I decide to participate in this study, I may withdraw my consent at any time, and stop participating at any time without explanation, penalty, or loss of benefits to which I may otherwise be entitled.

I verify that my signature below indicates that I have read and understand this consent form (or that this consent form as been read to me), and willingly agree to participate in this study under the terms described, and that my signature acknowledges that I have received a signed and dated copy of this consent form.

Participant Name: _____

Participant Signature: _____ **Date:** _____

Witness to Signature: (project staff) _____ **Date:** _____

URCO

Last revised on May 20, 2004

Visit 1- Module 2: Household Demographics (FTF Module C)

Instruction to Enumerators: Ask these questions about all household members. Ask the primary or secondary respondent, whoever is most knowledgeable about the age, completed education, and other characteristics of household members.

Enumerator Reads: First, we would like to ask you about each member of your household. Please list the names of everyone considered to be a member of this household, starting with you (the primary respondent), followed by the secondary respondent and all other person:

ID Code	Name of household member? [start with primary respondent, continue with the secondary respondent, if applicable, and other members]	What is [NAME's] sex? 1 = M 2 = F	What is [NAME's] relationship to the primary respondent?	What is [NAME's] age? **If < 2 yrs enter # of months** **If <3 yrs , skip 2.06-2.10**		What is [NAME's] civil or marital status?	Can [NAME] read and write in English	What other language can you read and write	Has [NAME] ever attended school? 1= Yes 2= No>>next member	Is [NAME] currently attending school? 1 = Yes 2 = No	What is the highest qualification completed by [NAME]?
				Number	**Unit**						
	2.01	**2.02**	**2.03**	**2.04**	**2.05**	**2.06**	**2.07**	**2.07a**	**2.08**	**2.09**	**2.10**
01											
02											
03											
04											
05											
06											
07											
08											
09											
10											

Visit 1- Module 2: Household Demographics (FTF Module C) Continued

ID Code	Name of household member? [start with primary respondent, continue with the secondary respondent, if applicable, and other members]	What is [NAME's] sex? 1 = M 2 = F	What is [NAME's] relationship to the primary respondent?	What is [NAME's] age? **If < 2 yrs enter # of months** **If <3 yrs , skip 2.06-2.10**		What is [NAME's] civil or marital status?	Can [NAME] read and write in English	What other language can you read and write	Has [NAME] ever attended school? 1= Yes 2= No>>next member	Is [NAME] currently attending school? 1 = Yes 2 = No	What is the highest qualification completed by [NAME]?
				Number	Unit						
	2.01	**2.02**	**2.03**	**2.04**	**2.05**	**2.06**	**2.07**	**2.07a**	**2.08**	**2.09**	**2.10**
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											

Codes for Questions in Phase 1- Module 2: Household Demographics

2.03: Relationship to primary respondent	2.05: Unit	2.06: Marital/Civil Status	2.07: Literacy	2.07a	2.10: Education level
1 - Primary respondent 2 - Spouse (Wife/Husband) 3 - Child (Son/daughter) 4 - Parent/Parent in-law 5 - Son/Daughter in-law 6 - Grandchild 7 - Brother/Sister 8 - Step child 9 - Foster child 10 - Other relative 11 - Non-relative	1 - Months 2 - Year	1 - Never married/Single 2 - Informal/consensual union/living together 3 - Married 4 - Separated 5 - Divorced 6 – Widowed	1 - Cannot read and write 2 - Can write only 3 - Can read only 4 - Can read and write	1- None 2- Can read and write local language 3- Can read local language only 4- Can write local language only 5- Can read and write Arabic 6- Can read Arabic only 7- Can write Arabic only	1 - None 2 - MLSC 3 - BECE 4 - Voc/Comm 5 - Teacher Tra. A 6 - Teacher Post Sec 7 - GCE O Level 8 - SSCE /WASSCE 9 - GCE A Level 10 - Tech/Prof Cert 11 - Tech/Prof Dip 12 - HND 13 - Bachelors 14 - Masters 15 - Doctorate 16 - Other (specify)

Visit 1- Module 3A: Household Hunger Scale (FTF Module H.)

Enumerator: Ask of the person responsible for Household Food Preparation.

No.	Question	Response Code
3.01	In the last 4 weeks, was there ever no food to eat of any kind in your dwelling because of lack of resources to get food?	1 = Yes 2 = No >>3.03
3.02	How often did this happen in the last 4 weeks?	1 = Rarely (1-2 times) 2 = Sometimes (3-10 times) 3 = Often (more than 10 times
3.03	In the last 4 weeks, did you or any household member go to sleep at night hungry because there was not enough food?	1 = Yes 2 = No>>3.05
3.04	How often did this happen in the last 4 weeks?	1 = Rarely (1-2 times) 2 = Sometimes (3-10 times) 3 = Often (more than10 times
3.05	In the last 4 weeks, did you or any household member go a whole day and night without eating anything at all because there was not enough food?	1 = Yes 2 = No >>end of module
3.06	How often did this happen in the last 4 weeks?	1 = Rarely (1-2 times) 2 = Sometimes (3-10 times) 3 = Often (more than 10 times)

Visit 1- Module 3B: Cultivation of Key Crops

Crop	**3b.1** Did household cultivate any of these crops during the immediate past cropping season? Yes – 1 No - 2 >> Next crop	3b.2 What was the approximate size of land cultivated?		3b.3 What was the quantity of crop produced?		3b.4 Income from crop sales **NB: Quantity should be in same unit as 3b.3**	
		Quantity	Unit . **1-Poles 2-Acres 3-Plots 4-Hect. 5-Mtr sqr**	Quantity	Unit **1-Mxbag, 2-Mnbag 3-Tonnes**	Quantity (If no sales >>Next crop)	Income (GH₵)
Maize							
Rice							
Soya							

Visit 1- Module 4: Women's Dietary Diversity (FTF Module J.)

Enumerator Instructions: Ask these questions of each woman of reproductive age (15-49 years) in the household. Check to see if consent to be interviewed has already been given on the cover sheet, if it has not, you must obtain permission from EACH eligible woman.

Enumerator reads to respondent: We would like to ask you permission to ask questions about your diet. Your participation is voluntary and you may stop at any time. Your responses will be kept confidential.

Respondent ID (from HH Roster) **4.00A**	Respondent Name **4.00B**	**Enumerator Instruction:** Ask this question only if consent has not already been obtained in Module 1 Do you agree to participate in the survey? 1 = Yes → *Continue with questions* 2 = No → *STOP survey for this woman, move to next women, if none END MODULE* **4.00C**	Signature/Thumbprint **4.00D**

Respondent (Female 15-49 years) ID Code	In what month and year were you born?		What was your age at your last birthday? **RECORD AGE IN COMPLETED YEARS**	IS THE RESPONDENT BETWEEN THE AGES OF 15 AND 49 YEARS? **IF THE INFORMATION IN 4.02 / 4.03 AND 4.04 CONFLICTS, DETERMINE WHICH IS MOST ACCURATE** Yes = 1 No = 2 (>> next woman or end module)
	Month (mm)	Year (YYYY)		
4.01	**4.02**	**4.03**	**4.04**	**4.05**

Codes for Months

Jan = 01 Feb = 02 Mar = 03	April = 04 May = 05 June = 06	July = 07 Aug = 08 Sep = 09	Oct = 10 Nov = 11 Dec = 12

Enumerator Instruction: Ask these questions of each woman of reproductive age (15-49 years). Accurate responses to this question may require probing. Use the probes below to elicit a more thorough listing of what the respondent ate yesterday.

Enumerator Ask: Now I will like to ask you about (other) liquids or foods that you ate yesterday, during the day or night. I [Enumerator] am interested in whether you ate the item even if it was combined with other foods. Please describe everything that you ate yesterday during the day or night, whether at home or outside the home.

1. Think about when you first woke up yesterday. Did you eat anything at that time? If YES: Please tell me everything you ate at that time. PROBE: Anything else? Until respondent says nothing else. If NO, continue to next question
2. What did you do after that? Did you eat anything at that time? If YES: Please tell me everything you ate at that time. PROBE: Anything else? Until respondent says nothing else. Repeat question b) above until respondent says she went to sleep until the next day. If respondent mentions mixed dishes like a porridge sauce or stew, probe:
3. What ingredients were in that (MIXED DISH)? PROBE: Anything else? Until respondent says nothing else

Enumerator Instruction: As the respondent recalls foods, tick the corresponding food and enter '1' in the column next to the food group for the particular woman interviewed. If the food is not listed in any of the food groups below, write the food in 4.27 labeled 'other foods'. If foods are used in small amounts for seasoning or as a condiment, they should be included in 4.24 Condiments.

Once the respondent finishes recalling foods eaten, read each food group where '1' was not circled, ask the following question and enter '1' if respondent says yes, '2' if no and '98' if don't know: Yesterday during the day or night, did you drink/eat any (FOOD GROUP ITEMS)?

No.	Questions	Codes		Woman I	Woman II	Woman III	Woman IV	Woman V
		Yes = 1 No = 2 DK/NR = 98	HH ID from Roster →					
4.6	Milk such as tinned, powdered, or fresh animal milk,	[redacted]						
4.7	Tea or coffee							
4.8	Any other liquids (juice, cocoa)							
4.10	Bread, rice, noodles, or other foods made from grains (kenkey, banku, koko, tuo zaafi, akple, weanimix)							
4.11	Pumpkin, red or yellow yams, carrots, sweet potatoes that are yellow or orange inside							
4.12	White potatoes, white yams, manioc, cassava, cocoyam, fufu or any other foods made from roots, tubers or plantain							
4.13	Any dark green, leafy vegetables (kontomire, aleefu, ayoyo, kale, cassava leaves)							
4.14	Ripe mangoes, pawpaw							
4.15	Any other fruits or vegetables [e.g. bananas, avocados, tomatoes, oranges, apples]							
4.16	Liver, kidney, heart or other organ meats							
4.17	Any meat, such as beef, pork, lamb, goat, chicken, or duck							
4.18	Eggs							
4.19	Fresh or dried fish or shellfish [e.g. prawn, lobster]							
4.20	Any foods made from beans, peas, lentils, nuts, or seeds							

4.21	Yogurt, cheese, or other milk products	[redacted]					
4.22	Any oil, fats, or butter, or foods made with any of these						
4.23	Any sugary foods such as chocolates, sweets, candies, pastries, cakes, or biscuits						
4.24	Condiments for flavor, such as chilies, spices, herbs or fish powder						
4.25	Grubs, snails or insects						
4.26	Foods made with red palm oil, red palm nut, or red palm nut pulp sauce						
4.27	***OTHER FOODS*: PLEASE WRITE DOWN OTHER FOODS IN THIS BOX THAT RESPONDENT MENTIONED BUT ARE NOT INCLUDED IN ANY OF THE FOOD GROUPS ABOVE:**						

Visit 1- Module 5: Children's Minimum Acceptable Diet (FTF Module L)

Enumerator Instructions: Ask of Caregivers of each Child **aged 6-23 Months** in Household. Check to see if consent to be interviewed has already been given on the cover sheet, if it has not, you must obtain permission from EACH woman/caregiver of the child. Ensure that the consent covers for children 0-5 months to enable for data collection for module 6 below.

Enumerator read to respondent: We would like to ask you permission to ask questions about your children and their diet. Your participation is voluntary and you may stop at any time. Your responses will be kept confidential.

1. Mother or Primary Caregiver's ID (from HH Roster)	2. Respondent (CAREGIVER'S) Name	3. Do you agree to participate in the survey? 1 = Yes → *Continue with questions* 2 = No → *STOP survey for this woman, move to next women, if none END MODULE*	4. Signature/Thumbprint

No	Question	Response Code	Response				
			Child I	Child II	Child III	Child IV	Child V
5.01	MOTHER/CAREGIVER'S ID CODE FROM THE HH ROSTER						
5.02	CHILD'S ID CODE FROM THE HH ROSTER						
5.03	CHILD'S SEX FROM THE HH ROSTER	1 - Male 2 - Female					
5.04	What is ***(CHILD'S NAME)*** full date of birth (dd/mm/yyyy)? If the respondent does not know the exact birth date, ask for (Child's Name) health/vaccination card and record the correct birth date.	DD					
		MM					
		YYYY					
5.05	How old was ***(CHILD'S NAME)*** at his/her last birthday? ***RECORD AGE IN COMPLETED YEARS***.	0 - less than 1 year 1 - 1 year 2 - 2 or more years					
5.06	How many months old is ***(CHILD'S NAME)***? ***RECORD AGE IN COMPLETED MONTHS.***	Months					
5.07	***CHECK QUESTIONS 5.04, 5.05 AND 5.06 TO VERIFY CONSISTENCY.*** If the answer is 'NO', resolve any inconsistencies. If the birth date was recorded on a health card, this may be used as the correct data source.						
5.07A	Is the year recorded in **5.04** consistent with age in years recorded in **5.05**?	1 - Yes 2 - No					
5.07B	Are year and month of birth recorded **in 5.04** consistent with age in months recorded in **5.06**?	1 - Yes 2 - No					
5.08	Check question **5.06**. is the child equal to or older than 6 months and less than 24 months?	1 - Yes >> continue with module 2 - No >>next child/ end module 98 - DK/ NA >> next child/end module					

No	Question	Response Code	Response				
			Child I	Child II	Child III	Child IV	Child V
5.09	Has ***(CHILD'S NAME)*** ever been breastfed?	1 - Yes 2 - No >> skip to 5.11 98 - DK/NA >> skip to 5.11					
5.10	Was ***(CHILD'S NAME)*** breastfed yesterday during the day or at night?	1 - Yes >> skip to 5.12 2 - No 98 - DK/NA					
5.11	Sometimes babies are fed breast milk in different ways, for example by spoon, cup or bottle. This can happen when the mother cannot always be with her baby. Sometimes babies are breastfed by another woman, or given breast milk from another woman by spoon, cup or bottle or some other way. This can happen if a mother cannot breastfeed her own baby. Did ***(CHILD'S NAME)*** consume breast milk in any of these ways yesterday during the day or at night?	1 - Yes 2 - No 98 - DK/NR					
5.12	Now I would like to ask you about some medicines and vitamins that are sometimes given to infants. Was ***(CHILD'S NAME)*** given any vitamin drops or other medicines as drops yesterday during the day or at night?	1 - Yes 2 - No 98 - DK/NR					
5.13	Was ***(CHILD'S NAME)*** given **ORS** yesterday during the day or at night?	1 - Yes 2 - No 98 - DK/NR					

No	Question	Response Code	Response				
			Child I	Child II	Child III	Child IV	Child V
Enumerator Ask: Now I would like to ask you about (other) liquids or foods that your child ate yesterday during the day or at night. I am interested in whether they ate the item even if it was combined with other foods. Please describe everything he or she ate yesterday during the day or night, whether at home or outside the home. Next I would like to ask you about some liquids that ***(CHILD'S NAME)*** may have had yesterday during the day or at night.							
5.14	Plain water?	1 – Yes 2 - No 98 - DK/NR					
5.15	Infant formula such as winning mix or commercially produced infant formula?	1 – Yes 2 - No >> skip to 5.17 98 - DK/NR >> skip to 5.17					
5.16	How many times **(*number*)** yesterday during the day or at night did ***(CHILD'S NAME)*** consume any formula?	98 - Don't know					
5.17	Milk such as tinned, powdered, or fresh animal milk?	1 – Yes 2 - No >> skip to 5.19 98 - DK/NR >> skip to 5.19					
5.18	How many times **(*number*)** yesterday during the day or at night did ***(CHILD'S NAME)*** consume any milk?	98-= Don't know					
5.19	Juice or juice drinks?	1 – Yes 2 - No					
5.20	Clear broth?	98 - DK/NR					
5.21	Yogurt?	1 – Yes 2 - No >> skip to 5.23 98 - DK/NR >> skip to 5.23					
5.22	How many times **(*number*)** yesterday during the day or at night did ***(CHILD'S NAME)*** consume any yogurt?	98-= Don't know					
5.23	Thin porridge?	1 - Yes 2 - No					
5.24	Any other liquids. Specify	98 - DK/NR					

No	Question	Response Code	Response				
			Child I	Child II	Child III	Child IV	Child V
Now I would like to ask you about (other) liquids or foods that your child ate yesterday during the day or at night. I am interested in whether they ate the item even if it was combined with other foods. Please describe everything he or she ate yesterday during the day of night, whether at home or outside the home. **Enumerators should probe until respondent says child went to sleep at night.** **Consumption Questions:** Ask these questions of each caregiver for the children 6 – 23 months old under his or her care. Accurate responses to this question may require probing. Use the probes to elicit a more thorough listing of what the respondent ate yesterday. 1. Think about when you first woke up yesterday. Did your child eat anything at that time? If YES: Please tell me everything your child ate at that time. PROBE: Anything else? Until respondent says nothing else. If NO, continue to part 2) 2. What did your child do after that? Did your child eat anything at that time? If YES: Please tell me everything your child ate at that time. PROBE: Anything else? Until respondent says nothing else. Repeat question PART 2 above until respondent says the child went to sleep until the next day. If respondent mentions mixed dishes like a PORRIDGE, sauce or stew, probe: 3. What ingredients were in that (MIXED DISH)? PROBE: Anything else? Until respondent says nothing else. As the respondent recalls foods, tick the corresponding food and enter '1' in the column next to the food group for the child being interviewed. If the food is not listed in any of the food groups below, write the food in 5.42 the box labeled 'other foods'. If foods are used in small amounts for seasoning or as a condiment, count them under 5.39 Condiments. Once the respondent finishes recalling foods eaten, read each food group where '1' was not indicated, ask the following question and enter '1' if respondent says yes, '2' if no and '98' if don't know: Yesterday during the day or night, did your child drink/eat any (FOOD GROUP ITEMS)?							
5.25	Bread, rice, noodles, porridge or other foods made from grains (kenkey, banku, koko, tuo zaafi, akple)	**Response Code** 1 - Yes 2 - No 98 - DK/NR					
5.26	Pumpkin, red or yellow yams, carrots, sweet potatoes that are yellow or orange inside						
5.27	White potatoes, white yams, manioc, cassava, cocoyam, fufu or any other foods made from roots, tubers or plantain						
5.28	Any dark green, leafy vegetables (kontomire, aleefu, ayoyo, kale, cassava leaves)						
5.29	Ripe mangoes, pawpaw						
5.30	Any other fruits or vegetables [e.g. bananas, avocados, tomatoes, oranges, apples]						
5.32	Any meat, such as beef, pork, lamb, goat, chicken, or duck						

No	Question	Response Code	Response				
			Child I	Child II	Child III	Child IV	Child V
5.33	Eggs	1 - Yes 2 - No 98 - DK/NR					
5.34	Fresh or dried fish or shellfish [e.g. prawn, lobster]						
5.35	Any foods made from beans, peas, lentils, nuts, or seeds						
5.36	yogurt, cheese, or other milk products						
5.37	Any oil, fats, or butter, or foods made with any of these						
5.38	Any sugary foods such as chocolates, sweets, candies, pastries, cakes, or biscuits						
5.39	Condiments for flavor, such as peppers, spices, herbs or fish powder						
5.40	Grubs, snails or insects						
5.41	Foods made with red palm oil, red palm nut, or red palm nut pulp sauce						
5.42	**OTHER FOODS: PLEASE WRITE DOWN OTHER FOODS IN THIS BOX THAT RESPONDENT MENTIONED BUT ARE NOT INCLUDED IN THE FOOD GROUPS LISTED ABOVE:**						
	CHECK CATEGORIES 5.25-5.41	If at least one 'YES' or all 'DK/NR'>>5.44 If all 'NO'>>5.43					
5.43	Did ***(CHILD'S NAME)*** eat any solid, semi-solid, or soft foods yesterday during the day or at night? ***IF 'YES' PROBE***: What kind of solid, semi-solid, or soft foods did ***(CHILD'S NAME)*** eat?	Yes = 1 >> go back to 5.25-5.41 and record foods eaten. Then continue with 5.44 No = 2 >> next child/end module DK/NR = 98 >> next child/end module					
5.44	How many times **(number)** did ***(CHILD'S NAME)*** eat solid, semi-solid, or soft foods other than liquids yesterday during the day or at night?	98 - Don't know					

Visit 1- Module 6: Exclusive Breastfeeding (FTF Module K)

Enumerator: Ask of Caregivers of each child aged 0-5 months (up to end of five months old, less than six months) in Household.

No	Question	Response Code	Response				
			Child I	Child II	Child III	Child IV	Child V
6.01	MOTHER/CAREGIVER ID CODE FROM THE HH ROSTER						
6.02	CHILD'S ID CODE FROM THE HH ROSTER						
6.03	CHILD'S SEX FROM THE HH ROSTER	1 - Male 2 - Female					
6.04	What is ***(CHILD'S NAME)*** full date of birth (dd/mm/yyyy)? If the respondent does not know the exact birth date, ask for (Child's Name) health/vaccination card and record the correct birth date. If day is not known, record "98" for Day	DD					
		MM					
		YYY					
6.05	How many months old is ***(NAME)***? ***RECORD AGE IN COMPLETED MONTHS***	Months					
6.06	***CHECK QUESTIONS 6.04 AND 6.05 TO VERIFY CONSISTENCY*** If the answer to 6.06A or 6.06B is 'NO', resolve any inconsistencies. If the birth date was recorded on a health card, this may be used as the correct data source.						
6.07	Are year and month of birth recorded **in 6.04** consistent with age in months recorded in 6.**05**?	1 - Yes 2 - No					
6.08	check question **6.06** and **6.07:** Is the child less than 6 months (i.e. 0-5 months?	1 - Yes >> continue 2 - No >> next child/ end module 98 - DK >> next child/end module					

No	Question	Response Code	Response				
			Child I	Child II	Child III	Child IV	Child V
6.09	Has ***(CHILD'S NAME)*** ever been breastfed?	1 - Yes 2 - No >> 6.11 98 - DK/NR >> 6.11					
6.10	Was ***(CHILD'S NAME)*** breastfed yesterday during the day or at night?	1 - Yes >> 6.12 2 - No 98 - DK/NR					
6.11	Sometimes babies are fed breast milk in different ways, for example by spoon, cup or bottle. This can happen when the mother cannot always be with her baby. Sometimes babies are breastfed by another woman, or given breast milk from another woman by spoon, cup or bottle or some other way. This can happen if a mother cannot breastfeed her own baby. Did ***(CHILD'S NAME)*** consume breast milk in any of these ways yesterday during the day or at night?	1 - Yes 2 - No 98 - DK/NR					
6.12	Now I would like to ask you about some medicines and vitamins that are sometimes given to infants. Was ***(CHILD'S NAME)*** given any vitamin drops or other medicines as drops yesterday during the day or at night?	1 - Yes 2 - No 98 - DK/NR					
6.13	Was ***(CHILD'S NAME)*** given **ORS** yesterday during the day or at night?						

Consumption Questions: **NOTE TO ENUMERATOR**: ***READ THE QUESTIONS BELOW. READ THE LIST OF LIQUIDS ONE BY ONE AND MARK YES OR NO, ACCORDINGLY.***

Next I would like to ask you about some liquids that ***(CHILD'S NAME)*** may have had yesterday during the day or at night. Did ***(CHILD'S NAME)*** have any (***ITEM FROM LIST***)?: ***READ THE LIST OF LIQUIDS STARTING WITH 'PLAIN WATER'***

6.14	Plain water?	1 - Yes 2 - No 98 - DK/NR					
6.15	Infant formula such as winning mix or commercially produced infant formula?						
6.16	Milk such as tinned, powdered, or fresh animal milk?						
6.17	Juice or juice drinks?						
6.18	Clear broth?						
No	Question	Response Code	Response				
			Child I	Child II	Child III	Child IV	Child V
6.19	Yogurt?	1 - Yes 2 - No 98 - DK/NR					
6.20	Thin porridge?						
6.21	Any other liquids? Specify:						

ENUMERATOR:

Please describe everything that ***(CHILD'S NAME)*** ate yesterday during the day or night, whether at home or outside the home.

1. Think about when ***(CHILD'S NAME)*** first woke up yesterday. Did ***(CHILD'S NAME)*** eat anything at that time? ***IF YES:*** Please tell me everything ***(CHILD'S NAME)*** ate at that time. ***PROBE***: Anything else? ***UNTIL RESPONDENT SAYSNOTHING ELSE.IF NO, CONTINUE TO PART b)***
2. What did ***(CHILD'S NAME)*** do after that? Did ***(CHILD'S NAME)*** eat anything at that time? ***IF YES:*** Please tell me everything ***(CHILD'S NAME)*** ate at that time. ***PROBE***: Anything else? ***UNTIL RESPONDENT SAYSNOTHING ELSE.***

REPEAT QUESTION 2) ABOVE UNTIL RESPONDENT SAYS THE CHILD WENT TO SLEEP UNTIL THE NEXT DAY.IF RESPONDENT MENTIONS MIXED DISHES LIKE A PORRIDGE, SAUCE OR STEW,PROBE:

3. What ingredients were in that (***MIXED DISH***)? ***PROBE***: Anything else? ***UNTIL RESPONDENT SAYSNOTHING ELSE.***

AS THE RESPONDENT RECALLS FOODS, UNDERLINE THE CORRESPONDING FOOD AND ENTER 1 IN THE RESPONSE BOX IN THE COLUMN NEXT TO THE FOOD GROUP. IF THE FOOD IS NOT LISTED IN ANY OF THE FOOD GROUPS BELOW, WRITE THE FOOD IN THE BOX LABELED 'OTHER FOODS'. IF FOODS ARE USED IN SMALL AMOUNTS FOR SEASONING OR AS A CONDIMENT, INCLUDE THEM UNDER THE CONDIMENTS FOOD GROUP.
ONCE THE RESPONDENT FINISHES RECALLING FOODS EATEN, READ EACH FOOD GROUP WHERE '1' WAS NOT ENTERED IN THE RESPONSE BOX, ASK THE FOLLOWING QUESTION AND ENTER '1' IF RESPONDENT SAYS YES, '0' IF NO AND '9' IF DON'T KNOW:

Enumerator Ask: Yesterday during the day or night, did ***(NAME)*** drink/eat any (***FOOD GROUP ITEMS***)?							
No	Question	Response Code	Response				
			Child I	Child II	Child III	Child IV	Child V
6.22	Bread, rice, noodles, porridge or other foods made from grains (kenkey, banku, koko, tuo zaafi, akple)	1 - Yes 2 - No 98 - DK/NR					
6.23	Pumpkin, red or yellow yams, carrots, sweet potatoes that are yellow or orange inside?						
6.24	White potatoes, white yams, ~~manioc~~, cassava, cocoyam, fufu or any other foods made from roots, tubers or plantain						
6.25	Any dark green, leafy vegetables (kontomire, aleefu, ayoyo, kale, cassava leaves)						
6.26	Ripe mangoes, pawpaw						
6.27	Any other fruits or vegetables [e.g. bananas, avocados, tomatoes, oranges, apples]						
6.28	Liver, kidney, heart or other organ meats						
6.29	Any meat, such as beef, pork, lamb, goat, chicken, or duck	1 - Yes 2 - No 98 - DK/NR					
6.30	Eggs						
6.31	Fresh or dried fish or shellfish [e.g. prawn, lobster]						
6.32	Any foods made from beans, peas, lentils, nuts, or seeds						
6.33	Cheese or other milk products						
6.34	Any oil, fats, or butter, or foods made with any of these						
6.35	Any sugary foods such as chocolates, sweets, candies, pastries, cakes, or biscuits						
6.36	Condiments for flavor, such as chilies, spices, herbs or fish powder						
6.37	Grubs, snails or insects						

6.38	Foods made with red palm oil, red palm nut, or red palm nut pulp sauce						
6.39	***OTHER FOODS*: PLEASE WRITE DOWN OTHER FOODS IN THIS BOX THAT RESPONDENT MENTIONED BUT ARE NOT IN THE LIST BELOW:**						
6.40	**Check Questions 6.22–6.38. If all 'NO' GO TO 6.41 If at least one 'YES' or all 'DK' GO TO 6.42**						
6.41	Did **(CHILD'S NAME)** eat any solid, semi-solid, or soft foods yesterday during the day or at night? **IF 'YES' PROBE:** What kind of solid, semi-solid, or soft foods did **(CHILD'S NAME)** eat?	1 - Yes >>go back to 6.22-6.38 and record foods eaten then continue with 6.41 2 - No >> end module 98 - DK/NR >> end module					
6.42	How many times did ***(CHILD'S NAME)*** eat solid, semi-solid, or soft foods other than liquids yesterday during the day or at night?						
	End of Module						

Visit 1- Module 7: Anthropometry for women (FTF Module M.)

Enumerator: Apply this module to each women of reproductive age (15-49 years) in the Household.

Woman's ID from HH Roster	Name of Woman	Do you agree to be measured? 1 - Yes >> Continue 2 - No >>Next woman, if none end module	**WEIGHT IN KILOGRAMS**	**HEIGHT IN CENTIMETERS**	Are you pregnant? 1 - Yes 2 - No 98 - DK
7.1	**7.2**	**7.3**	**7.4**	**7.5**	**7.6**
			☐☐.☐	☐☐☐.☐	
			☐☐.☐	☐☐☐.☐	
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			☐☐.☐	☐☐☐.☐	

Visit 1- Module 8: Anthropometry for children (FTF Module N.)

Enumerator: Apply to each child aged 0 – 59 months in the Household.

Child's ID # (from roster)	**Parent Agree to weigh and Measure child**? Yes = 1 No = 2 >> End Module	**Child Sex** 1 - Male 2 - Female	In what day, month and year was <**CHILD'S NAME**> born?			**Child's Age** (in Months)	**Child less than 60 months**? 1 - Yes 2 - No>> End Module 98 - DK/NR >> End Module	**Child's Weight** (in Kilograms)	**Child Height** (in Cm) Children < 24 mons measure lying down; children >= 24 mons measure standing up	**Child Edema** Yes = 1 No = 2
			Day (DD)	Month (MM)	Year (YYYY)					

Visit 1- Module 9: Dwelling Characteristics (FTF Module D)

Enumerator: Ask these questions about all household members. *Ask the primary or secondary respondent, whoever is most knowledgeable about the household dwelling characteristics.*

No	Question	Response	Response Codes	
9.01.	**ENUMERATOR: OBSERVE (DO NOT ASK)** Roof top material (outer covering):		1. Palm leaves/raffia/thatch 2. Wood 3. Corrugated metal sheets 4. Asbestos/slate	5. Roofing tiles 6. Mud bricks/earth 7. Bamboo 8. Other
9.02.	**ENUMERATOR: OBSERVE (DO NOT ASK)** Floor material:		1. Earth/mud/mud bricks 2. Wood 3. Stone 4. Cement/concrete 5. Burnt bricks	6. Vinyl tiles 7. Ceramic/marble tiles 8. Terrazzo 9. Other
9.03.	**ENUMERATOR: OBSERVE (DO NOT ASK)** Exterior Walls:		1. Mud/mud bricks 2. Wood/bamboo 3. Metal sheets/slate/asbestos 4. Stones 5. Burnt bricks	6. Cement/sandcrete blocks 7. Thatch 8. Cardboard 9. Other
9.04.	**ENUMERATOR: OBSERVE (DO NOT ASK)** State of the dwelling:		1. In excellent repair, no sign of wear 2. In good shape, some minor wear-and-tear or damage 3. In moderate condition, some damage and moderate wear-and-tear	4. In poor shape, much damage 5. In very bad shape
9.05.	IF THE HOUSEHOLD SHARES THE SPACE WITH OTHER HOUSEHOLDS: How many other households live in this same house or apartment? **(Enter 0 if not shared)**			
9.06.	This dwelling is [READ OPTIONS]:		1. Rented 2. Owned	3. Borrowed (no payment) 4. Other

9.07.	How many rooms are there in this dwelling? (Do not count bathrooms, hallways, garage, toilet, cellar, kitchen)		

No	Question	Response	Response Codes	
9.08.	How many rooms are used exclusively for sleeping?			
9.09.	What is the main type of toilets your household uses?		1. Flush toilet (WC) 2. Pit Latrine 3. KVIP 4. Pan/bucket	5. Public toilet (flush/bucket/KVIP) 6. Toilet in another house 7. No toilet facility (bush, beach) 8. Other
9.10.	Is there a water source inside the dwelling?		1. Yes 2. No	
9.11.	What is the main source of water for general use for your household		1. Piped into dwelling 2. Piped into plot/yard 3. Public tap (someone else's private tap) 4. Tube well/borehole 5. Protected dug well 6. Protected spring	7. Rain water collection 8. Unprotected dug well/springs 9. River/ponds/streams/Dam 10. Tankers-truck/vendor 11. Sachet water **>> 9.15** 12. Bottled water **>>9.15** 13. Other (specify)
9.12.	What is the main source of drinking water for your household?			
9.13.	Do you use a process to prepare the water used for drinking?		1. Yes 2. No **>> 9.15**	
9.14.	What is the process through which you prepare the water used for drinking? (If more than one option is applicable, chose the most effective option)		1. Filtered 2. Boiled 3. Filtered and boiled	4. Iodine or other mineral/ natural treatments 5. UV treated 6. Other
9.15.	Does this dwelling have access to electricity?		1. Yes 2. No	
9.16.	What is the main lighting source for your household?		1. Electricity via national grid 2. Solar panel 3. Piped or liquid propane gas (biogas) 4. Private generator	5. Public or shared generator 6. Lanterns/candles/paraffin 7. Fire lit sticks, grass or pit 8. Other

9.17.	What is the main source of cooking fuel for your household?		1. Electricity 2. Piped or liquid propane gas (biogas) 3. Kerosene 4. Charcoal	5. Firewood 6. Animal dung 7. Agricultural crop residue 8. Other
No	**Question**	**Response**	**Response Codes**	
9.18	Do you cook in an external kitchen or internal kitchen?		1. External 2. Internal	
9.19.	What is the main destination of household waste for this household?		1. Collected by local authority 2. Collected by private firm 3. Own garbage pit or heap 4. Own burned or buried 5. Public garbage	6. Dumped in vacant land/property 7. Dumped in river, lake or sea 8. Other

Visit I - Module 10: Women's Empowerment in Agriculture Index (FtF Module H)

Enumerator Note: This questionnaire should be administered separately to the primary and secondary respondents. Complete the consent form if consent has not been taken earlier in Module 1 above. Ask to conduct the interview for this module in private or where other members of the household cannot overhear or contribute answers. Do not attempt to make responses between the primary and secondary respondent the same—it is ok for them to be different. Ensure that you code the outcome of the interview at the end of interview for each target respondent under this module.

Visit I - Module 10.1: Household Identification

Household Identification	Response/Code	Household Identification	Response/Code
10.1.01. Household Identification:		**10.04.** Type of household (If possible, auto fill this field after name has been selected from 11.1.02) Male and female adult .....1 Female adult only.....2	
10.1.02. Name of respondent currently being interviewed (Select from drop down list): **Surname, First name:**		**10.1.05.** Ability to be interviewed alone:	
10.1.03. Sex of respondent (Auto fill as soon as name is selected from 11.1.02)**:** Male .....1 Female 2		**Codes for 10.1.05** Alone .....1 With adult females present.....2 With adult males present.....3 With adults mixed sex present..... .....4 With children present .....5 With adults mixed sex and children present.....6	

Visit I - Module 10.2: Role in Household Decision-making around production and income generation (FtF Module H2).

Activity		Did you (singular) participate in [ACTIVITY] in the past 12 months (that is during the last [one/two] cropping seasons)? Yes.....1 No.....2 >> next activity	How much input did you have in making decisions about [ACTIVITY]?	How much input did you have in decisions on the use of income generated from [ACTIVITY]
Activity Code	Activity Description	**10.2.01**	**10.2.02**	**10.2.03**
A	Food crop farming: crops that are grown primarily for household food consumption			
B	Cash crop farming: crops that are grown primary for sale in the market			
C	Livestock raising			
D	Non-farm economic activities: Small business, self-employment, buy-and-sell			
E	Wage and salary employment: in-kind or monetary work both agriculture and other wage work			
F	Fishing or fishpond culture			
		Codes for 10.2.02 and 10.2.03: Input into decision making No input.....1 Input into very few decisions.....2 Input into some decisions.....3 Input into most decisions.....4 Input into all decisions.....5 No decision made.....6		

Visit I - Module 10.3: Access to Productive Capital (FtF Module H3)

	Productive Capital	Does anyone in your household currently have any [ITEM]? Yes .....1 No.....2 >> next item	How many of [ITEM] does your household currently have?	Who would you say owns most of the [ITEM]?	Who would you say can decide whether to sell [ITEM] most of the time?	Who would you say can decide whether to give away [ITEM] most of the time?	Who would you say can decide to mortgage or rent out [ITEM] most of the time?	Who contributes most to decisions regarding a new purchase of [ITEM]?
	Productive Capital	**10.3.01a**	**10.3.01b**	**10.3.02**	**10.3.03**	**10.3.04**	**10.3.05**	**10.3.06**
A	Agricultural land (pieces/plots)							
B	Large livestock (oxen, cattle)							
C	Small livestock (goats, pigs, sheep)							
D	Chickens, Ducks, Turkeys, Pigeons							
E	Fish pond or fishing equipment							
F	Farm equipment (non-mechanized)							
G	Farm equipment (mechanized)							
H	Nonfarm business equipment							
I	House (and other structures)							
J	Large consumer durables (fridge, TV, sofa)							
K	Small consumer durables (radio, cookware)							
L	Cell phone							
M	Other land not used for agricultural purposes (pieces, residential or commercial land)							
N	Means of transportation (bicycle, motorcycle, car)							

Codes for 10.3.02 to 10.3.06: Decision-making and control over productive capital

Self 1	Self and other household member(s).....5	Self and other outside people.....8
Partner/Spouse.....2	Partner/Spouse and other household member(s).....6	Partner/Spouse and other outside people.....9
Self and partner/spouse jointly 3	Someone (or group of people) outside the household...7	Self, partner/spouse and other outside people.....10
Other household member 4		

Visit I - Module 10.3 Continued: Access to Credit (FtF Module H3)

	Lending sources	Has anyone in your household taken any loans or borrowed cash/in-kind from [SOURCE] in the last 12 months?	Who made the decision to borrow from [SOURCE]?	Who makes the decision about what to do with the money/ item borrowed from [SOURCE]?	If more credit had been available from this source, would you have used it? 1 = Yes >> Next lending source 2 = No	Why would you not have borrowed more from [SOURCE]? Select code then >> Next source	Did you want to borrow or get a loan from [SOURCE] in the last 12 months but did not? 1 = Yes 2 = No >> Next source	Why were you not able to borrow from [SOURCE]? (Main reason only)
Lending source names		**10.3.07**	**10.3.08**	**10.3.09**	**10.3.10A**	**10.3.10B**	**10.3.11A**	**10.3.11B**
A	Non-governmental organization (NGO)							
B	Informal lender							
C	Formal lender (bank/financial institution)							
D	Friends or relatives							
E	Group based micro-finance or lending including Village Savings and Loans Associations (VSLAs)/susu etc.							

Codes for 10.3.07 Taken loans

Yes, cash..... 1
Yes, in-kind..... 2
Yes, cash and in-kind..... 3
No ..... 4 >> 10.3.11a
Don't know.....5 >> 10.3.11a

Codes for 10.3.08 & 10.3.09:

Self.....1
Partner/Spouse 2
Self and partner/spouse jointly.....3
Other household member.....4
Self and other household member(s).....5
Partner/Spouse and other household member(s).....6
Someone (or group of people) outside the household.....7
Self and other outside people.....8
Partner/Spouse and other outside people.....9
Self, partner/spouse and other outside people.....10

Codes for 10.3.10B/10.311B: Borrowing

Have enough money.....1
Afraid of losing collateral.....2
Do not have enough collateral/did not qualify for the loan.....3
Afraid cannot pay back the money.....4
Interest rate/other costs too high.....5
Not allowed to borrow/family dispute in borrowing decision.....6
Place of lender is too far.....7
Short time frame for repayment.....8
Other, specify.....9

Visit I - Module 10.4: Individual leadership and influence in the community (FtF Module H4)

Q.No.	Question	Response	Response options/Instructions
10.4.01	Do you feel comfortable speaking up in public to help decide on infrastructure (like small wells, roads, water supplies) to be built in your community?		No, not at all comfortable .....1 Yes, but with a great deal of difficulty...2 Yes, but with a little difficulty.....3 Yes, fairly comfortable .....4 Yes, very comfortable.....5
10.4.02	Do you feel comfortable speaking up in public to ensure proper payment of wages for public works or other similar programs?		
10.4.03	Do you feel comfortable speaking up in public to protest the misbehavior of authorities or elected officials?		

Visit I - Module 10.4 continued: Group membership and influence in the group (FtF Module H4)

	Group membership	Is there a [GROUP] in your community? 1 = Yes 2 = No >> next group 3 = DK >> next group	Are you an active member of this [GROUP]? 1 = Yes 2 = No >> **10.4.07**	How much input do you have in making decisions in this [GROUP]? (>> next group)	Why are you not a member of this [GROUP]?
	Group Categories	**10.4.04**	**10.4.05**	**10.4.06**	**10.4.07**
A	Agricultural / livestock/ fisheries producer's group (including marketing groups)				
B	Water users' group				
C	Forest users' group				
D	Credit or microfinance group (including Susu/ Village Savings and Loans Associations (VSLAs)				
E	Mutual help or insurance group (including burial societies)				
F	Trade and business association				
G	Civic groups (improving community) or charitable group (helping others)				
H	Local government				
I	Religious group				
J	Other women's group (only if it does not fit into one of the other categories)				
K	Other (specify)				
10.4.06: Input into decisions				**10.4.07: Why not member of group**	

No input .....1 Input into very few decisions .....2 Input into some decisions .....3 Input into most decisions.....4 Input into all decisions.....5	Not interested.....1 No time .....2 Unable to raise entrance fees..... ...3 Unable to raise reoccurring fees... ...4 Group meeting location not convenient. 5 Family dispute/unable to join..... ...6 Not allowed because of sex ....7 Not allowed because of other reason ...8 Other, specify.....9

Visit I - Module 10.5: Decision Making (FtF Module H5)

ENUMERATOR: Ask 10.5.01 for all categories of activities before asking 10.5.02. Do not ask 10.5.02 if 10.5.01 response is 1 and respondent is male OR 10.5.01 response is 2 and respondent is female. If household does not engage in that particular activity, enter 98 and proceed to next activity.		When decisions are made regarding the following aspects of household life, who is it that normally takes the decision?	To what extent do you feel you can make your own personal decisions regarding these aspects of household life if you want(ed) to? **Enumerator**: Ask only if 10.5.01 is 1 and respondent is female, 10.5.01 is 2 and respondent is male, or 10.5.01 is 3-7.
		10.5.01	**10.5.02**
A	Agricultural production?		
B	What inputs to buy for agricultural production?		
C	What types of crops to grow for agricultural production?		
D	When or who would take crop produce to the market?		
E	Livestock raising?		
F	Non-farm business activity?		
G	Your own (singular) wage or salary employment?		
H	Major household expenditures? (such as a large appliance for the house like refrigerator)		
I	Minor household expenditures? (such as food for daily consumption or other household needs)		
Codes for 10.5.01: Who makes decision Main male or husband.....1 Main female or wife .....2 Husband and wife jointly.....3 Someone else in the household.....4 Jointly with someone else inside the household .....5 Jointly with someone else outside the household .....6 Someone outside the household/other .....7 Household does not engage in activity/Decision not made98			**Codes for 10.5.02: Extent of participation in decision making** Not at all .....1 Small extent.....2 Medium extent.....3 To a high extent.....4

Visit I - Module 10.5 continued: Motivation for Decision Making (FtF Module H5)

ENUMERATOR: This set of questions is very important. I am going to give you some reasons why you act as you do in the aspects of household life I just mentioned. You might have several reasons for doing what you do and there is no right or wrong answer. Please tell me how true it would be to say: If household does not engage in that particular activity, enter 98 and proceed to next activity.		My actions in [ASPECT] are determined by the situation. I don't really have an option. [READ OPTIONS]	My actions in [ASPECT] are partly because I will get in trouble with someone if I act differently. [READ OPTIONS]	Regarding [ASPECT] I do what I do so others don't think poorly of me. [READ OPTIONS]	Regarding [ASPECT] I do what I do because I personally think it is the right thing to do. . [READ OPTIONS]
		10.5.03	**10.5.04**	**10.5.05**	**10.5.06**
A	Agricultural production				
B	Getting inputs for agricultural production				
C	The types of crops to grow for agricultural production				
D	Taking crop produce to the market (or not)				
E	Livestock raising				
F	Nonfarm business activity				
G	Your own (singular) wage or salary employment				
H	Major household expenditures (such as a large appliance for the house like refrigerator)				
I	Minor household expenditures (such as food for daily consumption or other household needs)				
		Codes for 10.5.03/10.5.04/10.5.05/10.5.06: Motivation for activity Never true.....1 Not very true.....2 Somewhat true.....3 Always true.....4 Household does not engage in activity /Decision not made.....98			

Visit I - Module 10.6: Time Allocation (FTF Module H6)

Enumerator: Please record a log of the activities for the individual in the last complete 24 hours (starting yesterday morning at 4 am, finishing 3 am of the current day). One to two activities can be marked for each time period by selecting the corresponding time period from the drop down menu. If two activities are marked, select from the activity status drop down list which of the two activities is primary and or secondary. Please administer using the protocol in the enumeration manual. In the paper based version, enumerators should provide the activity code and indicate the start time and end time before indicating whether it was a primary or a secondary activity.

NO	Activity Code (Use codes on next page)	Start Time	End Time	Status of Activity 1 - Primary 2 - Secondary
01				
02				
03				
04				
05				
06				
07				
08				
09				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				

Activity codes

Sleeping and resting -01	Shoping/getting service (including health services) -08	Exercising - 15
Eating and drinking -02	Weaving, sewing, textile care - 09	Social activities and hobbies - 16
Personal Care -03	Cooking - 10	Religious activities - 17
School (also homework) -04	Domestic Work (including fetching wood and water) - 11	Other (specify) _____
Work as employed -05	Care for children/adults/elderly - 12	
Own business - 06	Traveling and commuting - 13	
Farming/livestock/fishing -07	Watching TV/Listening to radio/reading - 14	

Visit I - Module 10.6 Continued: Satisfaction with Time Allocation (FtF Module H6)

Q. No.	Question	Response	Response options/Instructions
10.6.02	How satisfied are you with your available time for leisure activities like visiting neighbors, watching TV, listening to the radio, seeing movies or doing sports?		**READ:** Please give your opinion on a scale of 1 to 10. 1 means you are not satisfied and 10 means you are very satisfied. If you are neither satisfied nor dissatisfied this would be in the middle or 5 on the scale.

Enumerator: Complete this table after you have finished interviewing the individual for Module 10. Go back to Module 10.1 if this individual is the first (primary or secondary) respondent to Module 10.	**Response**	**Codes**
10.1.06. Outcome of interview (module 10 for respondent)		Completed ..... 1 Incomplete..... 2 Absent..... 3 Refused..... 4 Could not locate.....5

Visit II - Module 11: Household Consumption Expenditure (FTF Module G.)

Enumerator: Ask these questions about all household members. Ask the primary or secondary respondent, whoever is most knowledgeable about the food the household members have eaten in the last week, as well as any non-food items that household members have bought. As much as possible, look for the household member who has adequate information on household food consumption and purchases over the past week. The same respondent(s) should be asked questions in **11.1-11.6.**

Visit II - Module 11.1: Food Consumption Over Past 7 Days (FTF Module G1.)

Over the past one week (7 days), did you or others in your household eat any of the following food items? INCLUDE FOOD BOTH EATEN COMMUNALLY IN THE HOUSEHOLD AND THAT EATEN SEPARATELY BY INDIVIDUAL HOUSEHOLD MEMBERS, BOTH INSIDE AND OUTSIDE THE HOME	Yes=1, No=2 >>Next item	Item Code	How much in total did your household eat in the past week?		How much came from purchases? (in same unit as 11.1.03b)	How much did you spend on what was eaten last week? (if family ate part but not all of something they purchased, estimate only cost of what was consumed)	How much came from own-production? (in same unit as 11.1.03b)	How much came from gifts and other sources? (in same unit as 11.1.03b)
	11.1.01	**11.1.02**	**11.1.03a Quantity**	**11.1.03b Unit**	**11.1.04 Quantity**	**11.1.05 GHS**	**11.1.06 Quantity**	**11.1.07 Quantity**
Cereals, Grains and Cereal Products		1-15						
Maize normal flour		01						
Maize dough		02						
Green maize (fresh maize cob)		03						
Rice (paddy, grain)		04						
Sorghum/Guinea corn		05						
Millet grain		06						
Millet flour		07						
Other grains		08						
Other flours		09						
Bread		10						
Biscuits		11						
Spaghetti, macaroni, pasta		12						
Breakfast cereal		13						

Over the past one week (7 days), did you or others in your household eat any of the following food items? INCLUDE FOOD BOTH EATEN COMMUNALLY IN THE HOUSEHOLD AND THAT EATEN SEPARATELY BY INDIVIDUAL HOUSEHOLD MEMBERS, BOTH INSIDE AND OUTSIDE THE HOME	Yes=1, No=2 >>Next item	Item Code	How much in total did your household eat in the past week?		How much came from purchases? (in same unit as 11.1.03b)	How much did you spend on what was eaten last week? (if family ate part but not all of something they purchased, estimate only cost of what was consumed)	How much came from own-production? (in same unit as 11.1.03b)	How much came from gifts and other sources? (in same unit as 11.1.03b)
	11.1.01	**11.1.02**	**11.1.03a Quantity**	**11.1.03b Unit**	**11.1.04 Quantity**	**11.1.05 GHS**	**11.1.06 Quantity**	**11.1.07 Quantity**
Infant feeding cereals		14						
Other (specify)		15						
Roots, Tubers, and Plantains		16-29						
Cassava tubers		21						
Cassava-gari		22						
Cassava flour		23						
Cassava (other forms)		24						
Yam		25						
Cocoyam		26						
Plantain		27						
Potatoes (Sweet & other potato)		28						
Other (specify)		29						
Nuts and Pulses		30-38						
Bambara beans		30						
Cowpea		31						
Pigeon pea		32						
Groundnut (roasted or raw)		33						
Soyabeans		34						
Other legumes/pulses		35						

Over the past one week (7 days), did you or others in your household eat any of the following food items? INCLUDE FOOD BOTH EATEN COMMUNALLY IN THE HOUSEHOLD AND THAT EATEN SEPARATELY BY INDIVIDUAL HOUSEHOLD MEMBERS, BOTH INSIDE AND OUTSIDE THE HOME	Yes=1, No=2 >>Next item	Item Code	How much in total did your household eat in the past week?		How much came from purchases? (in same unit as 11.1.03b)	How much did you spend on what was eaten last week? (if family ate part but not all of something they purchased, estimate only cost of what was consumed)	How much came from own-production? (in same unit as 11.1.03b)	How much came from gifts and other sources? (in same unit as 11.1.03b)
	11.1.01	**11.1.02**	**11.1.03a Quantity**	**11.1.03b Unit**	**11.1.04 Quantity**	**11.1.05 GHS**	**11.1.06 Quantity**	**11.1.07 Quantity**
Palm nuts		36						
Coconut		37						
Other Nuts		38						
Vegetables		39-52						
Onions		39						
Tomatoes		40						
Carrots		41						
Cabbage/Lettuce		42						
Okro		43						
Garden eggs/egg plant		44						
Pepper		45						
Nkontonmire		46						
Cucumber		47						
Pumpkin		48						
Mushroom		49						
Other cultivated green leafy vegetables		50						
Gathered wild green leaves		51						
Other vegetables (specify): _____		52						

Over the past one week (7 days), did you or others in your household eat any of the following food items? INCLUDE FOOD BOTH EATEN COMMUNALLY IN THE HOUSEHOLD AND THAT EATEN SEPARATELY BY INDIVIDUAL HOUSEHOLD MEMBERS, BOTH INSIDE AND OUTSIDE THE HOME	Yes=1, No=2 >>Next item	Item Code	How much in total did your household eat in the past week?		How much came from purchases? (in same unit as 11.1.03b)	How much did you spend on what was eaten last week? (if family ate part but not all of something they purchased, estimate only cost of what was consumed)	How much came from own-production? (in same unit as 11.1.03b)	How much came from gifts and other sources? (in same unit as 11.1.03b)
	11.1.01	**11.1.02**	**11.1.03a Quantity**	**11.1.03b Unit**	**11.1.04 Quantity**	**11.1.05 GHS**	**11.1.06 Quantity**	**11.1.07 Quantity**
Meat, Fish and Animal Products		53-68						
Eggs		53						
Fresh Fish and Shellfish		54						
Dried Fish		55						
Smoked Fish		56						
Beef		57						
Goat		58						
Pork		59						
Mutton		60						
Chicken		61						
Other poultry - guinea fowl, doves		62						
Small animal- rabbit, squirrels, etc		63						
Wild game		64						
Game birds		65						
Snail		66						
Tinned meat or fish		67						
Other (specify)		68						
Fruits		69-79						
Mangoes		69						
Bananas		70						

Over the past one week (7 days), did you or others in your household eat any of the following food items? INCLUDE FOOD BOTH EATEN COMMUNALLY IN THE HOUSEHOLD AND THAT EATEN SEPARATELY BY INDIVIDUAL HOUSEHOLD MEMBERS, BOTH INSIDE AND OUTSIDE THE HOME	Yes=1, No=2 >>Next item	Item Code	How much in total did your household eat in the past week?		How much came from purchases? (in same unit as 11.1.03b)	How much did you spend on what was eaten last week? (if family ate part but not all of something they purchased, estimate only cost of what was consumed)	How much came from own-production? (in same unit as 11.1.03b)	How much came from gifts and other sources? (in same unit as 11.1.03b)
	11.1.01	**11.1.02**	**11.1.03a Quantity**	**11.1.03b Unit**	**11.1.04 Quantity**	**11.1.05 GHS**	**11.1.06 Quantity**	**11.1.07 Quantity**
Citrus (oranges, tangerine, etc.		71						
Pineapple		72						
Pawpaw		73						
Guava		74						
Avocado Pears		75						
Water Melon		76						
Apple		77						
Wild fruit (shea, dawadawa, etc.)		78						
Other fruits (specify)		79						
Milk and Milk Products		80-86						
Fresh milk		80						
Other milk (Powdered, sourced etc)		81						
Margarine /Butter		82						
Yoghurt		83						
Cheese		84						
Infant feeding formula (for bottle)		85						
Other (specify)		86						
Sugar, Fats, and Oil		87-94						
Sugar		87						

Over the past one week (7 days), did you or others in your household eat any of the following food items? INCLUDE FOOD BOTH EATEN COMMUNALLY IN THE HOUSEHOLD AND THAT EATEN SEPARATELY BY INDIVIDUAL HOUSEHOLD MEMBERS, BOTH INSIDE AND OUTSIDE THE HOME	Yes=1, No=2 >>Next item	Item Code	How much in total did your household eat in the past week?		How much came from purchases? (in same unit as 11.1.03b)	How much did you spend on what was eaten last week? (if family ate part but not all of something they purchased, estimate only cost of what was consumed)	How much came from own-production? (in same unit as 11.1.03b)	How much came from gifts and other sources? (in same unit as 11.1.03b)
	11.1.01	**11.1.02**	**11.1.03a Quantity**	**11.1.03b Unit**	**11.1.04 Quantity**	**11.1.05 GHS**	**11.1.06 Quantity**	**11.1.07 Quantity**
Sugar Cane		88						
Palm oil		89						
Palm kernel oil		90						
Coconut oil		91						
Groundnut oil		92						
Shea butter		93						
Other cooking oils		94						
Beverages		95-103						
Tea		95						
Coffee		96						
Cocoa, Milo, chocolim etc		97						
Fruit juice		98						
Freezes (flavoured ice)		99						
Non-Alcoholic beverages		100						
Alcoholic beverages		101						
Bottled water		102						
Other (specify)		103						
Spices & Miscellaneous		104-110						

Over the past one week (7 days), did you or others in your household eat any of the following food items? INCLUDE FOOD BOTH EATEN COMMUNALLY IN THE HOUSEHOLD AND THAT EATEN SEPARATELY BY INDIVIDUAL HOUSEHOLD MEMBERS, BOTH INSIDE AND OUTSIDE THE HOME	Yes=1, No=2 >>Next item	Item Code	How much in total did your household eat in the past week?		How much came from purchases? (in same unit as 11.1.03b)	How much did you spend on what was eaten last week? (if family ate part but not all of something they purchased, estimate only cost of what was consumed)	How much came from own-production? (in same unit as 11.1.03b)	How much came from gifts and other sources? (in same unit as 11.1.03b)
	11.1.01	**11.1.02**	**11.1.03a Quantity**	**11.1.03b Unit**	**11.1.04 Quantity**	**11.1.05 GHS**	**11.1.06 Quantity**	**11.1.07 Quantity**
Salt		104						
Spices		105						
Sauces (tomato, soy, Neri etc)		106						
Honey		107						
Jam, jelly		108						
Sweets, candy, chocolates		109						
Other (specify)		110						
Cooked Foods from Vendors		111-124						
Maize - boiled or roasted (vendor)		111						
Chips (vendor)		112						
Cassava fufu		113						
Yam fufu		114						
Yam - boiled (Ampesi)		115						
Plantain - boiled/fried/roasted		116						
Rice based vendor foods		117						
Eggs - boiled (vendor)		118						
Chicken (vendor)		119						
Meat (vendor)		120						
Fish (vendor)		121						

Over the past one week (7 days), did you or others in your household eat any of the following food items? INCLUDE FOOD BOTH EATEN COMMUNALLY IN THE HOUSEHOLD AND THAT EATEN SEPARATELY BY INDIVIDUAL HOUSEHOLD MEMBERS, BOTH INSIDE AND OUTSIDE THE HOME	Yes=1, No=2 >>Next item	Item Code	How much in total did your household eat in the past week?		How much came from purchases? (in same unit as 11.1.03b)	How much did you spend on what was eaten last week? (if family ate part but not all of something they purchased, estimate only cost of what was consumed)	How much came from own-production? (in same unit as 11.1.03b)	How much came from gifts and other sources? (in same unit as 11.1.03b)
	11.1.01	**11.1.02**	**11.1.03a Quantity**	**11.1.03b Unit**	**11.1.04 Quantity**	**11.1.05 GHS**	**11.1.06 Quantity**	**11.1.07 Quantity**
Doughnut (vendor)		122						
Meal eaten at restaurant/chop bar		123						
Other (specify)		124						

UNITS	**UNITS - continued**	**UNITS - continued**	**UNITS - continued**
American tin - 01 Balls - 02 Bar - 03 Barrel - 04 Basket - 05 Beer bottle -06 Bowl -07 Box - 08 Bucket - 09 Bunch - 10 Bundle - 11	Crate - 12 Calabash - 13 Dozen - 14 Fanta /coke bottle - 15 Fingers - 16 Fruits - 17 Gallon - 18 Kilogram -19 Litre - 20 Loaf - 21	Log - 22 Margarine tin -23 Maxi bag -24 Mini bag -25 Meters -26 Nut - 27 Pair - 28 Pieces - 29 Pots - 30 Pounds - 31 Set - 32	Sheet - 33 Singles - 34 Stick - 35 Tonne - 36 Tree - 37 Tubers - 38 Yards - 39

Visit II - Module 11.2: Non-food Expenditures - Over Past One Week and One Month (FTF Module G2.)

ONE WEEK RECALL	Item code	Yes=1 No=2>>Next Item	How much did you pay (how much did they cost) in total?
	11.2.01	**11.2.02**	**11.2.03 GHS**
Over the past one week (7 days), did your household use or buy any of the under listed items?	125-133		
Charcoal/Firewood	125		
kerosene	126		
Cigarettes or other tobacco	127		
Candles	128		
Matches	129		
Newspapers or magazines	130		
Public transport - Taxi/ trotro etc	131		
Public transport - Bus/Minibus	132		
Others Public transport (Specify)	133		
ONE MONTH RECALL			
Over the past one month, did your household use or buy any [...]?	134-154		
Milling fees for grains (not including cost of grain itself), grain	134		
Bar soap (body soap or clothes soap)	135		
Clothes soap (powder, paste)	136		
Bathing soap (Tablets, liquid etc)	137		
Toothpaste, toothbrush	138		
Toilet paper	139		
Glycerin, Vaseline, skin creams	140		

ONE MONTH RECALL CONTINUED	Item code	Yes=1 No=2>>Next Item	How much did you pay (how much did they cost) in total?
	11.2.01	**11.2.02**	**11.2.03 GHS**
Other personal products (shampoo, razor blades, cosmetics, hair products, etc.)	141		
Light bulbs	142		
Postal fees (stamps and other postal fees)	143		
Donation - to church, charity, beggar, etc.	144		
Vehicle Fuel (Petrol or diesel)	145		
Motor vehicle (including bicycle) service, repair, or parts	146		
Wages paid to servants	147		
Mortgage - regular payment to purchase house	148		
Rent	149		
Repairs & maintenance to dwelling	150		
Repairs to household and personal items (radios, watches, etc., excluding battery purchases)	151		
Expenditures on pets	152		
Batteries	153		
Cell/Mobile phones/Phone credit	154		
HEALTH EXPENDITURES (Include Estimated Value of any In-Kind Payments, or borrowed amounts)	155-158		
Anything related to illnesses and injuries, including for medicine, tests, consultation, & in-patient fees	155		
Medical care not related to an illness - preventative health care, pre-natal visits, check-ups, etc.	156		
Non-prescription medicines - Panadol, malaria drug, cough syrup, etc.	157		
Others…	158		

Visit II - Module 11.3: Non-Food Expenditures Over Past Three Months (FTF MODULE G3).

Over the past three months, did your household use or buy any of the under listed items?	Item code	Yes=1 No=2>>Next Item	How much did you pay (how much did they cost) in total?
	11.3.01	**11.3.02**	**11.3.03 GHS**
THREE MONTHS	159-194		
Infant clothing	159		
Baby nappies/diapers	160		
Boy's trousers (FOR ALL CLOTHING, EXCLUDE UNIFORMS/SCHOOL CLOTHING)	161		
Boy's shirts	162		
Boy's jackets	163		
Boy's under wears	164		
Boy's other clothing	165		
Men's trousers	166		
Men's shirts	167		
Men's jackets	168		
Men's underwaer	169		
Men's other clothing	170		
Girl's blouse/shirt	171		
Girl's dress/skirt	172		
Girl's underwear	173		
Girl's other clothing	174		

Over the past three months, did your household use or buy any of the under listed items?	Item code	Yes=1 No=2>>Next Item	How much did you pay (how much did they cost) in total?
	11.3.01	**11.3.02**	**11.3.03 GHS**
Lady's blouse/shirt	175		
Lady's dress/skirt	176		
Lady's underwear	177		
Lady's other clothing	178		
Boy's shoes	179		
Men's shoes	180		
Girl's shoes	181		
Lady's shoes	182		
Cloth, thread, other sewing material	183		
Laundry, dry cleaning, tailoring fees	184		
Bowls, glassware, plates, silverware, etc.	185		
Cooking utensils (cook pots, stirring spoons and whisks, etc.)	186		
Cleaning utensils (brooms, brushes, etc.)	187		
Torch / flashlight	188		
Umbrella	189		
Kerosene lamp/lantern	190		
Stationery items (excluding school related)	191		
Books (excluding school related)	192		
Music or video cassette or CD/DVD	193		
Other	194		

Visit II - Module 11.4: Non-Food Expenditures over Past 12 Months (FTF Module G4)

Over the past one year (twelve months), did your household use or buy any of the under listed items?	Item code	Yes=1 No=2>>Next Item	How much did you pay (how much did they cost) in total?
	11.4.01	**11.4.02**	**11.4.03 GHS**
PAST ONE YEAR (12 MONTHS)	195-210		
Carpet, rugs, drapes, curtains	195		
Mat - sleeping or for drying maize flour	196		
Mosquito net	197		
Mattress	198		
Sports & hobby equipment, musical, instruments, toys	199		
Cement	200		
Bricks	201		
Construction timber	202		
Council rates	203		
Insurance – health, auto, home, life	204		
Fines or legal fees	205		
Marriage (bride wealth) costs	206		
Outdooring/ Naming ceremody	207		
Marriage ceremony costs	208		
Funeral costs, household members	209		
Funeral costs, non household members (relatives, neighbors/friends)	210		

Over the past one year (twelve months), did your household use or buy any of the under listed items?	Item code	Yes=1 No=2>>Next Item	How much did you pay (how much did they cost) in total?
	11.4.01	**11.4.02**	**11.4.03 GHS**
HEALTH EXPENDITURES (Include Estimated Value of any In-Kind Payments, or borrowed amounts)over last 12 months	211-214		
Hospitalizations or overnight stay in any hospital – total cost for treatment, including food cost	211		
Travel to and from the medical facility for any overnight stay(s) or hospitalization	212		
Over-night(s) stay at a traditional healer's or faith healer's dwelling – total costs for treatment, including food cost	213		
Travel costs to the traditional healer's or faith healer's dwelling for overnight stay(s)	214		
EDUCATION EXPENDITURES (Include Estimated Value of any In-Kind Payments, or borrowed amounts) over last 12 months	215-223		
Tuition, including extra tuition fees	215		
Expenditures on after school programs and tutoring	216		
School books and stationary	217		
School uniform	218		
Boarding fees	219		
Contribution to school building maintenance	220		
Transport to and from school	221		
Parent/Teacher Association and other related fees	222		
Other	223		

NON-FOOD ITEMS THAT MAY NOT HAVE BEEN PURCHASED	Item Code	Yes=1 No=2>>Next Item	What was the estimated total value of [ITEM] used?		What was the total estimated value of [ITEM] that you used (for items that were gathered)? GHS	How much did you spend total on [ITEM] (for items that were bought) GHS
	11.4.01	**11.4.02**	**11.4.03a Quantity**		**11.4.03b Unit**	**11.4.04 GHS**
Over the past one year (12 months) did your household gather, use or buy any of the under listed items? (note that the value of these items should be entered only if they were purchased or used for the house, not any investments)	224-226		Quantity	Unit		
Wood poles, bamboo	224					
Grass for thatching roof or other use	225					
other	226					

Visit II - Module 11.5: Housing Expenditures (FTF Module G5)

Do you own or are purchasing this house, is it provided to you by an employer, do you use it for free, or do you rent this house?	If you sold this dwelling today, how much would you receive for it?	How many years ago was this house built? How old is it?	If you rented this dwelling today, how much rent would you receive?		How much do you pay to rent this dwelling?	
11.5.01	**11.5.02** GHS	**11.5.03 YEARS**	**11.5.04a** GHS	**11.5.04b Unit**	**11.5.05a** GHS	**11.5.05b Unit**

Phase II Module11.5 Household Expenditures Codes

11.5.01	**11.5.02/03**	**11.5.04/11.5.05**
OWN. . ……. . 1>>11.5.02 BEINGPURCHASED …… 2 >>11.5.02 EMPLOYER PROVIDES. . ..3**>>11.5.04** FREE, AUTHORIZED …..4**>>11.5.04** FREE, NOT AUTHORIZED. ….5**>>11.5.04** RENTED. . . ..6**>>11.5.05** Don't know/non-response/NA……..98.	Don't know/non-response/NA……..98.	DAY….1 WEEK…2 MONTH…3 YEAR…4 Don't know/non-response/NA….98

Visit II - Module 11.6: Durable Goods Expenditures (FTF Module G6)

	YES=1 NO=2>>Next Item	ITEM CODE	How many [ITEM]s do you own?	What is the age of these [ITEM]s? IF MORE THAN ONE ITEM, AVERAGE AGE.	If you wanted to sell one of these [ITEM]s today, how much would you receive? IF MORE THAN ONE, AVERAGE VAUE.	Did you purchase or pay for any of these [ITEM]s in the last 12 months? Yes=1 No=2>> Next item	How much did pay for all these [ITEM] all together (total) in the last 12 months?
	11.6.01	**11.6.02**	**11.6.03 Number**	**11.6.04 Year(s)**	**11.6.05** GHS	**11.6.06**	**11.6.07** GHS
Does your household own a [ITEM]?		227-259					
Bed		227					
Table		228					
Chair		229					
Fan		230					
Air conditioner		231					
Radio		232					
Tape or CD/DVD player/VCR		233					
Television		234					
Sewing machine		235					
Kerosene stove		236					
Electric stove; hot plate		237					
Gas stove		238					

	YES=1 NO=2>>Next Item	ITEM CODE	How many [ITEM]s do you own?	What is the age of these [ITEM]s? IF MORE THAN ONE ITEM, AVERAGE AGE.	If you wanted to sell one of these [ITEM]s today, how much would you receive? IF MORE THAN ONE, AVERAGE VAUE.	Did you purchase or pay for any of these [ITEM]s in the last 12 months? Yes=1 No=2>> Next item	How much did pay for all these [ITEM] all together (total) in the last 12 months?
	11.6.01	**11.6.02**	**11.6.03** **Number**	**11.6.04** **Year**	**11.6.05** GHS	**11.6.06**	**11.6.07** GHS
Refrigerator		239					
Washing machine		240					
Bicycle		241					
Boat		242					
Moto bike		243					
Car		244					
Mini-bus		245					
Lorry/truck		246					
Donkey cart		247					
Bullock traction equipment		248					
Beer-brewing drum		249					
Upholstered chair, sofa set		250					
Coffee table (for sitting room)		251					
Cupboard, drawers, bureau		252					

	YES=1 NO=2>>Next Item	ITEM CODE	How many [ITEM]s do you own?	What is the age of these [ITEM]s? IF MORE THAN ONE ITEM, AVERAGE AGE.	If you wanted to sell one of these [ITEM]s today, how much would you receive? IF MORE THAN ONE, AVERAGE VAUE.	Did you purchase or pay for any of these [ITEM]s in the last 12 months? Yes=1 No=2>> Next item	How much did pay for all these [ITEM] all together (total) in the last 12 months?
	11.6.01	**11.6.02**	**11.6.03** **Number**	**11.6.04** **Year**	**11.6.05** GHS	**11.6.06**	**11.6.07** GHS
Desk		253					
Clock		254					
Iron (for pressing clothes)		255					
Computer equipment & accessories		256					
Satellite dish		257					
Solar panel		258					
Generator		259					