UNIVERSITY OF EDUCATION, WINNEBA

HYGIENIC PRACTICES OF CATERERS/COOKS OPERATING THE GHANAIAN SCHOOL FEEDING PROGRAMME IN SOME SELECTED SCHOOLS IN KOFORIDUA MUNICIPALITY IN THE EASTERN REGION OF GHANA

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DECLARATION

Candidate's Declaration

I, Patience Owusua Annoh hereby declare that this thesis with exception of references contained in published works which have been identified and acknowledge is entirely my own research work and that has neither in part nor whole been submitted for another degree elsewhere.

Signature: ……..

Date: ……..

Supervisor's Declaration

I hereby declare that the preparations of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Education, Winneba.

Madam Comfort Katumi Madah

Signature: ……

Date: ……

DEDICATION

This work is dedicated to my parents, Mr. J.N. Annoh, Madam Paulina Abena Ntiamoah and my children, Wendy Agyeibea Amo and Francis Appiah Amo.

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DEFINITION OF ACRONYMS

ADRA	Adventist Development and Relief Agency
AOP	Annual Operating Plan
AU	African Union
BAPPENAS	National Development Planning Agency
BBQ	Barbecue
CAADP	Comprehensive African Agriculture Development Programme
CDC	Centers Disease Control
CRS	Christian Relief Service
DA	District Assembly
DDO	District Desk Officer
DHD	District Health Director
DICs	District Implementation Committees
EHO	Environmental Health Officers
EPA	Environmental Protection Agency
FAO	Food and Agriculture Organization
FDA	Food and Drug Authority
FFE	Food for Education
GES	Ghana Education Service
GPHA	Ghana Public Health Act
GOB	Government of Bangladesh
GoG	Government of Ghana
GPRS	Ghana Poverty Reduction Strategy
GSA	Ghana Standards Authority
GPSER	Gross Primary School Enrolment Rates
GTB	Ghana Tourist Board
IDT	Inpres Desa Tertineggal
HACCP	Hazard Analysis Critical Control Point
HBM	Health Belief Model
HIPCs	Highly Indebted Poor Countries
HGSFP	Home Grown School Feeding Programme

HIV	Human Immunodeficiency Virus
IBDP	International Business Development Programme
LGRDE	Local Governance, Rural Development and Environment
MDGs	Millennium Development Goals
MMDAs	Metropolitan, Municipal District Assemblies
MLGRD	Ministry of Local Government and Rural Development
MoE	Ministry of Education
MOESS	Ministry of Education, Science and Sports
MOFA	Ministry of Food and Agriculture
MOH	Ministry of Health
NEPAD	New Partnership for African's Development
NSLP	National School Lunch Programme
NPSER	Net Primary School Enrolment Rates
PESP	Pesticide Environmental Stewardship Partnership
PTA	Parent Teacher Association
SEND	Social Enterprise Development Organization
SFP	School Feeding Programme
SIC	School Implementation Committee
SNV	Netherlands Development Cooperation
SCT	Social Cognitive Theory
TPB	Theory of Planned Behaviour
UN	United Nations
UNESCO	UNESCO
UNHTF	United Nations Hunger Task Force
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
VSD	Vertinary Service Department
WFP	World Food Programme
WHO	World Health Organization
WIAD	Women in Agriculture Development
WVI	World Vision International

ABSTRACT

The study aimed at identifying the hygienic practices among caterers/cooks operating the Ghanaian School Feeding Programme in Koforidua Municipality. It specifically sought to ascertain the personal, food and environmental hygiene status of the caterers in the school feeding programme and assess the nutritional adequacy of the meals prepared. Descriptive survey design was adopted and the population consisted of the beneficiary schools in New Juaben Municipality in Koforidua, Eastern Region of Ghana. Purposive sampling method was used to select 60 participants for the study. Interview and observation were the main instruments used for the study. The study found that, the meals provided have not achieved the aim of the GSFP because it was ascertained from the study that some of the caterers/cooks are poor in practicing hygiene and the meals provided are not nutritious as expected. The study recommended among other things that Caterers/ cooks should involve expert in designing the menus for them. Also, there should be efficient inspection of kitchens of caterers/cooks and how food is dispensed to people. For hygiene, the key actors in the SFP should give periodic education on the importance of applying best hygienic practices in the preparation and handling to the caterers/cooks and insist the right thing is done.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Nutritional and health status are powerful influences on a child's learning and on how well a child performs in school. Children who lack certain nutrients in their diet (particularly iron and iodine), or who suffer from protein-energy malnutrition, hunger, parasitic infections or other diseases, do not have the same potential for learning as healthy and well-nourished children. Weak health and poor nutrition among school-age children diminish their cognitive development either through physiological changes or by reducing their ability to participate in learning experiences or both (Musa & Akande, 2003).

Contrary to conventional wisdom, nutritional status does not improve with age. The extra demands on school-age children (for example, to perform chores or walk long distances to school) create a need for energy that is much greater than that of younger children. Indeed, available data indicate high levels of protein-energy malnutrition and short-term hunger among school-age children. Moreover, deficiencies of critical nutrients such as iodine, vitamin A and iron among the school-age children are pervasive (Partnership for Child Development, 1998). It is estimated that 60 million school-age children suffer from iodine deficiency disorders and that another 85 million are at risk for acute respiratory disease and other infections because they are deficient in vitamin A (UNESCO, 2007). The number suffering from iron deficiency anemia is greater still – 210 million (Jamison *et. al*, 1993).

While universal primary school attendance is a stated goal by many governments and the Millennium Development Goals (MDG), enrollment rates continue to be low in many developing countries (UNESCO, 2007). To foster enrolment, many governments have eliminated primary school fees, as well as established programmes such as school feeding food program (Levinger, 1986) or conditional cash transfers more recently (Schultz, 2004) to increase the demand for schooling.

The ambition of all nations in the United Nations (UN) to address the challenges resulting from advancing globalization resulted in the formulation of the Millennium Development Goals (MDGs) in the year 2000. In the formulation of the MDGs attention has been paid to hunger and poverty as stated in MDG number 1: Eradicate extreme hunger and poverty. The sub goal formulated hereby is: "by the year 2015 the proportion of people who suffer from hunger is halved as compared to 1990 (UN, 2005)". Sustainable Development Goal (SDG) is now designed to finish the job of MDG to get a statistical "zero" on hunger, poverty, preventable child death and others. School Feeding Programmes (SFP's) are said to contribute to achieving this first Millennium Development Goal.

The United Nations Hunger Task Force (UNHTF) has made seven recommendations on how to achieve the first MDG. These are stated in their- report "Halving Hunger, it can be done." One of the strategies identified by the UNHTF to achieve this goal is the implementation of school feeding programmes (SFPs) with locally produced foods rather than imported food (aid). The UNHTF considers school feeding programmes as a good combination of education and agriculture. Their point of view is that SFPs could increase school attendance, especially of girls and, furthermore, the

implementation can stimulate the market demand for locally produced foods. The UNHTF especially recommends comprehensive community- and school-based feeding programmes that include not only school feeding, but also systematic de-worming, micronutrient supplementation, take-home rations, safe cooking facilities, clean drinking water and improved sanitation.

Also, education on HIV/AIDS, health, nutrition and hygiene should be included. All these ingredients taken together provide a good platform for improving schools, keeping children healthy and engaging the community (UN, 2005). The New Partnership on Africa's Development (NEPAD) adopted the approach of the UNHTF and also focuses on the combination of feeding programmes and agriculture. The NEPAD is a part of the African Union (AU), and was founded in 2002. The NEPAD Secretariat has formulated the Comprehensive Africa Agricultural Development Programme (CAADP), which functions as a framework for the restoration of agriculture, growth, food security and rural development in Africa (Ahmed, 2004). In this framework, pillar 3 has a specific focus on increasing food supply and reducing hunger and includes the following objectives: (1) to reduce malnutrition in school going children through diet supplementation via a complete and adequate meal (in terms of calorie and micronutrient content), and (2) to expand local demand for food products and to stimulate production by smallholder farms. NEPAD has formulated an indicator of improvement: the provision of basic school lunches that are balanced in terms of caloric micronutrient content to 1,000,000 children in poor and vulnerable areas throughout the NEPAD member states.

1.2 Statement of the Problem

The GSFP is a strategic policy to increase domestic food production, household incomes and food security in deprived communities. In addition, the UNHTF especially recommends comprehensive community and school based feeding programme that includes not only school feeding, but also systematic de-worming, micronutrients supplementation, take-home rations, safe cooking facilities, clean drinking water and improved sanitation (UNHTF, 2004). WHO (1989) indicated that food handlers have very important role to ensure food safety throughout the chain of food production, processing, storage and preparation. Any disregard for safety including mishandling of food and abuse of hygienic measures on the part of food vendors may cause unpleasant consequences. It has been observed from the literature reviewed that while developed countries continue to monitor, evaluate and improve programme delivery through research, particularly on the hygienic and nutritional quality of school food service meals, such initiatives are lagging behind in developing countries of which Ghana is no exception. Fosket and Ceserani (2007) stated that poor hygienic practices can contribute to outbreaks of food borne illnesses, malnutrition and hunger. It is therefore important that food establishment management/owner provides methods and means of handling that prevent damage to or deterioration or contamination of any food product. There is lack of sensitization training aimed at certifying the caterers/cooks to ensure that food prepared for pupils is hygienic and nutritious for their healthy growth for the full benefit for the school feeding. Monitoring and advocating the hygienic practices of caterers/cooks of the programme to make it more effective is lagging behind because of the limited research in developing countries.

However, it has been observed that health and hygiene education still remains one of the challenges in the implementation of the Ghana school feeding programme to the

limited knowledge of some caterers/cooks on hygiene practices in Koforidua Municipality. Marth (1985), observed that food handlers are usually young, itinerant and inexperienced people who usually stay on the job for a year and hence it becomes extremely difficult to find and educate them whiles actively working. In relation to this Walker et. al., (2003) asserted that there is a high probability that the absence of continuous training and reinforcement is to be blamed for lack of food hygiene knowledge concerning a number of aspects in safe food production. A lot of studies have confirmed the rather low level of knowledge of food handlers on hygienic and microbial safety to ready-to-eat foods (Walker et al., & Tebutt, 1992). Inadequate hygienic knowledge and lack of understanding of the basic principles of food hygiene is therefore a major bottleneck to the implementation of good hygiene practices in the handling of ready-to-eat foods in our schools and other public places. In this connection, Ehiri and Morris (1994) were of the view that there is the need to conscientiously prevail upon and motivate food handlers to put to practice their knowledge in food hygiene. Health and hygiene education still remains one of the challenges in the implementation of Ghana school feeding programme to the limited knowledge of some caterers and cooks (Musa & Akande, 2003).

Most caterers/cooks in the SFP have limited information on basic health, hygiene and nutrition issues that enhance the quality of food they prepared under hygienic conditions in Koforidua Municipality. They lack the right ethics, hygiene, safety measures, among others that enhance the nature of the food served to the school children forgetting that the full benefit of the school feeding would not be derived if the pupils are feed on unhygienic and innutritious foods. Their access to information on health and hygiene as well as health facilities are generally be regarded as low therefore they base their cooking practices on misconceptions and taboos on health

issues which is very dangerous when it comes to catering for children who are already vulnerable to diseases. The observation then is to look at the hygienic practices, nutrition and other health benefits that are concerned in relation to poverty reduction and enhancement of food security. Although many countries as well as Ghana are carrying out school feeding programme, they are not being rigorously evaluated or assessed to find out if this feeding programme has translated into better results. The question then is: "Are the meals provided by the Ghanaian School Feeding Programme hygienic and nutritious enough to achieve its aim? It was to answer this and many more questions that this study sought to find out the hygienic practices of caterers/cooks operating in the Ghana Governments' school feeding programme in fifteen selected schools in Koforidua Municipality.

1.3 Purpose of the Study

The main purpose of the study was to ascertain the effectiveness of the Ghanaian School Feeding Program in Koforidua Municipality and propose measures which can be put in place to improve the service in terms of hygiene.

1.4 Research Objectives

The study specifically sought to:

1. examine the responsibilities of the caterers and cooks, head teachers and PTA chairpersons;
2. assess the level of awareness of caterers about the rules governing catering industry in Ghana;
3. ascertain the personal, food and environmental hygiene status of the caterers in the school feeding programme

4. assess the nutritional adequacy of the meals prepared.

1.5 Research Questions

In attempting to examine the effectiveness of the Ghanaian School Feeding Programme in Koforidua Municipality, the following research questions guided the researcher to ascertain the findings at the end of the study:

1. What are the responsibilities of the caterers and cooks, head teachers and PTA chairmen?
2. To what extent are caterers aware of rules governing catering industry?
3. What are the personal, food and environmental hygiene of the caterers in the school feeding program?
4. To what extent ere meals prepared nutritionally adequate?

1.6 Significance of the study

The basic output of this research may provide an empirical evidence for justifying the effectiveness of Ghana's School Feeding Programme and to expose it to best management and health practices. It may also provide relevant and reliable information which can serve as review and modification of existing policies. The research can also serve as policy research report on the conduct of some stakeholders whose actions and inactions are making it difficult to achieve the set objectives for the success and sustenance of the programme. It is expected that the Government and all the stakeholders shall determine to strengthen the management review and re-

organization of the framework in the implementation of the School Feeding Programme.

1.7 Delimitation of the Study

The study was confined to Asokore, Effiduase, Akwadum and Oyoko, Koforidua in the New Juaben Municipality in the Eastern Region of Ghana. These places were chosen for the study because they are the immediate suburbs of the Koforidua Township where many schools are beneficiaries of the school feeding programme with school dropouts also on the increase. The results therefore cannot be generalized. It was also delimited by the categories of respondents used for the study; some of which were caterers/cooks, pupils, Parents Teacher Association, teachers, desktop officials who were in-charge of the programme and beneficiaries and therefore the findings of the study cannot be applied in all schools at other places that were not captured as part of the population.

1.8 Organization of the Study

This thesis was organized in six chapters. Chapter One dealt with background of the study, statement of the problem, purpose of the study, research objective and questions, and significance of the study, delimitation, organization of the study and definition of acronyms. Chapter Two which is literature review looked at topics on the related literature by other researchers. Chapter Three talked about methodology which includes research design, study area, population, sampling and sample procedure, instrumentation, validity and reliability, data collection and analysis. Chapter Four was based on presentation of findings. Chapter Five was on discussion of results and chapter Six provided summary, conclusion and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter explores the views which various writers and scholars have expressed about school feeding programmes. The sub-topics of the literature review include history and rationale for school feeding programs, criteria for selection of beneficiary schools, overview of Ghana school feeding programs, roles and responsibilities of key actors in the GSFP, sanitary regulation of food vendors, role of the environmental health officer, responsibilities of caterers and cooks, knowledge of cooks and caterers on food safety and personal hygiene, the concept of the school feeding program, school feeding in other countries, objectives of the school feeding program, school feeding program as a nutritional intervention program, school feeding program as a means of improving child friendly schools and food hygiene and handling in the school feeding program, kitchen hygiene, managing waste, nutritional adequacy of the school feeding programme and summary.

2.1 Theoretical Framework

The aim of any food handlers' training program is to influence safe food handling behavior in theworkplace. However, Clayton and Griffith (2008) have shown that knowledge-based training programs do not automatically translate to safe food handling in the workplace. This has led to the call for the use of behavioral science theories to help food handlers understand food hygiene behavior (Rennie, 1995). The theoretical frameworks selected for this study were social cognition theories as propanded by Albert Bandura in 1960's. It was used to explain how humans acquire and maintain certain behaviors. The theories selected for this research were the social cognitive theory (SCT), the theory of planned behaviour (TPB), and the health belief model (HBM). According to Bandura (as cited by Cherry, 2011), "Most human behavior is learned observationally through modeling," and the mental state of the individual, along with the physical and social environment, interact to produce an observed behavior. There are three models of observational learning (modeling): a live model, a verbal instruction model, and a symbolic model. All three models operate in some aspects of both food safety training programs in Ghana. According to the HBM, an individual will behave based on his/her perception of his or her susceptibility to a serious or severe threat and whether the benefits to be derived from performing the proposed behavior to minimize the threat outweigh the barriers to performing those actions (Janz & Becker, 1984). Therefore, if food handlers perceive that their hand washing behavior, for example, can put them or the customers at risk for food-borne illnesses, and the benefits of washing hands are far greater than the barriers, the hand washing behavior will occur. This theory has been tested among food handlers (Cho, Hertzman, Erdem, & Garriott, 2012), and researchers have found that there are benefits to be derived from training.

2.2 The Concept of School Feeding

School feeding is a well-recognized safety net programme that alleviates hunger while supporting education, health and community development (WFP, 2010). School feeding can take different forms. This includes providing school meals or snacks to be eaten during school hours or distributing dry take-home food rations to pupils at the end of each month or school term if they attended school regularly. It is a versatile safety net that can be used as a platform to support children and their families in a variety of contexts. At the onset of an emergency, school feeding can be used to get food to affected communities. For example, in the aftermath of the 2004 tsunami in South East Asia, World Food Program (WFP) used schools to deliver food to those in the most affected areas. Also during economic shocks, such as those related to increasing food prices, or during protracted crises, school feeding can be an effective safety net to reinforce livelihoods and prevent those affected from adopting negative coping strategies.

2.2.1 Objectives of the School Feeding Programme

In general, three objectives can be directly associated with school feeding programs (Ahmed, 2004 & Levinger, 1986). First, SFPs can motivate parents to enroll their children and see that they attend school regularly. Second, SFPs can improve the nutritional status of school age children over time, and alleviate short-term hunger in malnourished or otherwise well-nourished schoolchildren. Third, SFPs can improve cognitive functions and academic performance via reduced absenteeism and increased attention and concentration due to improved nutritional status and reduced short-term hunger. Indirectly, by increasing the amount of food available to the household, SFPs could improve the nutritional status of household members who are not in school,

especially when SFPs entail take home rations. Overall, SFPs are appealing because if properly designed and implemented they lead to increased number of children being enrolled with better academic performances.

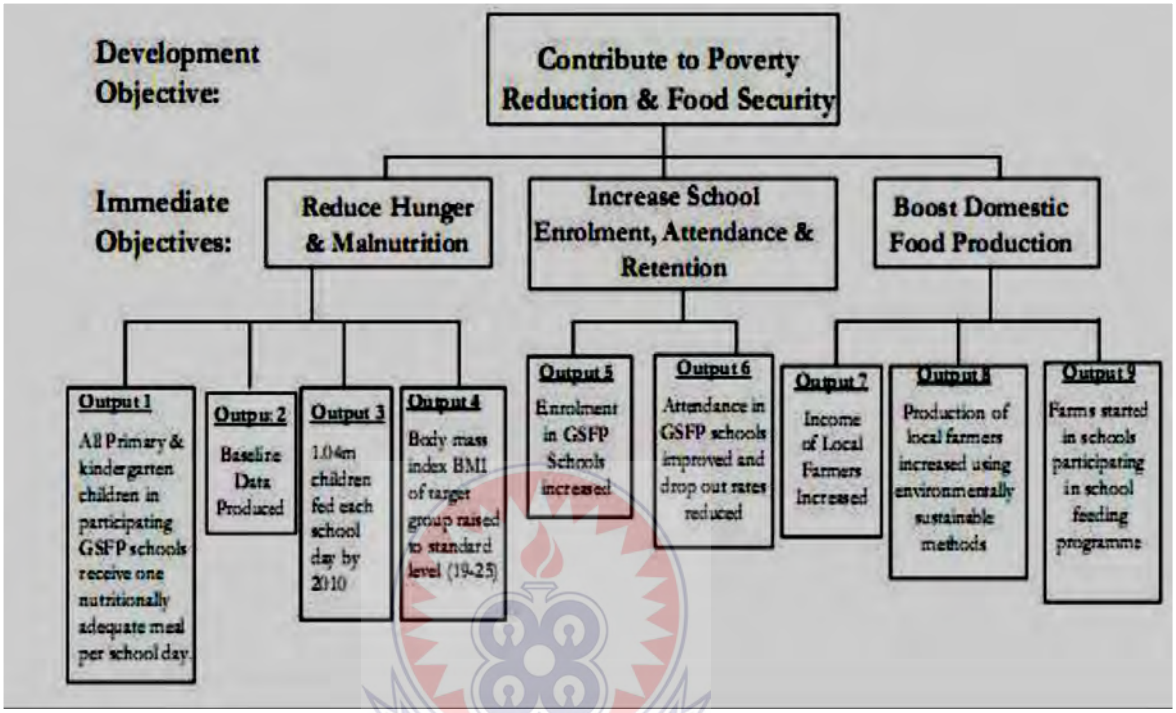

Figure 2.1: Developmental objectives and expected outputs of the Ghana School Feeding Program

The basic concept of the programme is to provide children in public primary schools and kindergartens in the poorest areas of the country with one hot, nutritious meal per day, using locally-grown foodstuffs. The long term goal is to contribute to poverty reduction and food security in Ghana. The programme objective to reduce poverty and food insecurity through the school feeding programme is anchored on the following conceptual framework:

i. Long term poor rural household and community food security is the ultimate objective. The strategy to feed school children with locally prepared food that

is nutritionally adequate will focus the spending on local foodstuffs. This will provide ready market for farm output, leading to wealth creation at the rural household and community level.

ii. This will help rural communities to generate wealth through improved incomes from the ready market for their farm output (as provided by the school feeding program).

iii With improved incomes, poor rural households can afford the additional food intake needed to ensure the full complement of nutritional needs that will address the rampant short term hunger, and the problems of under-five and maternal malnutrition**.**

2.3 History and Rationale of School Feeding Programs (SFP)

School feeding programmes (SFP) are not new. It is one of the social interventions in the last decades of the 20th century. There have been different forms of projects in countries all over the world where children received food at school, aiming at reducing malnutrition and/or improving learning abilities. Next, several SFP projects have been criticized for not being sustainable since they were dependent on imported food. On the other hand, there are people who claim that this food from outside the country is an offset for further development. Other people prefer the possibility of running SFP locally, meaning the food for the project is produced in the county itself, preferably at local level. For this to be feasible however, adequate resources are needed (Roger & Coates, 2002).

The Ghana School Feeding Programme (GSFP) categorizes as a programme belonging to the latter group since one of the main pillars of the project is to buy

locally produced products for the meals. Indeed, as will become abundantly clear in this report, the availability of a great variety of resources largely determines the success of the programme in this respect. Overall, SFP, and in particular Home Grown School Feeding Programme (HGSFP), are increasingly popular (Janke, 2001). The World Food Programme (WFP) for example puts major efforts in supporting feeding projects. Around the beginning of this year the WFP supported SFP in 70 countries worldwide, from which 40 came from Africa alone (WFP, 2006). Originally, the main arguments to start SFP were to decrease malnutrition and improve health among school-going children. The rationale behind this is that malnutrition and hunger negatively affect brain behaviour and cognitive capacities, i.e. leading to low educational outcomes. Also children's access to school, attendance and behaviour in class are affected by hunger (WFP, 2006).

School Feeding Programmes (SFPs) have a long history in Ghana. In the 1950's, pupils of several Catholic primary and middle schools were given take-home rations of food aid. The objective was to improve nutritional status of school children and increase school enrolment and retention. The programme was in line with government policy to accelerate the education and training of Ghanaians to fill job vacancies created by foreigners who had to leave the country after independence. Several agencies have been active in the field of SFP such as Adventist Development and Relief Agency (ADRA), Social Enterprise Development Organization (SEND) and World Vision International, but the World Food Programme (WFP) and Christian Relief Agency (CRS) became the two leading organizations in the field. The North of the country has always been the main target of the SFP activities because of the high food insecurity and poverty in the area. The initial objectives from the 1950's,

improving nutritional status of pupils and increasing enrolment and retention, were expanded with aims to reduce poverty, food security and gender equality.

The GSFP is an initiative of the Comprehensive African Agricultural Development Program (CAADP) Pillar III and part of government's efforts to attain the Millennium Development Goals (MDGs) One and Two, which seek to enhance food security, reduce or eliminate extreme hunger, poverty, malnutrition and achieve universal basic education and Ghana was selected as a pilot country. In 2003 a delegation of the UN Hunger Task Force in Johannesburg collaborated with New Partnership for Africa's Development (NEPAD) in laying down the principles and 'Rules of Governance' for home grown school feeding programmes (Janke, 2001). A clear NEPAD plan resulted, which was offered to all African states. Ghana was the first country to adopt the programme, and worked out a detailed implementation plan in July 2004. The execution of the Ghana School Feeding Programme (GSFP) was delegated to the GSFP National Secretariat, reporting to the Ministry of Local Governance, Rural Development and Environment (LGRDE). The school feeding plan became a substantial part of the proposal 'Imagine Ghana free of malnutrition', presented to the nation by the Ghana Health Service in March 2005.

However, to make it successful, a pilot project of ten schools, one in each of the ten regions of Ghana, was started in September 2005. The results of the pilot were sufficiently positive to start to roll out the program with three schools in each of the 138 districts of Ghana. By August 2005, it had expanded to 200 schools covering 69,000 in all the then 138 districts with a plan to reach a total of 500 schools and 155,000 children by the end of the year. Being a project, the first phase of the GSFP

was to operate for a four-year period from 2007 to 2010 by which time 1,040,000 pupils would have benefited from the program.

Accordingly, the development goal of GSFP is to enhance food security and reduce poverty (MOE, 2011). The short-term/immediate objectives are, to reduce hunger and malnutrition, increase school enrolment, attendance and retention, improve performance and boost domestic food production in deprived communities of the country. It also aims at improving the attention span and learning capacity of pupils by reducing short-term hunger and micronutrients deficiencies. In the long term the GSFP seeks to contribute to poverty reduction and food security in Ghana. The basic concept of the programme was to provide children in public primary schools of the most deprived communities of Ghana with one hot nutritious meal, prepared from locally grown foodstuffs, on every school going day.

Ghana is the first of 10 countries in Sub-Saharan Africa implementing an SFP modeled to the guidelines of the NEPAD as described in the CAADP (NEPAD, 2005). In Ghana several school feeding programmes were already implemented. The formulation of the Ghana SFP started in the year 2004 and the programme was supposed to run from January 2006 until December 2010. It was preceded by a pilot programme, which was carried out from September to December 2005 (NEPAD, 2005). In the year 2010, the programme intended to serve about 1.04 million children in all 138 districts of Ghana (Ghana, 2005; Ghana, 2006). The long-term objective of the Ghana SFP is to contribute to poverty reduction and food security. The SFP is based on locally grown food products, which should promote domestic food production and improve market access for resource-poor farmers. The government

wants to achieve this objective through an increase in employment and income level of farmers at community and national level. In addition, greater availability, access and utilization of food crops and products at community level are assumed to enhance food security.

By the end of the programme, it is expected that there will be: a real increase of 8% in income at national and community levels, an 8% increased employment at community level and a greater availability, access, utilization and stability of food crops at community level. This strategy complements the development strategies of the Government of Ghana (GOG, 2006). The immediate objectives as formulated in the Annual Operating Plan (AOP) to reach these goals are:

1. To reduce hunger and malnutrition
2. To increase school enrolment, attendance and retention
3. To boost domestic food production

2.4 Criteria for Selection of Beneficiary Schools

The GSFP has extensive targeting criteria for the selection of beneficiary communities. In several respect, the criteria are no different from targeting criteria used by WFP and other SFPs, except that WFP and the others target the north, while GSFP focuses nationally, The GSFP criteria include:

i. Willingness of a community to provide basic infrastructure (e.g. kitchen, store, dining room),
ii. Commitment of the District Assembly, demonstrated by its interest to sustain the programme,
iii. Poverty status of the district and community,
iv. Low school enrolment and/attendance and gender parity index,
v. High drop-out rates,

vi. Low literacy levels,

vii. Presence of planned health and nutritional interventions or expanding of existing ones,

viii. No participation in already existing SFP,

ix. Poor access to potable-water.

x. High community spirit and management capacity.

Using the above criteria, the Ministry of Education, Science and Sports (MOESS), working with the district assemblies, developed an initial list of communities and schools that met the criteria of poverty, high-dropout rates and low literacy (MOESS, 2005). The list generally guided the selection of communities and schools across the country.

The programme targeted the groups within the Ghanaian communities such as deprived districts (by Ghana Poverty Reduction Strategy (GPRS) classification), poorest and most food insecure districts, low literacy level districts, low school attendance rate (high absenteeism) districts, low school enrolment districts, high school drop-out rate districts, high communal spirit districts, high communal management capacity districts, increase utilization of diversified balanced local diet districts and judicious management of the environment districts.

To ensure that all the beneficiary schools have access to safe drinking water the GSFP provides poly tanks and other sanitation facilities. School children are also de-wormed occasionally to rid them of worm-infestation. With the support of NGO's such as SNV, SEND and WFP the GSFP carried out training with caterers and cooks to enhance their capacities. Indeed, their recruitment was based on academic qualification and standard hygiene. These ensured that they operated/cooked within a safe and hygienic environment.

GSFP collaborated with the Ministry of Agriculture to provide training to farmers, form cooperatives/farmer groups, and assist them to access loan facilities to increase their facilities as well as their productivity. Their produce are purchased to feed the children within the beneficiary schools. The major stake holders and strategic planners of the GSFP or the key actors for the implementation are The Dutch Government which is co-funding the GSFP with Government of Ghana (GOG). The technical partners are USAID, ADRA, SNV, SEND, WFP and CRS.

In view of these, the United Nations World Food Programme (WFP) in support of The National School Lunch Programme (NSLP) provides school meals that meet USDA (United States Department of Agriculture) nutrition guidelines and support both academic achievement and health during the day for about twenty million children in Africa including Ghana of which some selected primary schools in Koforidua are no exception.

School Feeding Programme in Other Countries

According to the National Developmenet Planning Agency (BAPPENASG), (1996), the Government of Indonesia introduced a nationai school feeding programme in the 1990s. BAPPENAS stated that the national school feeding programme was planned and funded entirely by the government. The main target of the programme were children, parent, school and broader village community (BAPPENAS, 1996 cited in Studdert, Rusmussen, Soekiman and Habicht, 2004). The programme served as intervention to reduce the poverty ratio in the country. This was then integrated into the national poverty alleviation strategy of the Sixth Five-Year Development Plan for Indonesia, using school feeding programme as a community level entry point. In

addition to this, Levenger, (1986) as cited by Del Rosso posited that the school feeding programme used mechanism for programme delivery which is innovative as compared with other Indonesia government programmes and in context of school feeding programmes internationally. To ascertain the effectiveness of the programme in Indonesia, a pilot study of the programme were carried out in the other regions of the country. This paved way for expansion of the programme in Indonesia (Del Rosso, 1999).

Following evaluation of these trials, national implementation started in 1996 for approximately 2.1 million primary school children in more than 16,000 schools in villages designated as poor according to the Inpres Desa Tertinggal (IDT) or "Presidential Instruction for Villages Left Behind" programme criteria. The criteria identified villages with economic growth less than the regional average according to a list 36 indicators of village infrastructure and household economic factors (Aziz, 1995; Bureau of Statistics, 1995). By 1998, the schools in all IDT villages were mandated to implement the school feeding programme. The implementation of the school feeding programme involved morning-snack three days a week through the school year, for a total of 108 snacks a year. Programme outline stipulated that the snack must not include the local staple foods in order to avoid the impression that the food was a main meal that replaced a meal child would otherwise receive at home. Despite protest of industry group at the time of the programme's inception, the programme outline also stipulated that industrially produced foods such as milk powder and noodles to be used (Central Coordinating Board for Child and Youth Improvement Programme, 1996). To ensure funding was directed into the local economy, only locally grown commodities could be used. The programme also

stipulated that children should receive de-worming medicine twice a year (Central Coordinating Board for Child and Youth Development Programme, 1996).

Programme funds, based on per-snack, per-child, per day amount, went directly from national level to a local bank, by passing the provincial and district level of government. There was a new approach to delivery of programme funds in Indonesia that to minimize attrition of funds that occurs as each level of government administers funds, and thus ensures that more of the allocated funds reach the targeted program beneficiaries. From 1996 to late 1998, the allocated amount was 250 rupiahs per snack in Java, Sumatra and Bali, and 350 rupiahs per snack in the rest of Indonesia (equivalent in 1996 to approximately US$ 0.15, respectively). Only the school principal could withdraw funds from the local banks to do this was required to present a menu plan signed by the village leader, the village midwife, and the heads of the local women's and school parents' associations (Studdert et el, 2004).

This process was designed to ensure that multiple local parties verify students' numbers and were aware of the funds being provided for the programme. The menu plan was prepared at the village or sub-district level with technical advice from Ministry of Health Staff. In Bangladesh, feeding children in school is a recent phenomenon. In July 2002, in order to diminish hunger in the classroom as well as to promote school enrolment and retention rates, the Government of Bangladesh (GOB) and the World Food Programme WFP) launched the school feeding programme (SFP) in chronically foods in secured areas in Bangladesh (Ahmed, 2004). The programme distributes nutrient-fortified biscuits to all children in the intervention schools (Ahmed, 2004). In addition, a small pilot programme started in 2002, distributes "tetrapack" milk and fortified biscuits to children in project schools in one of the 64

districts in Bangladesh. This pilot project is funded by the U.S. Department of Agriculture (USDA) and implemented by the Land O'Lakes Foundation.

Although in-school feeding was new in Bangladesh, the GOB devoted a significant share of its budget for over a decade to provide incentives to families to send their children to school (Ahmed, 2004). In an effort to increase primary school enrolment of children from poor families, the GOB had launched the Food for Education (FFE) programme in 1993. The FFE programme provided a free monthly ration of food grains (rice or wheat) to poor families in the rural arears if their children attended primary school. A number of studies suggested that the FFE did raise primary school enrolment (Ahmed 2000; Ahmed & Arends-Kuenning 2003; Ahmed & Billah, 1994; Ahmed & del Ninno 2002; Khanker, 1996; Meng & Ryan, 2004; Ravallion & Wodon, 1997). The Primary Education Stipend Programme (PESP), which replaced the FFE programme in 2002, provides cash assistance to poor families if they seed their children to primary school. The GOB also provide cash assistance to girls in secondary schools through four secondary school stipend programmes. These conditional cash programmes aim to increase the enrolment and retention rates of children in primary and secondary schools throughout rural Bangladesh. A recent study indicates positive influence of these programmes on educational attainment (Ahmed, 2004).

2.5 Ghana School Feeding Programme

The GSFP, an initiative under the comprehensive Africa Agricultural Development Pillar 3, seeks to enhance food security and reduce hunger in line with the Millennium Development Goals (MDGs). In an attempt to reduce poverty; The Government of Ghana with support from the Dutch government commenced the implementation of

the Ghana school feeding program (GSFP) in 2005. The objectives of the GSFP are in three (3) folds:

To increase school enrollment, attendance and retention, to reduce hunger and malnutrition and to boost domestic production (International Business Development Program, 2015). The GSFP commenced with ten (10) pilot schools, selected from each region of the country. By August 2006, the number of schools had been increased to 200 covering about 69,000 pupils in 138 districts. The basic concept of the GSFP is to provide pupils with 1 hot nutritious meal, prepared from home-grown food crops on every school going day (International Business Development Program, 2015). The ministry of Local and Rural Development has the oversight responsibility for the GSFP. The GSFP has the following as collaborating partners: Ministry of Food and Agriculture (MOFA), Ministry of Education (MoE), Ghana Education Service (GES), Ministry of Health (MoH) and other Strategic Partners (Royal Netherlands Embassy, World Food Program, Netherlands Development Organization and Food and Agricultural Organization). The Ghana School Feeding Programme (GSFP) is envisaged to become one of the core pillars of the poverty reduction in poor rural communities in Ghana. This will ensure food security at the farmer household level to meet the United Nations MDG goal of eradicating extreme poverty and Hunger-Goal 1. The strategy to feed school children with locally prepared food that is nutritionally adequate will focus 80% of the programme spending on local food stuff and therefore cutting down on post-harvest losses and provide markets for farm output, impacting the economies of rural communities (International Business Development Program, 2015)

2.6 Roles and Responsibilities of Key Actors in GSFP Implementation

The District Operations Manual of the GSFP outlines a number of roles and responsibilities for the various implementing actors of the program. The main line actors identified in the manual comprise the Ministry of Local Government and Rural Development, the Ghana School Feeding Program Secretariat, District Assemblies, District Implementation Committees (DICs), School Implementation Committees (SICs), Schools and Matrons/Caterers. In pursuit of the program objectives as stipulated in the District Operations Manual, it is expected that strong local/community participation be upheld and operations decentralized using existing structures of District Assemblies and Regional Coordinating Council offices in the implementation of the program (District Operations Manual, 2008). The Ministry of Local Government and Rural Development has the oversight responsibility for the Ghana School Feeding Programme. These are the key actors to the responsibilities they are expected to perform to ensure successful implementation of the GSFP.

According to the District Operations Manual (2008), the GSFP National Secretariat is the coordinating body of the programme and it is supervised by the Ministry of Local Government and Rural Development. The GSFP National Secretariat is to ensure that the programme provides one hot, adequately nutritious meal daily, prepared from locally produced foodstuffs to poor school children at the basic level in order to strengthen agriculture production in the poorest communities and enhance capacity of the communities to improve their food security, health and nutritional status and economic base. The National Secretariat among other things facilitate the development of a common Information, Education and Communication campaign message and ensure consistency message. Also they ensure that the District select beneficiary schools based on agreed criteria for selection of beneficiary schools, provide periodic Audit of DICs and SICs to assure consistency, ensure effective

collaboration with MoE on the education component, ensure effective collaboration with MoH on the health component, ensure effective collaboration with MoFA on the agriculture component, ensure effective collaboration with strategic Partners, provide sensitization, training and capacity and capacity to implementers and monitor and evaluate the Programme Nationwide.

The success of the programme depends on the commitment of the District (Municipal) Assembly and the beneficiary communities toward the programme and the level of readiness and interest toward the programme and the level of readiness and interest towards sustaining it (The District Operations Manual, 2008). The DA identifies and designates a staff of the Assembly as a Desk Officer to serve as a link between the Assembly and the National Programme Secretariat, opens a special school feeding bank accounts into which feeding funds from GSFP/MLGRD will be lodged, the District Finance Officer (DGD) and the District Coordinating Director (DCD) must be signatories to the accounts in line with the Financial Administration Act and be responsible for the preparation of quarterly and annual report / accounts to cover all school feeding funds received at the MMDA for onward submission to MLGRD and GSFP Secretariat. MMDA are also to select schools and caterers based on requirements set out under the programme and to ensure that basic infrastructure such as kitchen, storage place before the commencement of cooking, ensure that appointed caterers open bank accounts and payment of caterers should be strictly by cheque, interview and appoint caterers and ensure that appointed caterers / matrons are capable of cooking food in large scale basis under hygienic conditions and be able to demonstrate basic understanding of the nutritional needs of children. Besides, no procurement should be done by the MMDA on behalf of the caterers and the MMDA should ensure that caterers as much as possible buy/procure from local farmers and

producers, encourage Agriculture Extension Officers to assist local farmers to produce for the GSFP, collate information on how GSFP has linked up with farmers at the district level and ensure there is adequate water for the implementation of the programme, collaborate with community/schools to construct a simple all weather kitchen, store, canteens with seats and tables. In addition, facilitate the collection or compilation of base line and subsequent Monitoring and Evaluation data on beneficiary schools, arrange with the Ministry of Health for periodic de-worming exercise of the school children and regular education in environmental and personal hygiene as well as HIV / AIDS awareness and anti-malaria campaigns, prepare and submit to the GSFP National Secretariat quarterly monitoring reports comprising sources and uses of fund statement, bank reconciliation statement and submit consolidated financial statements to GSFP National Coordinator and the Chief Director of the MLGRD.

The District Desk Officer (DDO) is the liaison to link the DA, DIC, SIC with the Regional Coordinator and GSFP Secretariat. She/he will be responsible for the proper documentation and reporting on the GSFP. She/he act as the coordinating officer of the programme in the district, act as the focal point to coordinate activities between districts and schools, GSFP and GES, MOFA, Mo, undertake field visits to schools for monitoring, receives copies of termly and other reports from the schools and submits reports to District Assembly / DIC / Regional Coordinator.

The District Implementation Committee (DIC) is a committee designated under the Ghana School Feeding Programme. It is a District level coordinating unit for the GSFP that exercises direct oversight over beneficiary schools of the programme in the District. The DIC oversees the implementation and management of all components of

the programme at the district level. The DIC is a representation of the key decentralized departments and consist of the following: The District Chief Executive, the District Director of Education, the District Director of Health, the District Director of Agriculture, one Traditional Ruler from the District, two Representatives of the Social Services Sub-committee, one Opinion Leader from the District and the District Desk Officer (Secretary). The roles and responsibilities of DIC include ensuring that funds are disbursed on time to caterers on receipt from the GSFP Secretariat/MLGRD, ensure that the schools selected meet the criteria for legibility as indicated in this manual, promote the GSFP by informing the communities about the programme content through the community sensitization and encourage participation in meeting and ensure that the communities commits themselves to the programme, ensures that the caterers and cooks have health certificates, ensures the formation and inauguration of the SICs, provide required assistance as needed to the SIC in all areas including health, water and sanitation, hygiene, agriculture, and nutrition, follow up of the recommendations, actions and decisions to be carried out by the MLGRD and the National Coordinator of the GSFP, monitor the status and achievements of set targets (indicators both district and national) in the operations of SICs, compliance with audit recommendations at the school level, any other task as may be assigned by the NS or the MLGRD, prepare and submit end of term and annual reports on SFP activities in the district to the Regional Coordinator for onward submission to the National Secretariat and lastly, conduct periodic monitoring of quality, quantity and hygienic level of food served by the caterers and keep records of all such instances of sub-standard food so that it will be taken into consideration in the renewal of the contract of the caterer.

The School Implementation Committee (SIC) is the structure at the community level that oversees school feeding activities. Each community shall have a School Implementation Committee consisting of the following: The PTA Representative of the beneficiary (Chairperson), Head teacher of the school (Secretary), one representative of the School Management Committee, one Traditional Ruler from the community, an Assembly Member and the Boys and Girls Prefects of the school. The following are their roles and responsibilities:

1. Collaborate with the Head teachers and Caterers/Matrons in providing adequate and nutritious food for children;
2. Prepare term reports on the school feeding activities at the end of each term and each year and submit same to the district assembly that would inform payment accordingly;
3. Follow up on recommendations, actions and decisions to be carried out by the MLGRD and the Secretariats through the DICs;
4. Liaise with the DIC in collaboration with District Nutrition Officer to develop a locally and seasonally driven menu to provide nutritionally adequate meals;
5. Provide oversight and direct supervision of appointed caterers/matrons entrusted with cooking and feeding;
6. Facilitate community involvement, mobilization and support for the implementation of the programme;
7. Ensure that soap/detergents are used in washing and cleaning of hands, cooking utensils, cutlery, eating and kitchen facilities;
8. Ensure that related equipment e.g. gas cylinders and burners used in cooking are kept in good condition;
9. Arrange for security for the kitchen, store and canteen;

10. Ensure proper maintenance of the physical facilities for cooking and feeding;
11. Ensure the use of potable water and maintenance of good sanitation;
12. Report any instances of sub-standard food to the District Implementation Committee who will take into consideration during renewal of contract for caterers/matrons;
13. Liaise with the District Desk Officer and the District Health Director to ensure de-worming of the children every 6 months and education on personal and environmental hygiene as well as HIV/AIDS and Malaria;
14. Collaborate with CSOs to sensitize communities to take ownership of the program, (The District Operations Manual, 2008).

2.6.1 Sanitary Regulation of Food Handlers

The regulation of the informal food industry in relation to terms of practice, policy and access to resources is very crucial since the laws applicable to the formal food industry are not suitable to be extended and applied to the informal food industry. However, the laws and regulations governing food safety and quality in authorized and licensed premises (formal food industry) are applied to the informal food industry. Kitagwa *et al.*, (2006) is of the opinion that the laws lack proper direction and guidance for their application in the informal food industry by the implementing agents.

In Ghana the agencies that are involved in the regulating and ensuring the safety of food include the following: Environmental Protection Agency (EPA), the Food and Drug Authority (FDA), the Ghana Standards Authority (GSA), the Ghana Tourist Board (GTB), Vertinary Services Department (VSD) and the District/Municipal/

Metropolitan Assemblies. In Ghana, the Food and Drugs Law (PNDC Law 305 B) (1992), Amendment Act 523 (1996) and various bye-laws on food hygiene aim at ensuring that only safe and wholesome food, drugs and other substances are made available for public consumption. As stipulated by these laws, the sale of food under unsanitary conditions is an offence.

Kitagwa *et al.,* (2006) concluded in a study in Kenya that it is required by both the central government and local authorities that businesses are issued with trade licenses. The process of licensing food handlers involves application followed by carrying out health inspections and issuing of a health certificate, approval, payment of licensing fees and the issuance of license. This is done to improve and maintain food sanitation in the informal food industry. This conclusion is in line with what pertains in Ghana and outlined in the Bye-laws of the New Juaben Municipal Assembly (Sec. 79 of the Local Government Act 1993 (462). The laws require all persons dealing in all kinds of food in whatever form to obtain licenses. The law states that no person shall operate any business within the New Juaben Municipality area of jurisdiction without a license issued by the Assembly (Business Operation Permit; Bye-laws (Sec. 79 of the Local Government Act 1993 (462). The license shall be issued on the recommendation of the Medical Officer of health after an inspection by Health Inspectors. The license states the number, the person to whom it is issued, the premises or location, the duration and the date issued. License must be displayed at the place of sale. All licenses are subject to renewal every six months.

Another common way of regulating street vended food in developing countries is through medical examination of food handlers (WHO, 2006). Medical examination of food handlers, according to FAO/WHO (2010), is necessary if clinically or

epidemiologically indicated. This is to ensure that people with communicable diseases are excluded from food handling. In Ghana, public health requirements insist on food handlers undergoing medical screening for infectious or contagious diseases such as typhoid fever, tuberculosis, cholera, dysentery and other communicable and air-borne diseases before they start to operate. Periodic screening is also a requirement by metropolitan, municipal and district environmental health officers and inspectors. The handlers are expected to carry out complete physical and medical examination and obtain health certificates issued by the authorized health centers and hospitals. The health certificate is to be kept by the handlers, presented on inspection and renewed every six months. No person suffering from an infectious or contagious disease shall be allowed or take part in the preparation of food or allowed to handle fresh meat or fish or be present in the place of sale or storage.

Health certificates must be within easy reach on the premises for ease of inspection by the Councils Health Officers (Bye-laws of the New Juaben Municipality, Sec. 79 of the Local Government Act 1993 (462). However, some studies conducted revealed a violation of this law. For instance, findings from studies conducted in Nigeria by Musa and Akande (2003) indicated that only 30 out of 141, representing 21% of food vendors in secondary schools in Ilorin had undergone medical examination and are issued with health certificates. Respondents cited reasons for not having the health certificates as lack of funds, non-awareness and lack of strict enforcements from authorities. This finding is in line with another study carried out in Accra, Ghana by Ackah, Gyamfi, Anim, Osei, Hansen, and Agyemang (2011) in which only 40% of the respondents had acquired a health certificate. A study conducted by Abdalla *et al.* (2009) concluded that routine medical examination of food handlers must be carried

out by health officers in the development of strategic plans towards regulating safe street food handling, preparation, and vending. This regulation is however not consistent with the assertion made by Abdulssalam and Kaferstein (1993) who argue that medical examination of food handlers prior to licensing, or at intervals afterwards, does little towards ensuring food safety and should not be mandatory. That notwithstanding, as a form of precaution, Section 286 of the Criminal Code, (Amendment) Act, 2004 (Act 646) of Ghana in 2004 charges all food vendors to be examined to ensure they do not infect consumers with communicable diseases.

Protective clothing, including coat, head covering, footwear and sometimes trouser and gloves, should be worn by food handlers who cook and sell food. They should also be kept clean and neat always (Ghana Public Health Act, 2012). Hanoshiro, Morita, Matte, Matte and Torres (2004) in a study in Brazil pointed out that only 5.5% and 8% of street food handlers respectively wore caps and aprons. In another study conducted in Bloemfontein in 2006, 71% of street food handlers observed wore head coverings during food preparation (Lues, Rasephei, Mpeli & Thereon, 2006). These figures were very discouraging and showed a high health risk as was revealed in another study by Adjrah, *et al.,* (2013) that, poor hygiene practices, particularly deficient of aprons and caps wearing could be the causative factor of contamination of the analyzed samples. However, Campbell (2011) in a study in Johannesberg revealed that 90% wore aprons and 83% wore head coverings. Some food vendors do not keep the aprons and hair coverings clean. A study by Paulson (1994) revealed that (46.6%) vendors were moderately clean and clothes of (13.4%) vendors were dirty.

2.6.2 Role of the Environmental Health Officer

The Environmental Health Officer uses the knowledge and skills of the natural, behavioral and environmental sciences to prevent diseases and injury and to promote human well-being in terms of food control. Environmental Health Officers have powers to enter any food premise at any reasonable time in order to conduct the following food control duties (Ghana Public Health Act, 2012). These duties include inspection of food premises and food, sampling of food, seizure and condemnation of food which in his/her opinion is not of the nature and substances demanded by the consumer and detain as long as is necessary, review building plans, provide health education, air pollution control due to open fires and other emissions, control of food borne disease outbreaks, insect and rodent control and enforce environmental and public health laws and prosecute those who contravene the laws.

2.7 Responsibilities of Caterers/Cooks

A passion for cooking can turn into a lucrative career when you venture into catering. The duties surrounding this position may vary depending on where you work or for whom you work. While some caterers are self-employed, others may work for a catering company or event planning service. Familiarizing yourself with the responsibilities may help you when deciding which catering path one would like to take.

Krow, *(2002) in her article "Duties of a Caterer"* outlined that caterers are responsible for Food Preparation and Services which include Caterers: preparing ingredients for recipes, cooking on-site at events and serving food to guests at tableside or through a buffet system in accordance with the state health department's food safety and sanitation regulations. Also Catering companies and self-employed caterers are responsible for devising menus. This may include crafting unique recipes

and designing plate presentations specifically for a client's event. Caterers must tailor their menus to their brand and catering style. For example, a caterer who offers gourmet BBQ will keep their menu to the traditional BBQ fare, while a caterer who offers French cuisine will design menu items centered on French recipes and preparation methods. Krow further mentioned caterers should be marketers. They must advertise their catering business to their target market, such as brides and grooms if they are interested in the wedding industry. It is the caterer's responsibility to establish relationships with clients create vendor relationships and cross-promote between venues and industry-related professionals, such as photographers or event planners. Caterers may also need to manage their social media profiles, create marketing materials – such as brochures or newsletters – and attend expositions to connect with professionals and potential clients. Krow further speaks about the administrative roles of caterers such as obtaining the proper licensing from their state and county, getting the necessary permits, accounts receivable and payable, handling taxes and managing client paperwork. Self-employed caterers spend just as much time conducting administrative duties as they do preparing food. In some cases, caterers may need to hire additional service staff or professionals to lighten the load. (Krow, 2002)

Some caterers own businesses that prepare and serve food for customers. Other caterers have managerial positions in hotels and casinos. Caterers' responsibilities vary according to the size of the company or the needs of their customers, but preparing quality food is their main concern. Caterers often hire cooks, bartenders, and service personnel as needed.

Small catering firms are typically owned by one or two people. These firms specialize in providing clients with food and service for occasions such as weddings, parties, and banquets. Large catering firms handle the food service operations in such places as schools, employee cafeterias, and sports stadiums and are usually hired on a yearly contract basis. They may employ many catering managers and assistant managers as well as food service workers.

Catering involves much more than delivering and serving food. Caterers have to know how to plan menus and arrange food in an eye-pleasing way. They must establish good working relationships with a variety of customers and know how to market their services. Caterers also need to know how and where to order high-quality ingredients at the lowest possible cost. Some caterers prepare food in their own kitchens and deliver it to their customers. Others prepare food in the clients' kitchens. In either case a caterer must be a good manager, supervising the preparation activities and ensuring prompt and efficient service. Caterers often arrange to clean up after a party or after each meal in a cafeteria. Artistry and efficiency are both important in the catering business, and sometimes knowledge of specialty foods or decor is required. For instance, a client may request a tiered wedding cake or a never-been-done kind of wedding cake. Another client might want a circus theme for a child's birthday party. Industrial caterers must provide a pleasant atmosphere in cafeterias by maintaining cleanliness and providing tasty, attractive meals. Mobile caterers rent or own trucks in which they carry food to sell at busy intersections, on campus sidewalks, or near factory entrances and exits. Many states require caterers to be licensed and state inspectors visit caterers periodically to check on cleanliness and safe food handling procedures.

Caterers are cooks and food preps or meal preps (the process of planning and preparing meals), make large amounts of food for parties, galas (big parties) and events. Instead of working in a restaurant and making food to order, caterers prepare all dishes at once, course by course, so that everyone is served at the same time by banquet servers. Caterers may work with the event hosts to create a menu, work with special requests, and often cook in non-kitchen rooms or with mobile food prep stations, depending on where the event is being held. Caterers buy the food, prepare the food, move it to the location and finish off the cooking and plating so that each dish is hot and delicious, whether they are serving 10 or 1000 guests. (Shafer, 2013)

2.7.1 Knowledge of Cooks/Caterers on food safety and personal hygiene

The term food handlers apply to a person who prepares food and those who sell it, if they are different persons (WHO, 1996). Amponsah *et. al.,* (2011) asserted that the examination on knowledge on food handling and health problems of some food handlers proved that they did not fully understand hazards, their risk and methods of managing such hazards in the preparation and handling of food. WHO (1989) indicated that food handlers have very important role to ensure food safety throughout the chain of food production, processing, storage and preparation. Any disregard for safety including mishandling of food and abuse of hygienic measures on the part of food vendors may cause unpleasant consequences. In the course of packaging the food, food handlers blow air into the polythene bags to open them and in the process a number of pathogens can be passed onto the consumer. Mensah *et.al.,* (2002) are of the view that many food handlers introduce biological and physical hazards through cross-contamination and mishandling of food. The use of bare hands to serve food

increases the level of contamination as entero-pathogens survive on the hands for three hours or longer.

Pathogens can be harboured and transmitted on to others by individuals who themselves are healthy. Such people may have recently suffered an attack of food poisoning and still be carriers of the organisms in their body. In some instances, individuals who are carriers of food pathogens such as salmonella, Typhi and Bacillus cereus acts as a host over a longer period of time as they acquire immunity to the organism concerned. Such individuals might end up transmitting the organisms to other people through food without being aware of it. It is thus important that food handlers are educated on routes and means through which pathogens invade the food they prepare and sell to the public. Addo *et. al.,* (2007) intimated that food vendors who prepare and sell food are important factors that contribute significantly to food borne related diseases as they have very little or no educational background and hence have low understanding of food safety issues (Mensah *et.al.,* 1999). Most often food handlers are unaware of their roles as a reservoir of infection (Nichol & Salek, 2007). Improper handling of cooked foods and sanitation practices may therefore lead to person to person, person to food and utensils to food cross contamination resulting in outbreaks and infection from food borne pathogens. Hand-washing a simple but very effective means to reduce cross contamination is all too often forgotten by food handlers (Rippel, 2000).

2.8 School Feeding as a nutritional intervention strategy

SFPs are said to have 3 major impacts (Bennett, 2003; Hall *et al*, 2007). The 1st impact is the improvement of the nutritional status of school-going children and the

reduction of malnutrition rates. The 2nd includes the improvement of school enrolment, school attendance and cognitive performance, also reducing the gender gap herein. The 3rd impact is the effect of school feeding on the demand for locally produced foods.

Since many of the nutritional and growth problems occur in the first 2 years of life, it is appropriate to mention that a life cycle approach is needed to improve nutritional status. Improving nutritional status is thought to require a range of interventions, varying from supplementary feeding for mothers and young children to school feeding and other food based strategies (Bennett, 2003; Allen, 2001; Hall *et al* 2007). This may indicate that school feeding programmes on their own may not be sufficient to improve nutritional status of primary school children.

Some studies however indicate an improvement of Body Mass Index (BMI) in primary school children participating in breakfast supplementation programmes of 0.62 (Ahmed, 2004) and 0.23 and 0.28 in undernourished children and adequately nourished children respectively (Powell *et al* 1998). An evaluation of an SFP in Vietnam by Hall *et al.* (2007) showed that children in the SFP schools gained significantly more weight (0.24 kg, p=0.001) and height (0.27 cm, p=0.008) than children in the control group, but these increases could also be attributable to seasonal variation in food consumption and occasional de-worming and not only the food supplements. Whether the improvement of nutritional status is due to improved nutrient intake through SFPs has not been studied in much detail. A study by Meme *et al.,* (1998) indicated a higher lunch time caloric intake in children participating in an SFP compared to the control group, but no significant difference in stunting percentages could be determined.

Different studies have shown an increase in both Gross Primary School Enrolment Rates (GPSER) and Net Primary School Enrolment Rates (NPSER), an increase in school attendance rates and a reduction of drop-out rates compared to control schools (Ahmed, 2004; Bennett, 2003; Del Rosso, 1996; Powell *et al*, 1998). The fact that poorly nourished children benefit cognitively from SFPs has also been demonstrated in several studies (Allen, 2001; Grantham-McGregor, 1998; Levitsky, 2005; Powell *et al*, 1998). In all these studies a significant increase was detected in school test-performance between under-nourished children receiving breakfast or lunch and children in the control group not receiving breakfast or lunch at school.

Another aspect of SFPs is the reduction of the gap between boys and girls in education and nutritional status. Reducing the gender gap requires a greater increase in primary school enrolment of girls than boys and the difference between gross enrolment for boys and girls tends to be smaller in SFP-schools (Allen, 2001). In Food for Education (FFE) schools in Bangladesh where take home rations were provided to children, a 44% increase in enrolment for girls and a 28% increase in boy enrolment was found (Ahmed, 2004). Also the World Food Programme (WFP) found a 7% increase in net enrolment rate in Bolivian girls, when providing take home rations to girls showing a 90% attendance over a given time span (WFP, 2006). Powell et al., (1998) indicated a greater improvement in height, weight and BMI was in girls than boys which suggests that if girls are enrolled in schools, their benefit from an SFP is greater compared to boys.

The last aspect of SFPs is that of boosting local food production. The evaluation of the schools of the Ghana SFP by Berkeley University of California in 2006 indicated

that participation of the local farmers is limited and most food is procured at large markets instead of in surrounding villages and farms, and therefore they conclude that connection between local agriculture and the Ghana SFP was weak. In the review report of the World Food Programme (2006) it was suggested, that the use of locally grown food expected to create additional demands of 2.0 million metric tonnes of maize for school feeding, 5.4 million metric tonnes for Food for School (FFS) take-home rations only, and million metric tonnes for FFE (that is school feeding plus FFS take-home rations) for entire Sub-Saharan Africa (WFP, 2006). The Catholic Relief Services also implements and recommends in its best practices the use of locally available vitamin and mineral foods, but does not give an indication of the extent of the use of these foods, nor of consequences for the demand for these foods in the local community (Janke, 2001). At moment, few empirical evidence is available that show the ability to help local farmers using locally produced foods for SFPs, according to Ahmed Akhter (IFPRI, 2004).

2.9 School Feeding Programme as a means of improving Child Friendly Schools

Two main strategies have been used to improve the nutritional status, attendance rates and cognition of school age children: 1. The provision of meals and snacks for eating in school and, 2. Food for Education (FFE) interventions in which food given at school may be taken home. These strategies are underpinned by hypothetical pathways that link the provision of school meals with improved education access and achievement, in two ways. Firstly, educational outcomes may improve through increased enrolment and time in school due to reducing the cost to the parent of sending a child to school and benefits to the family from providing take home food. Secondly, educational outcomes may improve through enhanced attention, cognition

and behaviour resulting from relief of hunger and from better nutritional status (if the quality and quantity of food is adequate and the supply continues for some time).

Grantham-McGregor and Walker (1998) reviewed studies showing associations between current nutrition and school performance (enrollment, attendance, achievement, classroom behaviour, and school drop-out). They found a large number of studies that showed children who were stunted, anemic, or iodine deficient had poorer school achievement levels and attendance than other children. Fewer studies had examined the experience of hunger, missing breakfast, or poor dietary intakes but most found associations with school performance.

In a more recent review, Grantham-McGregor (2005) notes that further associations have been reported between experience of hunger and children's psychosocial function or behaviour, academic attainment and attendance. She points out, however, that most studies have failed to control adequately for all possible socio-economic background variables associated with hunger, which are likely to independently affect children's school performance. Rigorous short-term studies of missing breakfast have generally shown detrimental effects on children's cognition whereas studies of providing breakfast have shown benefits particularly in malnourished children. But classroom conditions may modify the effects of breakfast on behaviour.

Grantham-McGregor found that there have been very few longer-term studies of the effects of giving school meals and nearly all involved breakfast. She notes that it has proved extremely difficult to run robust trials of school feeding, partly because feeding children tends to be an emotional and politically sensitive topic, which makes it difficult to have children in a control group. She found only one longer term randomized controlled trial, conducted by Powell *et al.,* (1998), which found benefits

associated with attendance and arithmetic performance. This study is reviewed further below. Less robust studies comparing participants with non-participants or comparing matched schools have found benefits of receiving breakfast but there was bias due to self-selection and schools may have been inadequately matched. Grantham-McGregor (2005) concludes that most studies of giving breakfast have found benefits to school performance through increased attendance and retention. However, many had serious design problems, were short-term, and were not conducted in the poorest countries. She argues that in order to advise policy makers correctly, there is an urgent need to run long-term randomized controlled trials of giving school meals in poor countries and to determine the effects of age and nutrition status of the children, the quality of the school, and the timing of the meal. She emphasizes that the special needs of orphans should also be considered.

The study by Powell *et al.,* (1998) demonstrated that hunger during school may prevent children in developing countries from benefiting from education. Compared to school feeding programmes, Food for Education (FFE) includes a broader range of interventions designed to improve enrollment, attendance, community-school linkages, and learning. The United Nations World Food Program (WFP) is the largest organizer of FFE throughout the world. In 2003 WFP provided food to schools in 70 countries, accounting for more than 15 million children. Once school feeding programmes have been launched, complementary activities such as de-worming and HIV prevention education can piggyback these programmes to maximize the benefits of food aid (World Food Program, 2003). FFE involves the distribution of food to "at-risk" children (usually girls, orphans or other vulnerable children) who attend school regularly as a stimulus to increase participation, and to help offset some of the

opportunity and cash costs of educating children. The food may be locally grown and purchased or contributed by aid donors. Where FFE also includes food-for-work, targeted to teachers or parents involved in activities to improve schooling outcomes, it can be used to boost efforts to improve both the demand (enrollment and attendance) for education and the supply (quality) of education, which are of course interrelated and mutually reinforcing.

Levinger (2005) points out, however, that to be effective FFE interventions must reflect local education supply and demand realities. She argues that if such responses result in contextually appropriate designs then FFE can be a powerful tool for development but warns that the potential of FFE can only be realized if a full analysis of the supply and demand blockages is undertaken. For example, where educational quality is high but demand low FFE can best be used to improve recruitment, but where quality is low but demand high it needs to be used to modify what happens in the classroom.

The importance of school feeding programmes is discussed by Levitsky (2005) who notes that the most robust finding from the evaluations of these programmes is that they increase attendance and asks why governments have not used this evidence to initiate more school feeding programmes for the poor. Levitsky (2005) argues that there is a need for more research to make similar links between school feeding programmes and their long-term financial and social benefits in order to build cogent economic and political arguments that will influence policy and funding decisions.

2.10 Food Hygiene and handling in the school feeding programmes

According to Codex Alimentarius Commission (2009), food hygiene involves all conditions and measures necessary to ensure the safety and quality of all stages of food chain. These include sourcing of raw materials from the right supplier, good storage system, temperature control, maintenance, proper waste management and pest control system, available cleaning regime, personnel training and good personal hygiene, transporting and distribution food under safe condition. With these measures, food hazards (physical, chemical, biological) could be controlled and thus lead to safe food and safety of the consumer.

Walker *et. al.*, (2003) argued that food handlers usually cross-contaminate processed foodstuff and are likely to under-cook food properly and improperly store food. It is possible that in most cases, they contaminate processed foodstuffs without being aware that they are doing so. Continuous training and education thus become very essential if food handlers are to handle food in a hygiene and safe manner with the best preventive measures being educating the food handler on good personal hygiene and food safety. Marth (1985), however observed that food handlers are usually young, itinerant and inexperienced people who usually stay on the job for a year and hence it becomes extremely difficult to find and educate them whiles actively working. In relation to this Walker *et. al.,* (2003) asserted that there is a high probability that the absence of continuous training and reinforcement is to be blamed for lack of food hygiene knowledge concerning a number of aspects in safe food production. A lot of studies have confirmed the rather low level of knowledge of food handlers on hygienic and microbial safety to ready-to-eat foods (Walker *et al 2003*., & Tebutt, 1992).

Inadequate hygienic knowledge and lack of understanding of the basic principles of food hygiene is therefore a major bottleneck to the implementation of good hygiene practices in the handling of ready-to-eat foods in our schools and other public places. In this connection, Ehiri & Morris (1994) were of the view that there is the need to conscientiously prevail upon and motivate food handlers to put to practice their knowledge in food hygiene. In contrast to assertion made by Walker *et. al*, (2003), it is a common place knowledge that ignorance coupled with reluctance by food handlers to apply the acquired knowledge also contribute in no small measures to food poisoning by food handlers (Bryan, 1990). Further, Angelillo *et. al,* (2003) indicated in a study conducted in Italy that although food handlers had positive attitude towards food safety, it was not supporting their practice in food handling. There seem therefore to be no collaboration between good knowledge in food handling and the actual practice in food processing among food handlers.

Mensah *et. al.,* (2002) posit that the hygienic aspect of food vending operation is also a major source of concern. For example, food stands (structures on which foods are displayed) are often crude structures, and running water may not be available in the canteen. Also toilets and washing facilities are rarely available. The washing of hands, utensils and dishes is often done in buckets or bowls. Disinfection is not usually carried out and insects and rodents may be attracted to sites where there is no organized sewage disposal.

The Ghana Public Health Act (2012) defines food handling as manufacturing, processing, producing, packing, preparing, keeping, storing, transporting or displaying food for sale or for serving. Increased handling of food is responsible for a more complicated and critical challenge of protecting food from contamination. Good

hygiene practice in food preparation and food service plays an important role in ensuring food safety. This is achieved by following the general rules of good food hygiene and other approaches like HACCP. Fosket & Ceserani (2007) stated that poor hygienic practices can contribute to outbreaks of food borne illnesses. It is therefore important that food establishment management/owner provides methods and means of handling that prevent damage to or deterioration or contamination of any food product.

2.10.1 Receiving Food

At delivery food handlers should visually inspect product. Food should ideally be stored on shelves at least six inches off the floor. The six-inch allowance will allow for easy cleaning and will discourage pests while the shelves will assist in air circulation. Open food should be stored in covered containers and raw foods should be stored under cooked or ready-to-eat foods to avoid cross contamination (such as dripping). All foods should be properly marked and dated and at no time should chemicals be stored in the same area with the food.

2.10.2 Storage of Food

All foodstuffs undergo unwanted changes during storage if not kept under proper conditions. Foods are divided into three main groups for the purpose of storage; they are perishable foods, dry foods and frozen foods. Perishable foods include meat, poultry, game, fish, dairy produce, fats, vegetables and fruits, are obtained on daily bases for use. Dry foods include cereals, pulses, sugar, flour among others. Cool refrigeration, frozen and dry storage are among the methods of food preservation. Cool storage refers to storage at temperatures above freezing point from about 16^0C

down to -2^0C while frozen refers to storage at temperatures -18^0C or below to maintain food (Fosket & Ceserani, 2007). Dry storage refers to holding of foods above ambient temperatures. Dry storage is used in the storage of food grains such as maize, beans, flour, and potatoes.

Most disease causing bacteria can grow within a temperature range of 5^0C to 60^0C, commonly referred to as the food temperature danger zone (McSwane, Rue & Linton, 2000; Frazier & Westhoff, 1988). It is further recommended that all cold foods must be stored at 5^0C or below and all hot foods held at 63^0C or above. Ghana's law requires that storage of food should be under such conditions as shall prevent contamination, including development of pathogenic or oxygenic microorganisms or both (Ghana's Public Health Act, 2012). To ensure the maintenance of all potentially hazardous food at the required cold temperatures during storage, refrigerators and freezers should be equipped with a numerically scaled thermometer (McSwane, Rue & Linton, 2000). It is also important that these thermometers are tested for accuracy at regular intervals (National Board of Experts-HACCP, The Netherlands, 2002).

2.10.3 Chilling

Chilling is a process that involves cooling food by ice or by mechanical refrigeration as a temporary measure to preserve food until some other preservative process is applied (Frazier & Westhoff, 1988). It was further stated that the foods that need to be chilled include eggs, dairy, meats, seafood, vegetables and fruits. The World Health Organization's Ten Golden Rules for Safe Food Preparation states that putting too large a quantity of warm food in the refrigerator is a common error responsible for countless cases of food borne diseases. This result in the center of food remaining

warm (above 10^0C) for too long, hence microbes thrive, quickly proliferating to disease causing levels. Food intended to be stored especially for longer periods should be cut/divided into smaller portions, put in plastic freezing bags, and then rapidly frozen.

Separating raw products from ready-to-eat food is important to prevent cross contamination from bacteria such as *Campylobacter*. Ways to separate food include separating fresh produce and raw meat into different grocery bags and wrapping meat in a container or bag to prevent dripping of raw meat's liquid residue on ready-to-eat foods. Most cases of *campylobacteriosis* occurred from cross-contamination or ingestion of raw meat (CDC, 2009). A small dosage of juice from raw meat is sufficient to cause illness from *Campylobacter* (Tauxe, 1992; CDC, 2009). Cleaning any surface or utensils after contact with raw meat or poultry is important to prevent foodborne illnesses outbreak from pathogens such as *Campylobacter jejuni* and *Salmonella spp* (Fein, Jordan Lin, & Levy 1995; Hillers, Medeiros, Kendall, Chen, & Dimascola, 2003). Researchers reported that only about two thirds of food handlers clean their cutting board after handling raw meat or poultry (Altekruse, *et al*., 1995).

Bekker (2003) noted that dry storage refers to the holding of foodstuff or food at room temperatures (10^0C to 21^0C). The foods stored under these conditions include grains e.g. beans and maize, canned foods, and oils. Separate storage is normally required for the storage of other non-food items such as cleaning equipment, detergents, insecticides and equipment used in preparation, cooking and serving of food. However, if these items are stored in the same store with the food items, separate facilities should be provided and the necessary precautions to prevent contamination should be observed (McSwane, Rue & Linton, 2000).

2.10.4 General Storage Rules

Bekker (2003) and McSwane, Rue and Linton (2000), agreed on the following general rules for storing food.

1. Cooked foods should be kept well separated from raw food and covered to reduce the risk of cross-contamination.
2. Food should be kept off the floor and away from walls.
3. First-in-first-out (FIFO) system of stock rotation should be implemented.
4. Arrangement of items in stores should be well done and coded/marked for ease of identification and removal for use.
5. All foods should be stored in an orderly fashion so as to facilitate ventilation and assessment of food to detect deterioration.
6. Any shelf or display case used for displaying or storing food or any container shall be kept clean and free from dust or any other impurity.

2.10.5 Washing

Poultry, fish, and meat should be washed with lukewarm water followed by a cold rinse shortly before cooking so as to remove every bit of dirt and some microorganisms like Salmonellas. Fruits and vegetables should be thoroughly rinsed with water before eating raw or used for preparing food. Utensils including the cutting board should be washed with soap and warm water between each preparation (Bekker, 2003; Frazier & Westhoff, 1988).

Washing hands prior to handling food is crucial in preventing foodborne illness from pathogens such as *Norovirus* and *Salmonella*. *Norovirus* can be transmitted from

touching ready-to-eat food with hands contaminated with the pathogen. The Centers for Disease Control and Prevention (2010) recommended washing hands before, during and after food preparation to prevent the spread of *Norovirus*. Food experts also recommended washing hands after touching a pet and before preparing food to prevent *Salmonellosis* (CDC, 2009). A study reported that only 66 percent washed their hands after handling raw meat or poultry, although 86 percent knew that hand-washing can lower the risk of foodborne illness (Altekruse *et al.,* 1995). Another study indicated that 40 percent of the foodborne illness outbreaks in fresh produce was caused by poor personal hygiene and improper contact with sewerage. Since most middle school children reported that they helped prepare food (Byrd-Bredbenner, Schaffner, & Mauer Abbot, 2010; Haapala & Probart, 2004), hand washing is crucial in preventing food borne illness. A study demonstrated that school children who washed their hands four times daily had 24% fewer absences caused by breathing-related problems and 51% fewer absences caused by stomach cramps, compared to children who did not wash their hands (Master, Longe, & Dickson, 1997).

2.10.6 Cooking

Proper cooking of potentially hazardous foods destroys harmful micro-organisms that may be present in the food however, different foods and the methods, by which they are cooked, require different end point temperatures to be safe. The range of safe cooking temperatures can vary from 63^0C to 74^0C (McSwane, Rue, & Linton, 2000) but it is recommended that the core temperature of all parts of the food must reach at least 70^0C within a period of 2 hours (Frazier & Westhoff, 1988). The South Africa (1997), states that the time and temperature of cooking should be sufficient to ensure destruction of non-spore forming pathogenic micro-organisms. However, spores of

certain bacteria like *Clostridium botulinum*, *Clostridium perfringens* and *Bacillus cereus* can survive cooking temperatures (Frazier & Westhoff, 1988).

Frozen meat, fish, and poultry must be thoroughly thawed before cooking so as to result in better return of moisture to the cells hence gaining look of original food (Frazier & Westhoff, 1988). They further state that this should be done slowly and be well controlled, reasonably rapid thawing is recommended to prevent the possible growth of micro-organisms. Inadequate cooking is a common cause of foodborne illness. Food handlers are recommended to avoid eating raw or uncooked eggs to prevent illnesses from *Salmonella intrepidities* (Hillers, *et al.*, 2003). Undercooked meat could contain harmful bacteria, such as *Salmonella* spp., *Campylobacter jejuni* and *E. coli* O157:H7 which contribute to foodborne illness outbreaks (Hillers, *et al*., 2003). DeWaal and Robert, (2013) speculated that 43% of beef-associated outbreaks were caused by undercooked meat. One-fourth to three-fourth of all meat and poultry sold in 1999 was contaminated with at least one pathogen (Medeiros, Hillers, Chen, Bergmann, Kendall, & Schroeder, 2004). Hence, it is important to cook food until the proper temperature to kill these pathogens. A study reported that approximately 60 to 70% of food handlers cooked their hamburgers to the proper temperature (Altekruse *et al*., 1995).

2.10.7 Cooling, Reheating, and Holding of Food

Cooling refers to the removal of heat energy (Potter & Hotchkiss, 1998). Proper cooling of food after cooking prevents the conversion of spore forming bacterial cells to vegetative bacterial cells and the growth of vegetative bacterial cells. During cooling, food must be cooled to 21^0C within two hours and from 21^0C to 5^0C within

an additional four hours (McSwane, Rue, & Linton, 2000). When dishes containing a mixture of cooked and raw ingredients such as salads are being prepared, it is important to cool the cooked component before mixing with the other ingredients. Spores of certain bacteria like *Clostridium botulinum*, *Clostridium perfringens* and *Bacillus cereus* can survive cooking temperatures therefore, during reheating the food should be reheated to 74^0C within two hours to prevent the numbers of organisms that may have grown during the cooling process from reaching levels that can cause food borne illness (McSwane, *et al.,* 2000).

Holding of food implies keeping or retention of semi-finished or finished food for a period of time under specified temperatures and may be done during cooking, cooling, reheating, and food preparation. During these activities, the amount of time the foods stay in the "temperature danger zones" must be minimized to control microbial growth. The National Board of Experts- HACCP, The Netherlands (2002) and McSwane, Rue and Linton (2000) are of the opinion that foods should be held for a minimal amount of time during preparation in the "temperature danger zone" (5^0C to 60^0C) to control microbial growths and should pass through the danger zone as few times as possible. Hot food should be cooled and reheated only one time, if not used up after first reheat the food should be discarded.

2.10.8 Serving of Food

Food should be handled, served or sold with clean equipment and utensils that is tongs, forks, spoons or disposable gloves and never handled with bare hands. Utensils/cutlery should be clean and dry and not handled by touching the food contact surfaces (McSwane, Rue, & Linton, 2000) and plates filled with food should not be

stacked on top of the other during display, storing or serving. Clean tongs, forks, spoons or disposable gloves should be used when handling street – vended foods. Good personal hygiene should always be practiced when serving food, by wearing a clean uniform and hair restraint and wash hands after handling money and before handling food again (National Board of Experts, The Netherlands, 2002).

2.11 Kitchen Hygiene

Shiny, spotless kitchen may not show it, but it is a hot bed for bacterial activity! Ensuring proper hygiene in the kitchen when cleaning, preparing, cooking, and storing food is critical in order to prevent food-borne illnesses including diarrhoea, E coli, hepatitis A, gastroenteritis, and salmonella poisoning. Washing hands, cleaning sponges and dishcloths, sanitizing kitchen surfaces and cutting boards, and knowing how to handle produce and raw meats are essential parts of kitchen hygiene. In most homes, the kitchen is the hub of activity. It's where all the delicious food is, it's also where one unpack groceries and prepare meals, where the kids do their homework, and pets keep a keen eye on anything that lands on the floor! Since kitchens are most likely the busiest part of one's home, it is imperative to maintain good kitchen hygiene. To keep your food safe and germs and illnesses at bay, look at some easy-to-follow rules for kitchen hygiene and safety.

2.11.1 Wash Hands

This one sound obvious and simple but is probably the most effective thing one can do to maintain good kitchen hygiene. Many illnesses spread from person to person when someone does not wash their hands before handling food. In fact, 25% of all food-borne diseases arise from poorly washed or unwashed hands! So, before

touching any sort of food in your kitchen, whether raw or cooked, always make sure to vigorously wash hands. Use a gentle soap and lukewarm water to scrub the hands – especially in between fingers and under fingernails for at least 20 seconds. Rinse well and use a clean paper towel to dry hands.

2.11.2 Sanitize Sponges and Dishcloths Periodically

It may not look like it, but dirty and contaminated sponges and dishcloths are the perfect host for rapidly growing bacteria. Every few days, soak dishcloths and sponges for a few minutes in a solution of 1 tsp liquid chlorine bleach and one quart of warm water to clean and disinfect them. Change dishcloths and sponges every few months especially if they continue to smell bad despite disinfecting.

2.11.3 Clean Counters

Kitchen counters see a lot of activity throughout the day. Between grocery bags, crumbs, spills, homework, and arts and crafts projects, a counter has a pretty rough life. It is important, therefore, to thoroughly clean a kitchen counter every week with detergent and hot water or a solution of water and liquid chlorine bleach. Leave the solution on for about 10 minutes and then wipe down with disposable paper towels.

2.11.4 Sanitize Cutting Board

The average kitchen cutting board has around 200% more faecal bacteria in and on it than a typical toilet seat! Let that sink in for a bit! Cutting boards can indeed be hotbeds of bacteria activity so it's critical to keep them clean. After each use, wash cutting board with warm soapy water, rinse well, and wipe down with a paper towel. Once a week, sanitize cutting board with a solution of 1 tbsp. liquid chlorine bleach

per gallon of water. Gently pour the solution on the cutting board, allow it to sit for about five minutes, rinse with warm water, and dry with a paper towel. The FDA also recommends the use one cutting board for bread and fresh produce and another for seafood, raw meat, and poultry to avoid cross-contamination.

2.11.5 Clean Refrigerator

Fridge can be a breeding ground for bacteria if not cleaned regularly. Wipe off any spills inside the fridge immediately and give it a once-over with some warm water and a small squirt of dishwashing liquid every week. Also use a solution with 2 table spoon of baking soda in 1 quart of warm water and use this to wipe down your fridge. Cleaning fridge regularly also lets one detect hidden items in the fridge that are well past their prime. Make sure to toss out all food that is past its “use by” date. Also clear any spoilt veggies or debris from food and produce. As a general rule of thumb, one should also thoroughly clean fridge once in three months or so. For an effective deep clean, take out all the shelves and clean the interior walls with hot water and a mild liquid detergent. Rinse gently with water and wipe with paper towels. Clean shelves in the sink with hot water and detergent too. Make sure to scrub any stains or spills.

2.11.6 Handle Raw Meat with Caution

Always be sure to separate raw meat, seafood, and poultry from other items in your shopping cart, grocery bags, and the fridge. Also designate a cutting board just for these items to avoid cross-contamination with fruits and veggies. If freezing meats to use later, put them inside plastic freezer bags, seal, and store in the freezer until ready to use. When one needs to thaw meat, remember to do so either in the fridge overnight, in a bowl of cold water, or in the microwave – never at room temperature

on the kitchen counter or in the sink. Never dry hands using a paper towel that was previously used to clean raw meat or raw meat juices. Doing so can transfer bacteria from the juices onto hands, eventually spreading throughout the house! It is also extremely important to cook meat, seafood, and poultry to the right internal temperature to destroy harmful bacteria. Using a food thermometer comes highly recommended. The following is a handy guide for internal cooking temps, as recommended by the FDA:

i. Poultry: Cook to 74°C;
ii. Egg dishes: 71°C;
iii. Pork, lamb, veal, and beef: 62.8°C;
iv. Ground meat: 71°C;

The FDA also recommends that refrigerate leftovers containing meat, seafood, and poultry within two hours of cooking, or within one hour if outside temps are in the 90°C.

2.11.7 Clean Fresh Produce

Grocery store shelves where fresh produce is stocked are rife with dirt and bacteria that can cause food-borne illnesses. So it is vital to clean fresh produce as soon as one gets them at home. Clean fruits and vegetables that have thick skins with a vegetable brush to scrub away harmful microbes. Veggies like broccoli and cauliflower should be soaked in water for about two minutes before cleaning. To clean leafy greens, soak them in a large bowl of cool water or a solution of water and vinegar for about five minutes. Rinse well and drain with a colander. Use commercially sold fruit and vegetable rinses as well, but research shows that they are not any more effective than using a homemade water-vinegar solution.

2.12 Environmental Hygiene (Managing Waste)

According to FAO/WHO (2002) humans produce all kinds of refuse when trading. Without care, the refuse can endanger consumer health. It is in fact a major source of contamination of food products and food preparation and vending premises. Effective measures are therefore needed for the hygiene and sanitation of food preparation and vending sites and raw material and ingredient storage areas to prevent the contamination of food and surroundings. All waste should be handled and removed in such a way as to prevent the contamination of food, water and environment. Special care should be taken to keep insects, rodents, dogs, cats and other animals away from food waste. Contamination of food, water and environment can be avoided by putting waste in waterproof covered bins. Care should be taken that the bins are not allowed to overflow and are emptied daily. Liquid waste, such as wastewater, should be separated from solid waste. Liquid waste (except oils and fats) should drain into a sewer through a device (e.g. filter) that retains any solids present. Fatty waters should be eliminated by appropriate means, such as grease tanks. Solid waste should be placed in closed dustbins that are emptied at least once a day into the municipal refuse skip.

2.13 Nutritional adequacy of the School feeding programs

School feeding programmes (SFPs) in both developed and developing countries target vulnerable groups lacking adequate food (Del Rosso, 1999; Florencio, 2001; Murphy, Calloway, & Beaton, 1995). The SFPs have traditionally focused on improving recipients' food intake, health, and nutrition status. Foods provided alleviated short-term hunger and increased food intake. Feeding programmes also provided nutrition

education, enhanced values formation, and increased academic performance (Florencio, 2001). The SFPs exist globally by many names basically for the purpose of delivering better nutrition to children. Schools or government then modify or broaden the programmes' nutrition objectives upon identification of specific nutritional deficiencies or problems. While protein-energy malnutrition and micronutrient deficiencies, particularly of iron, iodine, and vitamin A, remain as the dominant problem in many countries, others already have eradicated under-nutrition and addressed obesity and diet-related chronic degenerative diseases (Florencio, 2001). Some countries face the coexistence of both over- and under- nutrition.

The SFPs also educate children about food, nutrition, and health practices. Many developing countries undertook supplementary feeding programmes mainly because of "free" food donations provided by developed countries with surpluses. Discontinuation of "free" food donations led to individual countries' governments assuming programme management. The heavy reliance on donated commodities and problematic developmental management has limited developing nations' progress toward programme growth and effectiveness (Florencio, 2001).

The nutritional adequacy of meals provided at school is critical to meeting health and educational objectives. Providing healthy meals in schools require that continuous assessment be done to ensure nutritional adequacy (Del Rosso, 1999). Societies generally desire to avoid nutritionally-related problems of underweight, stunted growth, muscle wasting anemia, obesity, dental problems, hypertension, cancers, and diabetes (Baker, CarroII, & Champagne, 1997; Ho, Gould, Jensen, Kiser, Mozar, & Jensen, 1991; Hoover, Martin, Fox, Lan, & Ahmad, 1998; Seaman, Bower, & Fleming, 1997; Seaman & Young, 1996).

In the review of the pilot of the Ghana SFP of 2006, an improvement of health status and nutritional status of children in SFP schools was suggested, although based on anecdotal evidence rather than objective and quantitative data (Ghana, 2006c). A small effect of SFPs on the nutritional status of school children has been demonstrated in a few studies. However, it is not yet clear if the effect on nutritional status can be attributed to the implementation of an SFP. Ministry of Foods and Agriculture (MOFA).

i. The Women in Agriculture Development (WIAD) unit of MOFA took participants through food-based nutrition Education and Diet improvement. The caterers and cooks were encouraged to cultivate suitable food items that provide nutrients needed for the health and development of children and others household members. They should prepare meals that will provide the nutrients required for various stages of development e. g. infancy, school-going age, adolescence, the aged. Eat appropriate combined foods for the required nutrients needed for good growth and development. Therefore, in planning of balanced diets, Ghanaians foods which have been grouped into six classes must all be taken into consideration when planning a menu for schools and households (MOFA, 2006). These classes include Animal Products, Legumes and oil seeds, Fruits and vegetables, Grains, cereals and cereal products, Fats and oils and Roots, Tubers and plantain.

2.14 Summary

School feeding programmes are a common phenomenon in both developed and developing countries. These programmes were initiated primarily to enhance the

nutritional and health status, as well as the academic performance, of school children. This is in line with the theoretical frameworks selected for this study which is social cognition theories that are used to explain how humans acquire and maintain certain behaviors. Monitoring and evaluating school feeding programmes help ensure that meals provided are hygienic and contain adequate nutrients in order to realize programme aims. Key actor's role and other factors perceived to impact the effectiveness and quality of the programme were also reviewed. From the literature reviewed, while developed countries continue to monitor, evaluate and improve programme delivery through research, particularly on the hygienic and nutritional quality of school food service meals, such initiatives are lagging behind in developing countries of which Ghana is no exception. Fosket and Ceserani (2007) stated that poor hygienic practices can contribute to outbreaks of food borne illnesses. This can contribute to malnutrition, hunger, parasitic infections and other diseases. However, health and hygiene education still remains one of the challenges in the implementation of the Ghana school feeding programme to the limited knowledge of some caterers/cooks on hygiene practices. Some practices by the food handlers were found to be the primary means or source of transmitting hazards into food. Addo *et. al.,* (2007) intimated that food vendors who prepare and sell food are important factors that contribute significantly to food borne related diseases as they have very little or no educational background and hence have low understanding of food safety issues (Mensah *et.al.,* 1999). Lack of sensitization training aimed at certifying the caterers/cooks to ensure that food prepared for pupils is hygienic and nutritious for their healthy growth for the full benefit for the school feeding. Monitoring and advocating the hygienic practices of caterers/cooks of the programme to make it more effective is lagging behind.

It is therefore important that food establishment management/owner provides methods and means of handling that prevent damage to or deterioration or contamination of any food product. Because of the limited research in developing countries, this study was based on hygienic practices of caterers/cooks in the Ghana School Feeding Programme. Inadequate hygienic knowledge and lack of understanding of the basic principles of food hygiene is therefore a major bottleneck to the implementation of good hygiene practices in the handling of ready-to-eat foods in our schools and other public places. In this connection, Ehiri and Morris (1994) were of the view that there is the need to conscientiously prevail upon and motivate food handlers to put to practice their knowledge in food hygiene. Further, Angelillo *et. al,* (2003) indicated in a study conducted in Italy that although food handlers had positive attitude towards food safety, it was not supporting their practice in food handling. There seem therefore to be no collaboration between good knowledge in food handling and the actual practice in food processing among food handlers.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter discusses the methodology adopted in the study. It briefly spelt out the general research design, study area, the target population, sample and sampling procedure, research instrument, data collection procedure, data analysis, ethical consideration and limitation. The secondary data included documentary source of the policy framework on the School Feeding Programme in Koforidua Municipality, published studies and texts. The primary data were the responses to instruments from caterers, head teachers, and P. T.A. Chairmen at both GES and District Assemblies of the selected schools.

3.1 Research Design

The research design used for the study was mixed method. According to Frankel & Wallen (2000), research design is a method or process of obtaining information from a large group of people by setting carefully worded questions and carefully administered questionnaire. Newman (2007) also sees it as asking respondents about their beliefs, opinions, characteristics, past and present behaviour. According to Creswell (2012), Mixed Method research design is a type of educational research in which the researcher decides what to study; asks specific, narrow questions, collects quantifiable data from participants (a large number of participants); analyze these numbers using statistics; and conducts the enquiry in an unbiased, objective manner.

It is a procedure for collecting, analyzing, and "mixing" both quantitative and qualitative research and methods in a single study to understand a research problem. The mixed design used was the convergent design. In convergent design, the researcher collects quantitative and qualitative data concurrently, analyze the two data separately and mixes the two database by merging the results during interpretation (and sometimes during data analysis). It is used to obtain a more complete understanding from two databases, corroborate results from different methods and compare multiple levels within a system. Hence, the use of the mixed method is justified since the study sought to find out the hygienic practices of caterers/cooks in the Ghanaian school feeding programme in Koforidua Municipality.

The design was chosen because it has the merits of lending itself to teams. It also intuitive and efficient to use. In spite of this, the researcher had to ensure that the questions to be responded to using convergent design are clear and not misleading because the results obtained requires substantial effort and expertise. Also there are issues related to the sample and sample sizes, difficult to converge two sets of different data as well as how to resolve discrepant results. Notwithstanding these limitations, the researcher believed that the research design was the appropriate design which could help make direct contact with the caterers/cooks, PTA chairmen, head teachers and enabled the researcher to draw useful and meaningful conclusion from the study.

3.2 The Study Area

This study was conducted in Koforidua Municipality which is the capital of the Eastern Region of Ghana, founded in 1875. In recent times Koforidua has been experiencing a rapid population growth. According to the Statistical Service, the

population of Koforidua in the 2010 census was 183,727. This rapid growth rate can be attributed to a number of factors which include: Natural population increase and migration of people to the regional capital (Ghana Statistical Service, 2010). This implies that majority of the people both young and old, males and females come to Koforidua for various reasons; for example; to seek for greener pastures, white collar jobs, education, trade, medical care, visit places of interest, and also do some shopping. All these changes have become necessary due to economic trends and hardship. This has also affected the home as most women too have taken to the job market instead of keeping the homes as housewives.

This increase in population has brought about a great increase in birth rate hence, a great number of schools springing up in Koforidua and its suburbs to cater for children of school going age. Majority of the parents especially mothers leave home very early for their numerous activities therefore have less time to cater for the feeding of their wards before going to school in the morning. As part of one of the social intervention goal, Koforidua as a beneficiary town of the school feeding programme has incorporated this in many schools to cater for these unfortunate pupils who do not eat or have enough food to eat in the morning to benefit from the programme to avoid absenteeism, malnutrition and other social vices in the municipality.

3.3 Population

Neumann (2007) defines population as the large general group of many cases from which a researcher draws a sample. The study area and the population comprises of fifty-four (54) schools who qualify for the school feeding programme in the New

Juaben Municipality. It consists of the caterers/cooks, head teachers and PTA (Parent Teacher Association) chairpersons in charge of the school feeding programme of the qualified schools. All the one hundred and eight (108) caterers/cooks, fifty-four (54) head teachers and fifty-four (54) PTA chairpersons are from schools in the rural and deprived communities in the New Juaben Municipality in Koforidua in the Eastern Region. These are the school in the municipality that qualified for the school feeding programme. Schools with asterisks (*) were purposely selected.

Table 3.1: Enrolment figures of schools on feeding programme in the New Juaben Municipality

S/N	NAME OF SCHOOL	TOTAL
1*	APIMPOA ISLAMIC PRIMARY A & KG2	235
2	APIMPOA ISLAMIC PRIMARY B & KG	231
3*	K'DUA KHALID IBN WALID ISLAMIC PRIMARY	200
4	MAHD-DEEN ISLAMIC KG/PRIMARY A&B	197
5	ADA FALAHIYA BASIC SCHOOL	161
6	K'DUA ADA KYEREMANTEN M/A PRIMARY	348
7*	BORNYA KING OF GLORY PRESBY BASIC	272
8*	TROM NYEREDE M/A PRIM/KG	324
9*	KORLE NKWANTA GOOD SHEPHERD A&B	257
10	NYEREDE R/C BASIC SCHOOL	147
11	ADWESO ST. DOMINIC R/C PRIM/KG	444
12*	AKWADUM METHODIST BASIC SCHOOL	265
13*	AKWADUM ISLAMIC KG/PRIM	132
14*	AKWADUM M/A BASIC SCHOOL	152
15	AKWADUMJ R/C KG/PRIMARY	205
16*	ASOKORE METHODIST KG/PRIMARY "A"	275
17	ASOKORE METHODIST KG/PRIMARY "B"	271
18	ASOKORE R/C KG/PRIMARY "A&B"	280
19*	ASOKORE SALVATION ARMY PRIMARY/KG	411
20	ASOKORE SDA COLLEGE DEM. "A" PRIMARY	303
21	ASOKORE SDA COLLEGE DEM. "B" PRIMARY/KG	338
22	ASOKORE SDA COLLEGE DEM. "C" PRIMARY	295
23	FREMAN METHODIST PRIMARY/KG	221

24	WESLEY METHODIST PRIMARY	270
25	EFFIDUASE R/C PRIMARY/KG "A"	243
26*	EFFIDUASE R/C PRIMARY/KG "B"	245
27	EFFIDUASE METHODIST "A" PRIMARY	85
28	EFFIDUASE METHODIST "B" PRIMARY	77
29	EFFIDUASE METHODIST "C" PRIMARY/KG	130
30	EFFIDUASE PRESBY "A" PRIMARY/KG	362
31	EFFIDUSASE PRESBY "B" PRIMARY/KG	258
32	OKOMESU M/A PRIMARY	8
33	ASIKASU PRESBY KG/PRIMARY	155
34	JUMAPO METHODIST PRIMARY/KG	259
35*	JUMAPO PRESBY BASIC SCHOOL	248
36*	JUMAPO ST. STEPHEN'S ANGLICAN PRIMARY/KG	270
37	MPAEM M/A KG/PRIMARY	70
38	SUHYEN SDA PRIMARY/KG	269
39	SUHYEN METHODIST PRIMARY/KG	129
40	DENSUNO M/A BASIC SCHOOL	209
41	K'DUA NSUKWAO M/A BASIC SCHOOL	215
42	NANA OWARE AGYAPONG M/A SCHOOL	143
43	NEW JUABEN M/A PRIMARY	258
44	SARKODEE M/A BASIC SCHOOL "A"/KG	100
45	SARKODEE BASIC SCHOOL "C"/KG	100
46	NANA K. BOATENG "A" PRIMARY	137
47	NANA K. BOATENG "B" PRIMARY/KG	276
48	NANA K. BOATENG "C" PRIMARY/KG	299
49	NANA K. BOATENG "C" PRIMARY/KG	260
50	OYOKO CATHOLIC PRIMARY/KG	263
51	OYOKO METHODIST PRIMARY/KG "A"	201
52*	OYOKO METHODIST PRIMARY/KG "B"	194
53*	OYOKO PRESBY BASIC SCHOOL	187
54	K'DUA FREMAN LEMMENS R/C PRIMARY	377
	TOTAL	**12329**

Source: Field work, 2017

3.4 Sample Size

The sample size was sixty (60) comprising fifteen (15) head teachers (9 males and 6 females), fifteen (15) PTA chairpersons (all males), and thirty (30) caterers/cooks (all females). The fifteen selected schools in the New Juaben Municipality include Apimpoa Islamic Primary A & Kg 2, K'dua Khalid Ibn Walid Islamic Primary, Bornya King Of Glory Presby Basic, Trom Nyerede M/A Prim/Kg, Korle Nkwanta Good Shepherd A&B, Akwadum Methodist Basic School, Akwadum Islamic Kg/Prim, Akwadum M/A Basic School, Asokore Methodist Kg/Primary "A", Asokore Salvation Army Primary/Kg, Effiduase R/C Primary/Kg "B", Jumapo Presby Basic School, Jumapo St. Stephen's Anglican Primary/Kg, Oyoko Methodist Primary/Kg "B", Oyoko Presby Basic School.

3.5 Sampling Procedures

The sampling techniques that were used to select the sample for the study was purposive sampling. Neuman (2007) defines purposive sampling as a type of nonrandom sample in which the researcher uses a wide range of methods to locate the subjects. The primary consideration of purposive sampling is the judgment of the researcher as to who can provide the best information to achieve the objectives of the study. The researcher only goes to those people who in her /his opinion are likely to have the required information and be willing to share it. This type of sampling is extremely useful when you want to construct a historical reality, describe a phenomenon or develop something about which little is known. Based on this, caterers and cooks were selected. Only schools in deprived areas in the New Juaben Municipality in Koforidua in the Eastern Region were purposively selected for the study. From the study population, a sample size of sixty (60) were selected for participation in the study. The sample of sixty (60) respondents is shown in Table 3.2

Table 3.2: Sample Size

Category	Number of Respondents	Percentage (%)
Caterers/Cooks	30	50
Head teachers	15	25
PTA chairmen	15	25
Total	**60**	**100**

The purposive sampling was used to select fifteen (15) main caterers and fifteen (15) head cooks from the selected fifteen (15) schools. The fifteen (15) head teachers as well as the fifteen (15) PTA chairmen were also selected using the same procedure. They were mainly selected because of the people that run the programme. This was done to fish out information from them on how they run the SFP in the beneficiary schools in the municipality.

3.6 Research Instrumentation

The research instruments used to gather data for the study were observation checklist, structured interview guide and questionnaire. Observation is a method of data collection that employs vision as the main means of data collection. The structured observation guide used employs formal and strictly organized procedure with a set of well-defined observation categories. Observation offers the researcher the opportunity to obtain first-hand information on participants with or without their knowledge. The

observation was conducted using an observation checklist designed by the researcher. Critical attributes in catering industries were used to assess the practices of the food handling, availability of equipment and tools, and the sanitation of the environment from where the food is prepared among others. A check of "Yes" or "No" was made against all the attributes observed. Direct observation was used during the data collection session. The caterers/cooks were given prior information that they would be observed. The researcher also applied a time allocation to the method of data collection. A time allocation involves the researcher selecting a time to conduct an observation and recording what the participants were doing when participants were first seen and before participants realized the researcher was watching (Brown, 2010). The purpose of developing the study with the elements of a direct observation coupled with time allocation was that even though the participants were aware they were being watched, time allocation assisted in alleviating the participants' knowledge of when the researcher would be watching their actions. The disadvantages of conducting an observational study are reactivity and observation bias. Reactivity is the influence that an observer has on the behaviour under observation even though the behaviour influenced by an observer may not be representative of the behavior when an observer is not present (Shaughnessy, Zechmeister & Zechmeister, 2002). A sample of an observation checklist can be found in Appendix B.

A structured interview is a data collection procedure in which the interviewer asks the respondent oral questions and demand oral answers (Babbie, 2001). A structured interview is in reality a questionnaire read by the interviewer as prescribed by the researcher (Ary, Jacobs, Razavieh & Sorensen, 2006). The interview guide was made up of both close ended and open ended questions. According to Neumann (2007) open

ended questions are unstructured to which respondents give any answer to enable researchers learn how a respondent think to discover what is actually important to him or her or an answer to a question with many possible answers. Close ended questions on the other hand are structured and responses are fixed and allows for easy coding. Close ended questions are known to provide control over the participant's range of responses by providing specific response alternatives (Borden & Abbott, 2002). This makes it easier to summarize and analyze the responses. The interview guide consisted of 45 questions made up of both open and close ended questions and sub divided into sections. Section A was made up of roles of caterers/cooks, head teachers and PTA chairpersons, Section B was on caterers'/cooks' knowledge on food industry and regulations governing their operations, Section C was basically on personal, food and environmental hygiene of caterers/cooks and Section D was on nutritional adequacy of the meals prepared. Interview was used for this study because some of the respondents (caterers/cooks) could not read or write. A copy of the interview guide is attached as Appendix A.

A structured questionnaire consisting of both close and open ended questions was also used to collect primary data for the study. According to Neumman (2007), open ended questions are unstructured to which respondents give any answer to enable researcher learn how a respondent think to discover what is really important to him or her or to get an answer to a question with many possible answers. Closed-ended questions on the other hand are structured and responses are fixed and allows for easy coding. Close-ended questions are known to provide control over the participant's range of responses to provide specific response alternatives (Borden and Abbott; 2002). This makes it easier to summaries and analyze the responses. To cross check information

provided by the respondents, the researcher had a comprehensive study of caterers/cooks who are operating the school feeding programme to confirm it.

The questionnaire was self-designed by the researcher and was organized into four sections. Section A was made up of roles of caterers/cooks, head teachers and PTA chairpersons, Section B was on caterers'/cooks' knowledge on food industry and regulations governing their operations, Section C was basically on personal, food and environmental hygiene of caterers/cooks and Section D was on nutritional adequacy of the meals prepared.

The reason for using the questionnaire method as an instrument for data collection was based on the fact that it provides a wider coverage of the sample and also it facilitates the collection of a large amount of data (Fraenkel and Wallen, 1993). Questionnaire method was appropriate in this study because all respondents were literates. A sample of the quationnaire can be found in Appendix C.

3.7 Validity and Reliability

Validity is the degree to which an instrument measures a certain parameter and achieves the desired results as it is designed to perform (Ary, Jacobs, Razavieh & Sorensen, 2006). Reliability on the other hand is the degree of accuracy or precision in the measurement made by a research instrument (Kumar, 2005).

To ensure the validity of the instrument, the questionnaire and observation checklist were submitted to the research supervisor for in-depth scrutiny. It is unusual, if nearly impossible, that an instrument be 100% valid, so validity is generally measured in

degrees. As a process, validation involves collecting and analyzing data to assess the accuracy of an instrument. In addressing the issue of reliability in the study, the researcher used triangulation. Triangulation allowed the researcher to compare results from different methods of data collection (May & Pope, 2000). In cases where the data collected or the responses given by the respondents were not clear, the researcher also had the opportunity to go back to some of the respondents especially the stakeholders to crosscheck with them the data collected and to find out if the data collected had been captured appropriately (Winter, 2008). Five (5) copies each of the questionnaire and observation checklist were pre-tested on caterers/cooks, head teachers and PTA chairmen who had similar characteristics as those sampled for the main study. Respondents used for the pilot study were beneficiaries of the SFP in Koforidua Municipality but from a school which fell outside the selected schools. This enabled the researcher to access the reliability of the questions and removed ambiguous questions that may crop up and also to verify the clarity and understanding of respondents of the data collection instrument to determine the amount of time required to complete the data collection. Based on the results of the exercise, the instruments were revised to remove any ambiguity. (See Appendix B and C). Through the responses from the pilot study, the researcher saw the need to use research assistants to help with the observation of the caterers/cooks to prevent any biases that may occur during the actual study. The pilot study also helps the researcher to verify clarity, understanding of the questionnaire by respondents and to determine the amount of time required to complete the filling of the questionnaire.

3.8 Trustworthiness

Trustworthiness or rigor of a study refers to the degree of confidence in data, interpretation, and methods used to ensure the quality of a study (Pilot and Beck, 2014). It deals with credibility, transferability, confirmability and dependability. Credibility is a study or the confidence in the truth of the study and therefore the findings, is the most important criterion (Pilot and Beck, 2014). It is how confident the qualitative researcher is in the truth of the research study's findings or how true and accurate the finding is. Transferability is how the qualitative researcher demonstrate that the research study's findings are applicable to the other context, that similar situations, similar population, and similar phenomena. Confirmability is the degree of the neutrality in the research study's findings. This means that the findings are based participant's responses and not any potential biases or personal motivations of the researcher. This involves making sure that what the research participants said fit a certain narrative. Dependability is the extent that the study could be repeated by other researchers and that the findings would be consistent. In other word, if a person wanted to replicate one's study, they should have enough information from one's research report to obtain similar findings as the study did. To examine if the research study's findings are credible, transferable, confirmable, and dependable, copies of the interview guide were pre-tested on caterers/cooks, head teachers and PTA chairmen who had similar characteristics as those sampled for the main study. Respondents used for the pilot study were beneficiaries of the SFP in Koforidua Municipality but from a school which fell outside the selected schools. This enabled the researcher to assess the trustworthiness of the interview questions and removed ambiguous questions and also to verify the clarity and understanding of respondents of the data collection instrument to determine the amount of time required to complete the data

collection. Based on the results of the exercise, the instruments were revised to remove any ambiguity.

3.8 Data collection procedure

The nature of data is qualitative and the collection procedure was based on primary source. The collection procedures were based on interviewing and observation. Kumar (1999) sees observation as a purposeful, systematic and selective way of watching and listening to an interaction or phenomenon as it takes place. The type used was a non-participant observation where the researcher is involved in the activities of the group but remained a passive observer, watch and listen to its activities and draw conclusions from it. Kumar also defines interview as interaction between two or more individuals with a specific purpose in mind. Both structured and unstructured interviews were used to solicit for in-depth information from the respondents. In the structured interview, the investigator asks a predetermined set of questions, using the same questions as specified in the interview schedule, which is a written list of questions, both closed and open ended prepared to be used by an interviewer. In an unstructured (in-depth) interview, the interviewer develops an interview guide within which to conduct the interview. The interview was self-designed by the researcher and organized in sessions for the information needed. The reason for using observation, discussion and interview as an instrument of data collection was the fact that they provided a wider coverage of the sample and also facilitate the larger amount of data (Fraenkel & Wallen, 1993). These instruments are appropriate in this study because not all the respondents are literates.

3.9 Data Analysis

Primary data collected from the field was edited to eliminate errors by the respondents and analysed thematically. According to Kusi (2012), a thematic analysis is done when the researcher immerses himself in the data, organizes it, transcribes it, generates themes and codes for the data and describes them. The results were presented in themes using tables and percentage of respondents.

3.10 Ethical Considerations

Ethical approval and administrative permissions for the study was obtained from the front desk officer in charge of the Ghana School Feeding Programme at the District Assembly in Koforidua Municipality prior to collection of data from the selected study setting. Attached is the application letter used to seek for the permission (see appendix D). The respondents were assured of the confidentiality of their responses and provided with informed verbal consent so participation could be voluntary. The respondents were free to back out anytime they felt uncomfortable. Fortunately, none of them backed out anymore.

3.11 Limitation of the Study

The researcher encountered the challenge of having to convince the caterers/cooks on the school feeding programme that, the information they give would not be used against them since most of them thought their unacceptable practices would be reported to the authority's in-charge of the operations or published in the newspapers. Also, the respondents did not give a clear picture of how they practiced proper hygiene when they realized they were being observed. When they were aware that unknown individuals were watching their actions, they became more conscious of their hygienic activities and performed better to clear the suspicion. The researcher

therefore employed the services of research assistants who posed as teachers on teaching practice and parents to observe the caterers/cooks using predesigned observation checklist without the knowledge of the operators. The conduction of interviews, observation and administering of questionnaire were tedious and time consuming which prolonged the duration for data collection.

One of the limitations of the study was the inability to use a much larger sample size. This was not possible because of the time duration, the rather busy schedules of the head teachers and mostly the uncooperative attitude of caterers. That notwithstanding, the findings can however be generalized for the entire SFP in the Koforidua Municipality, but with caution

CHAPTER FOUR

RESULTS

4.0 Introduction

This chapter deals with the results or findings of the study. The findings are basically discussed around the parameters set for the research. The first section focused on the demographic characteristics of caterers and cooks, head teachers and chairpersons.

4.1 Demographic Characteristics of Caterers/Cooks

Demographic data on characteristics such as gender, age of respondents and educational background are pieces of information that are relevant in such a study.

Table 4.1 Gender of Respondents

Gender	Frequency	Percentage (%)
Female	36	60.0
Male	24	40.0
Total	**60**	**100**

The gender of the respondents reveals in Table 4.1 that majority of the respondents who participated in the study were 36 females representing 60.0%, as against 40.0% of the 24 respondents who were males.

Table 4.2: Age Distribution of Respondents

Category	Age	Frequency	Percentage (%)
Cooks/ Caterers	30-39	5	8.4
	40-49	14	23.3
	50 and above	11	18.3
PTA Chairmen	30-39	2	3.3
	40-49	6	10.0
	50 and above	7	11.7
Head teachers	30-39	2	3.3
	40-49	1	1.7
	50 and above	12	20.0
Total		**60**	**100**

The age groups of respondents as presented in Table 4.2 showed that the caterer/cooks category had 5 (8.4%) of the entire respondents falling between 30-39 years, 14 representing 23.3% were between the ages of 40-49 and 11(18.3%) were between the ages of 50 and above. The PTA chairperson's category had 2 (2.3%) of the entire respondents between the ages of 30-39, 6 (10%) between the ages of 40-49

and 7 (11.7%) were 50 years and above. 12 of the head teachers representing (20.0%) were 50 years and above, 2 93.3%) were between the ages of 30-39 and 1(1.7%) was between the ages of 40-49.

Table 4.3: Educational Background of Respondents

Category	Educational Background	Frequency	Percentage (%)
Caterers/Cooks	Basic Education	5	8.3
	Secondary Education	14	23.3
	Tertiary Education	11	18.3
PTA Chairmen	Basic Education	1	1.7
	Secondary Education	11	18.3
	Tertiary Education	3	5.0
Head teachers	Basic Education	0	0.0
	Secondary Education	5	8.4
	Tertiary Education	10	16.7
Total		**60**	**100**

On the educational background of caterers/cooks, Table 4.3 above shows that 16.6% had received basic education, 46.7% attended secondary school while 36.7% have attended tertiary schools. Interestingly, all the PTA chairmen have also had a formal education ranging from basic up to the tertiary level. All the teachers and head teachers per the Ghana education policy have attained secondary and tertiary education.

4.2 Responsibilities of the caterers and cooks

Responsibilities of the caterers and cooks are presented under this section. This section presents finding on the **Research Question 1:** *What are the responsibilities of the caterers and cooks?*

Under this research question, the researcher elicited responses from the caterers and cooks on their responsibilities as far as their involvement in the school feeding programme is concerned.

When this question was asked; *what are your primary responsibility in the School Feeding Programme?* One of the caterers and cooks said, "we *are responsible for the buying of all the food items we use in the school, and other things we may need. Just that our money keeps delaying and our creditors are always on our necks. All the things we need for the school feeding we have to either buy or credit them. We are also responsible for buying all the food and cooking items, paying the cooks and some of us have even had to look for a place to cook for the children.''*

On the other hand, another cook said, *"my main responsibility in the school feeding programme is to follow the menu given to us by our madam for the week, so we make sure we prepare the food we have every day. We use the food items at our disposal and we make sure we prepare the food under hygienic environment as possible. Another responsibility as a cook is to prepare the meals we have on the menu. We also ensure that we prepare healthy meals under safe environments."*

When this question was asked, *how do you people procure or buy your items*? Majority (24) of the respondents (caterers and cooks) said, "*we procure all the*

foodstuff sometimes from the markets and most times we procure them directly from farmers".

Also when this question was asked, *do you caterers and cooks follow the procurement process?* The respondents said, all along the entire procurement process of buying the food stuffs are followed to ensure that they are in good conditions. This implies as caterers or cooks one need to know how and where to order high-quality ingredients at the lowest possible cost.

When this question was asked once again, *do you have well established procurement models for procuring your goods*? The caterers indicated that "*there are no established procurement models or procedures that serve as guiding principles for them with regard to how the foodstuff should be purchased on the programme.*"

Respondents were asked whether they had any experience in catering industry. Majority of the respondents (70%) have had experience in catering industries before. However, 30% of the respondents have not had any experience with catering industry. This question was asked to solidify answers as to the level of experience and its relationship to the roles they play.

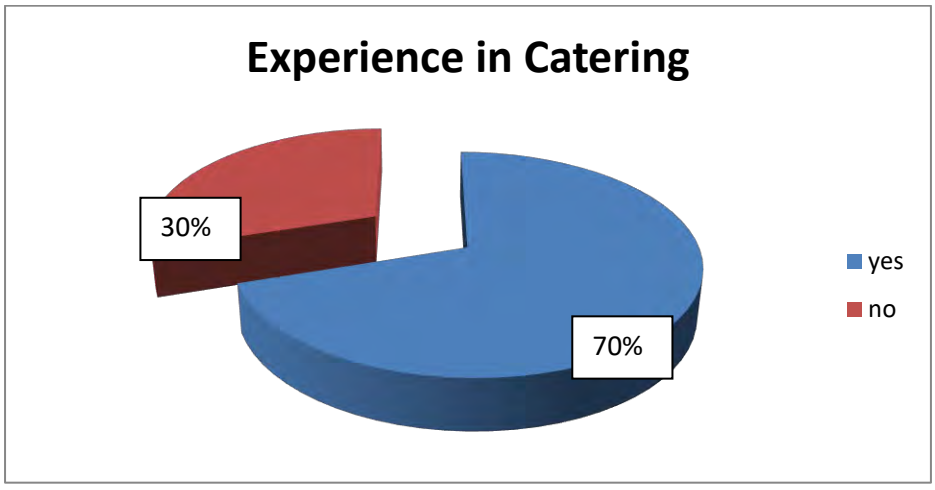

Figure 4.1: Experience in Catering

Source: Field work (2017)

As indicated in Figure 4.1, majority of the respondents (21) have had experience in catering industries before. However, 9 of the respondents have not had any experience with catering industry.

4.3 Awareness of rules governing catering industry

Awareness of rules governing catering industry in the school feeding programme was presented on this section. The theme was used to answer the **Research Question 2:** *To what extent are caterers aware of rules governing catering industry?* This research question sought to find out from the caterers and cooks whether they are aware of rules governing the catering industry. Results provided by respondents are presented in Table 4.4.

Table 4.4: Awareness of rules governing catering industry

Responds	**Frequency**	**Percentage (%)**
Yes	30	100
No	-	-
Total	**30**	**100**

Responding to the question of whether or not respondents were aware of rules governing the catering industry, all the caterers and cooks responded in the affirmative that they were aware of rules governing catering industries.

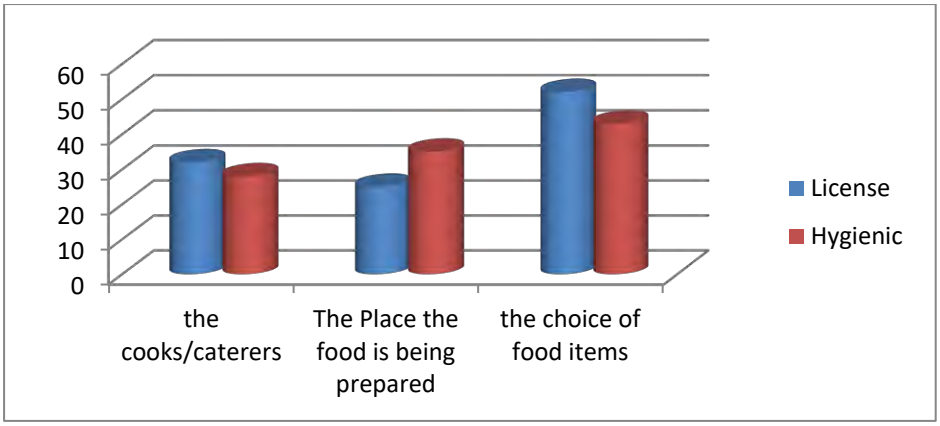

Figure 4.2: Knowledge on Rules in Catering

Source: Field work (2017)

When respondents were asked to mention some of the rules they know in governing the catering industry, 32% of the respondents indicated that they were aware that caterers and cooks must acquire the requisite license to qualify them to operate and that they should always operate under hygienic environments.

About 23% of respondents again said they were aware that they were supposed to seek for permission/license for the place(s) where foods are prepared for the public consumption and the place should be hygienic for that purpose. However, 14 (47%) of the respondents indicated that they were aware that places where food items are procured from were supposed to be certified by professional environmental and sanitation officers to ensure that foodstuff used are hygienic and safe. In addition, respondents were asked if they possessed a valid license that permit them to operate as caterers and cooks as shown on Table 4.5 below.

Table 4.5: Valid license that permits them to operate as caterers/cooks

Responds	Frequency	Percentage (%)
Yes	18	60.0
No	12	40.0

Total	**30**	**100**

In response, 60% of the caterers/cooks indicated they had valid licenses that permits them to operate as caterers and cooks. They reiterated that their possession of a valid license formed part of the basis for their selection. However, 40% of the caterers indicated that they do not have valid licenses but were in the process of securing a valid license.

Table 4.6: Roles of Head teachers and PTA Chairmen in the school feeding program

Role	PTA Chairmen	Head teachers	Frequency	Percentage
Supervise cooking	4	15	19	63.6
Offer support	4	0	4	13.4
Check quality of food.	3	0	3	10.0
Monitor cooks dressing.	0	0	0	0
Cooking	0	0	0	0
Total	**15**	**15**		**100%**

Source: Field work, 2017

The respondents were asked the particular roles they play in the school feeding program. Their responses are shown in Table 4.6. To this question, four (4) of PTA chairpersons indicated that they were involved in the supervision of the cooking, four (4) showed that they offered support to head teachers in the overall supervision of the programme, whilst three of the PTA chairpersons indicated they were involved in the checking of quality of the food prepared. Also, all the head teachers indicated they played the supervisory role by supervising the caterers and the cooks.

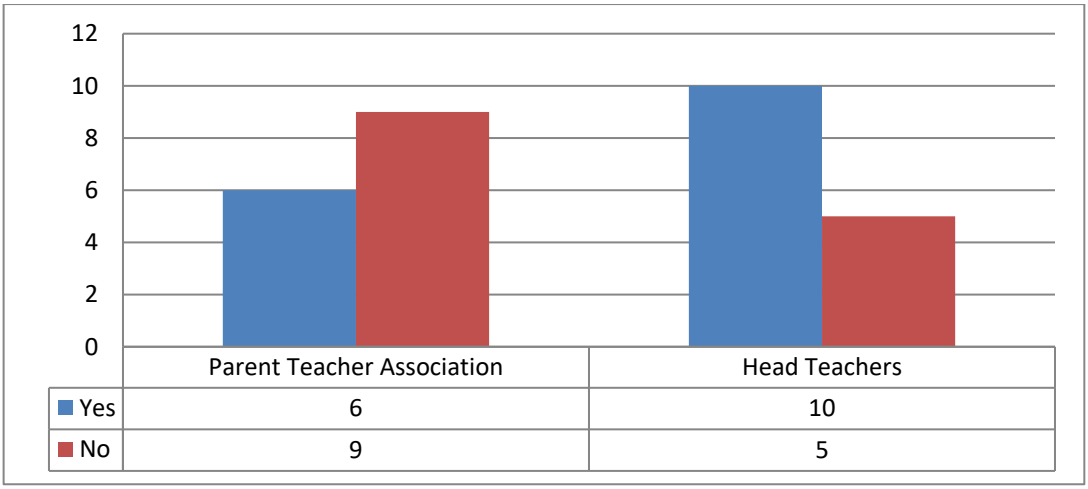

Figure 4.3: Inspection of License of caterers/cooks.

Source: Field work (2017)

The PTA chairpersons and head teachers were asked whether they inspected the license of the cooks and caterers contracted to serve their schools and their views are shown in Figure 4.3. As observed, majority of the PTA chairpersons indicated that they did not inspect the license of the cooks/caterers contracted to serve their schools but majority (10) of the head teachers inspected the license of the cooks/caterers.

4.3.1 Assessing the performance of caterers/cooks by Head teachers and PTA chairpersons

When head teachers and PTA Chairmen were asked how often they assessed caterers/ cooks performance in terms of hygiene, head teachers said they did that thrice in a term whereas PTA chairmen said they did that once every term.

4.3.2 Sanctions by Head teachers and PTA Chairpersons on caterers/cooks

When head teachers/PTA Chairpersons were asked if they sanction the caterers/cooks who do not possess license as well as perform as expected, all of them said they first warn them and later report them to the district assembly for failure to comply with what is expected of them.

4.4 Personal, environmental and food hygiene status of the caterers/cooks in the school **feeding programme.**

Personal, environmental and food hygiene status of the caterers/cooks in the school feeding programme are presented under this section. The above theme was to derived from **Research Question 3:** *What are the personal and environmental hygiene of the caterers in the school feeding program?* Responding to research question 3, the researcher posed a number of questions to respondents. The responses are presented in Table 4.6 below.

Table 4.7: Personal hygiene of the caterers in the school

Statements	**Yes**		**No**		**Total**	
	N	**%**	**N**	**%**	**N**	**%**
Cooks and caterers put on clean cloth or dresses	19	66.7	11	33.3	30	100
Wear protective clothing	14	45.8	16	54.2	30	100
Caterers ensure cooks put on clean cloth or dresses	24	87.5	6	12.5	30	100

sanction them for not practicing proper personal hygiene that can cause food infestation	27	93.7	3	6.3	30	100
Undertaken any medical checkup	24	87.5	6	12.5	30	100
Received any training in food hygiene and safety	22	79.6	8	20.4	30	100

Referring to Table 4.7, 66.7% of the cooks and caterers responded 'Yes' to the question that posed to find out if 'Cooks and caterers put on clean cloth or dresses'. Also, 54.2% of the cooks and caterers responded 'No' when they were asked whether they wear protective clothing while going about their responsibilities as far as the school feeding programme is concerned. This indicates that the cooks are not adequately protected when they are performing their responsibilities with respect to preparing food for school feeding purposes.

87.5% of the cooks and caterers resoundingly indicated in their response that they ensured that both the cooks and caterers put on clean cloth or dresses. Again, 93.7% of the respondents indicated that they are sanctioned for not practicing proper personal hygiene that can cause food infestation. Furthermore, 87.5% and 79.6% caterers/cooks also responded 'yes' to the questions that sought to find out whether they undertake any medical checkup and whether they received any training in food hygiene and safety respectively.

Table 4.8: Where did you receive the training?

Responds	**Frequency**	**Percentage (%)**
From home (from mother)	7	23.33
From formal training (vocational school)	13	43.34
From health professional/environmental and sanitation officers	10	33.33
Total	**30**	**100**

When respondents were asked where they received their training in food hygiene and safety, 29.15% of both caterers and cooks indicated that they had their

training from home (from their mothers) and another 29.15 had formal training from a vocational school as represented in Table 4.8. The remaining 41.7% indicated they had their training from health professional/environmental and sanitation officers.

Table 4.9: Treatment of foodstuffs (vegetables from the market) before using

Responds	Frequency	Percentage (%)
I wash them with water	18	60.0
I use vinegar to wash them	12	40.0
Total	**30**	**100.0**

Table 4.9 shows that 60% of those who responded to this question indicated that in preparing the food, they washed vegetables and other foodstuff with water. However, the remaining 40% said they used vinegar to treat vegetables before using them.

Table 4.10 shows the results on whether some of the cooks/caterers store leftover foods after serving.

Table 4.10: Store leftover food after cooking and serving

Responds	Frequency	Percentage (%)
Yes	13	43.4
No	17	56.6
Total	30	100

From Table 4.10, 17 (56.6) of the cooks/caterers indicated they do not store leftover foods, whilst 13 (43.4) alluded that they store leftover food after cooking.

Table 4.11: If yes, where do you store the left over foods?

Responds	Frequency	Percent
In a refrigerator	13	43.7
It is left in a kitchen and heat the following day	17	56.3

Total	**30**	**100.0**

Table 4.11 did indicate that 43.7% of the respondents stored the leftover foods in a refrigerator with the remaining indicated they put them in a kitchen and re-heat them the following day.

Table 4.12: How do you store raw food items and cooked items in the house and in the school?

Storage	**Frequency**	**Percentage (%)**
Together	11	37.0
Separately	19	63.0
Total	30	100.0

To find out how raw food and cooked items were stored, the caterers/cooks were asked how they store raw food items and cooked items in the house and in the school. Table 4.12 indicates that 11 respondents representing 37% of the total population said they store both raw and cooked food items together and 19 respondents representing 63% of the total population said they store both raw and cooked food items separately.

Table 4.13: Why do store raw food items and cooked items separately?

Storage	**Frequency**	**Percentage (%)**
To ensure maintenance of flavor in food.	7	23.0
To stop bacteria transfer and infestation.	23	77.0
Total	**30**	**100.0**

From Table 4.13, 7 (23.0%) of the respondents posit that they ensure maintenance of flavour in food and 23 (77.0%) of them also indicated that they stopped bacteria transfer and infestation in cooking.

Table 4.14: Which method do you use for cooking food?

Method	Frequency	Percentage (%)
Frying	0	0.0
Grilling	0	0.0
Baking	0	0.0
Roasting	0	0.0
Boiling	30	100.0
Total	**30**	**100.0**

From Table 4.14 above the respondents declined not using Frying, grilling, baking, roasting methods in cooking but all thirty (30) respondents said they used boiling method to cook food.

Table 4.15: Do you use menu guide for cooking?

Menu Guide	Frequency	Percentage (%)
Yes	25	83.0
No	5	17.0
Total	**30**	**100.0**

From Table 4.15, 25 representing (80.0) of the respondents alluded that they use menu guide for their cooking while 5 (17.0) postulate that they do not use menu guide for their cooking activities.

Table 4.16: If yes, who provides it?

Method	Frequency	Percentage (%)

District Assembly	19	63.4
Head teachers/teachers	1	3.3
PTA	3	10.0
Caterer	7	23.3
Total	**25**	**100.0**

From table 4.16 the 56% of the respondents said district assembly provided the menu guide, 4% confirmed that head teacher/teacher served them with menu guide for cooking, while 12% were with the view that PTA furnished them with menu guide. Also 28% respondents attested that caterers provided them with menu guide for their daily activities.

Table 4.17: How do you hold/keep prepared dishes before serving?

Method	Frequency	Percentage (%)
In a food warmer	11	37.0
In clean bowls	19	63.0
Total	**30**	**100.0**

From Table 4.17, 11 of the respondents (37%) alluded that they served the prepared dishes in a food warmer, while 63% of the caterers/cooks said they kept the prepared dishes in clean bowls before serving.

Table 4.18: How often do you touch food with bare hands?

Method	Frequency	Percentage (%)
Always	9	30.0
Sometimes	14	47.0
Not at all	7	23.0
Total	**30**	**100.0**

Table 4.18, shows that 30.0% of the respondents said they always touch the food with bare hands, 47% were with the view that they sometimes touch the food with bare hands, but 23% of the respondents confirmed that they do not use their hands to touch the food.

Table 4.19: When do you clean the equipment for cooking and serving?

Method	Frequency	Percentage (%)
Immediately after use	25	83.0
After the day's work	5	17.0
Total	**30**	**100.0**

From Table 4.19, 83% of the respondents were with view that they clean the equipment soon after cooking and serving, but 17% said they clean the equipment after the day's work.

Table 4.20: How do you clean the equipment?

Method	Frequency	Percentage (%)
Wipe with napkin	13	43.0
Wash with soap under running water	5	17.0
Wash with soap and water in a bowl	12	40.0
Total	**30**	**100.0**

From Table 4.20, 43% of the respondents indicated that they wipe the equipment with napkin, 17.0% of the respondents also posit that they wash the equipment with soap under running water. Whilst 40% of caterers and cooks affirmed that they wash the equipment with soap and water in a bowl.

Table 4.21: How do you get water for cooking food?

Source	Frequency	Percentage (%)
Reservoirs/tank	5	17.0
Well	3	10.0
Pipe	15	50.0
Borehole	7	23.0
Total	**30**	**100.0**

Table 4.21 presented how respondents used to get water for cooking food under school feeding programme. Out of the 30 respondents, 17.0% of the caterers and cooks posit that they had water from reservoirs/tanks for cooking. The remaining 10%, 50%, 23.0% had water from well, pipe and borehole respectively for their cooking activities.

Table 4.22: How do you dispose of refuse?

Source	Frequency	Percentage (%)
In a dustbin	07	23.3
At the school's refuse dump	15	50.0
In the school garden	04	13.3
Burry it	01	03.4
Burn it	03	10.0

Total	**30**	**100.0**

Concerning how refuse is disposed after cooking and serving of meals, 23.3% said they dispose rubbish into a dustbin, 50.0% said they dispose rubbish at the school's refuse dump, 13.3% said they dispose rubbish in the school garden, 3.4% said they burry it and 10,0% said they burn it.

Table 4.23: Summary of Observation of Caterers/Cooks

Item	Yes		No	
	F	%	F	%
Caterers/cooks used a container with a cover for storing water	20	67	10	33
Caterers/cooks used washing powder or liquid soap to wash dishes	22	73	08	27
Caterers/cooks used waste bins with cover	23	77	07	23

Caterers/cooks wore apron and hair covering	18	60	12	40
Caterers/cooks kept clean environment	22	73	08	27
Caterers/cooks observed proper solid and liquid waste disposal	13	43	17	57
Caterers/cooks used plastic table cloth	08	27	22	73
Caterers/cooks used cooking pot lids	17	57	13	43
Caterers/cooks used clean hand drying towels	19	63	11	37
Caterers/cooks washed their hands under running water	11	37	19	63
Caterers/cooks observed correct ways of tasting food when cooking	14	47	16	53
Caterers/cooks used easy to clean work surfaces	0	0	30	100
Caterers/cooks washed utensils in hot and cold water	0	0	30	100
Caterers/cooks provided customer with hot water for hand washing	13	43	17	57
Caterers/cooks stored food properly after cooking	14	47	16	53
Caterers/cooks checked for the correct temperature of food for serving	22	73	08	27
Caterers/cooks ensured the availability of portable water at the food vending sites	25	83	05	17
Caterers/cooks used separate equipment and work surfaces for raw and cooked food	08	27	22	73
Caterers/cooks kept work surfaces clean	18	60	12	40
Caterers/cooks washed their hands frequently	22	73	08	27
Caterers/cooks used utensils for serving food	10	33	20	67
Caterers/cooks checked for the equipment and tools that are rusted, cracked, or chipped	14	47	16	53
Caterers/cooks discarded water for washing utensils frequently	28	93	02	07

From Table 4.23, it was observed that 67% of the caterers/cooks used containers with covers to store water used in food preparation. The remaining 33% had containers but without covers which exposed the water to contaminants. Majority of the caterers/cooks representing 27% used washing powder or liquid soap while 8 used cake soap. Furthermore, 77% were in possession of covered dustbins had registered with the Zoom Lion Ghana Limited. However, 23% had dustbins but

without covers. It was observed that 60% of the caterers/cooks wore apron and hair covering during preparation and sale of food whilst the remaining 40% did not wear any aprons and hair coverings. Most of the caterers/cooks representing 73% of the respondents kept their environment clean with 27% not meeting the researcher's expectation of clean environment. The researcher observed how both solid and liquid wastes were disposed of at the cooking sites. 43% of the caterers did not dispose waste properly with 57% disposing theirs properly. Majority of the caterers/cooks, 73% did not use plastic table cloth but 27% used plastic Table cloth. Of the 30 caterers/cooks involved in the study, 57% covered their cooking pots with fitting lids when preparing food whereas 43% did not cover the cooking pots when cooking. On account of availability of hand drying towels, 63% of the caterers/cooks provided clean hand drying towels but 37% provided towels that were not sufficiently clean. Concerning the washing of hands, 37% out of the 30 caterers/cooks washed their hands under running water. It was observed that 47% of the caterers/cooks tasted food the right way with 53% not tasting food properly. Out of the 30 caterers/cooks, none used easy cleanable surfaces. It was observed that, none of the caterers/cooks used hot and cold water to wash utensils. The same was also observed with the provision of hot water that it was not provided for school children to wash their hands before eating.

A few of the caterers/cooks representing 47% stored cooked food properly but 16 did otherwise. It was observed that 73% served cooked food while it was hot and the remaining 8 served food that was not hot. The caterers/cooks who used portable water was 83% but 17% did not have access to portable water in their operations. Furthermore, only 27% of the caterers/cooks used separate equipment and work surface for both raw and cooked food with 73% of them using the same equipment and surfaces for both raw and cooked food. 60% of the caterers/cooks kept work

surface clean while cooking but 40% did not keep clean work surfaces. With regard to frequent hand washing by caterers/cooks during food preparation and services, 73% of the caterers/cooks washed their hands frequently while 8 did not. Again, the table revealed that 27% used appropriate utensils when serving cooked food whereas 67% did not. 14 of the caterers/cooks used equipment and tools that were chipped or rusted but 53% did not use equipment and tools that were rusted, cracked or chipped. However, with regards to frequent discarding of water for washing utensils, 93% of the caterers/cooks discarded water for washing utensils frequently, only 7% of the caterers/cooks did not discard their water often.

4.5 To what extent are meals prepared nutritionally adequate?

The main focus of this section is to ascertain whether meals prepared are nutritionally adequate. The above theme was used in order to answer **Research Question 4:**

To what extent are meals prepared nutritionally adequate?

Responding to research question 4, the researcher posed a number of questions to respondents. The responses provided by the caterers and cooks are presented in Table 4.24 to 4.30.

Table 4. 24: Do you have knowledge about the three functional and six food groups?

Response	Frequency	Percentage (%)
Yes	30	100.0
No	0	0.0
Total	**30**	**100.0**

Table 4.24 ascertained if the respondents knew about the three functional, and six food groups. All the thirty (30) alluded that they have knowledge about the three functional, and six food groups.

Table 4.25: Which of them do you know?

Functional group	Frequency	Percentage (%)
Body building food	13	43.0
Protective food	5	17.0
Energy giving food	12	40.0
Total	**30**	**100.0**

From Table 4.25, 43% of the respondents indicated that they have knowledge about body building food, whilst 17% of them said they are aware of protective food and 40% of the respondents also have knowledge about energy giving food.

Table 4.26: Which food groups fall under each functional food group?

Functional group	Food group	Frequency	Percentage (%)
Body building food	Animal food/products, Legumes and nuts	12	40.0
Protective food	Fruits and Vegetables	08	26.7
Energy giving food	Cereals, Starchy roots/plantain, Fats and Oils	10	33.3
Total		**30**	**100.0**

Concerning the examples of the food groups in the functional food group as shown in Table 4.26, 40% of the caterers/cooks stated that body building consists of animal food/products and legumes and nuts, 26.7% also said protective food group is made up of fruits and vegetables. The remaining 33.3 also knew of cereals, starchy roots/plantain and fats and oils as derived from energy giving foods.

Table 4.27: Do you include all the foodstuff in the various groups in the meals prepared?

Response	Frequency	Percentage (%)
Yes	22	73.3
Not always	08	26.7
No	0	0
Total	**30**	**100.0**

The opinion of caterers/cooks on including all foodstuffs from the various groups in meal preparation as illustrated inferred from Table 4.27 shows that 73.3% include all in their meals. However, 26.7% said they do not include all always whiles none of them said no.

Table 4.28: Why do you include foodstuffs from the various groups?

Reasons	Frequency	Percentage (%)
To build the body/growth	12	40.0
To protect the body	08	26.7
To give energy to the body	10	33.3
Total	**30**	**100.0**

Table 4.28 shows that, the issue on why they include all foodstuffs from the various food groups in their meal preparation, 40% said it builds the body up or helps the body to grow, 26,7% and 33.3% mentioned that it gives protection and energy.

Table 4.29: Has there been an improvement in nutritional related health problem of the school children?

Response	Frequency	Percentage (%)
Yes	30	100.0
No	0	0
Total	**30**	**100.0**

From Table 4.29, it is inferred that all caterers and cooks representing 100% answered in the affirmative concerning the observation of improvement in pupil's nutritional and health status.

Table 4.30: Mention at least one nutritional health related problem that has been solved

Nutritional health problem	Frequency	Percentage (%)
Underweight	08	26.7
Stunted growth	06	20.0
Muscle wasting	06	20.0
Obesity	03	10.0
Anemia	07	23.3
Total	**30**	**100.0**

On the account of nutritional related problems and solution, Table 4.30 revealed that 26.7% of the respondents observed that some of the school children are no more underweight, 20.0% observed that the school children no more have stunted growth but are building up and growing as expected. Another 20.0% realized that muscles are no more wasting, 10% said that obesity has decreased whilst the remaining 23.3% said anemia has decreased.

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.0 Introduction

This section deals with discussion of findings derived from the analysis of data collected in the study. The findings have been discussed within the context of the literature reviewed and in relation with the following research questions.

1. What are the responsibilities of the caterers and cooks?
2. To what extent are caterers aware of the rules governing catering industry?
3. What are personal environment and food hygiene of the caterers/cooks in the School Feeding Program?
4. To what extent are meals prepared nutritionally adequate?

5.1 Discussions of results

The main aim of the study was to ascertain the effectiveness of the Ghanaian School Feeding Programme in Koforidua Municipality. The results of the biographic information which implies that the head teachers and PTA executives played supervisory and monitoring roles affirms the research by Biney (2010) which indicates that decisions are mostly taken by influential citizens of a community who had very good knowledge of the community. This can attest to reasons why most decisions are taken by adult and matured people within the community. However, most of this knowledge comes with years of residence in the community. Owolabi (1993) stated that the quality of knowledge imparted could be inferred from qualification and experience.

The results again indicated that up to date, the only guideline for food procurement under the school feeding programme is that, all foods must be procured from locally-grown (Home-Grown) commodities produced by local farmers, with emphasis on procuring from nearby farmers at community level within ones' district, or sourced within regional markets or at worst, within Ghana. Food procurement is being done by Caterers who are also responsible for cooking and feeding, which is done at the school level using kitchens constructed by the programme or the community, typically known as the Caterer Model.

The primary responsibility of the Ghana School Feeding Programme in procuring at the national level is to abide by all national procurement policies along the entire procurement process, and to ensure that those who receive GSFP funds are also held accountable to these policies. However, there are no established procurement models or procedures that serve as guiding principles for caterers/suppliers of the foods purchased for preparation on the programme.

The United Nations Hunger Task Force (UNHTF) considers school feeding programs as a good combination of education and agriculture. Their point of view is that SFPs could increase school attendance, especially of girls and, furthermore, the implementation can stimulate the market demand for locally produced foods. The UNHTF especially recommends comprehensive community- and school-based feeding programs that include not only school feeding, but also systematic de-worming, micronutrient supplementation, take-home rations, safe cooking facilities, clean drinking water and improved sanitation (UNHTF, 2004).

5.2 Research Question One

What are the responsibilities of the caterers and cooks?

Under this research question, the researcher elicited responses from the caterers and cooks on their responsibilities as far as their involvement in the school feeding programme is concerned. This was done based on various questions.

When this question was asked; *what are your primary responsibilities in the School Feeding Program?* 1 out of the 30 caterers and cooks within the Koforidua Municipality said:

> *"we are responsible for the buying of all the food items we use in the school, and other things we may need. Just that our money keeps delaying and our creditors are always on our necks". "All the things we need for the school feeding we have to either buy or credit them". ''We are responsible for buying all the food and cooking items, sourcing for cooks, some of us even had to look for a place to cook for the children''.*

On the other hand, one of the cook's said; my main responsibility in the school feeding program was that:

> *"we have to follow the menu given to us by our madam for the week, so we make sure we prepare the food we have every day. We use the food items at our disposal and we make sure we prepare the food under hygienic environment as possible as we can". "Our responsibilities as cooks are to prepare the meals we have on the menu"." We ensure that we prepare healthy meals under safe environments".*

However, the literature supports the views of the respondents, catering companies and self-employed caterers have two approaches to menu planning -- customizable menus and set menus. Regardless of the approach, the caterer is responsible for devising a menu. This may include crafting unique recipes and designing plate presentations specifically for a client's event. Caterers must tailor their menus to their brand and catering style. For example, a caterer who offers gourmet BBQ will keep their menu to the traditional BBQ fare, while a caterer who offers French cuisine will design menu items centered on French recipes and preparation methods. Self-employed caterers also handle purchasing and inventory. They must have enough ingredients on hand to carry out menus for events, ensure proper inventory rotation to avoid food waste and manage all food orders.

5.3 Research Question Two

To what extent are caterers aware of the rules governing catering industry?

Responding to the question of whether or not respondents were aware of rules governing the catering industry, all the caterers and cooks responded in the affirmative that they were aware of the rules governing catering industry. When respondents were asked to mention some of the rules they know in governing the catering industry, 32% of the respondents indicated that they were aware that caterers and cooks must acquire the requisite license to qualify them to operate and that they should always operate under hygienic environments. 23% of respondents again said they were aware that they were supposed to seek for permission/license for the place(s) where foods are prepared for the public consumption and the place should be hygienically put together. However, 47% of the respondents indicated that they were aware that places where food items are procured from were supposed to be certified by professional/environmental and sanitation officers to ensure that foodstuff used are hygienic and safe. A similar study conducted by Amponsah *et. al.,* (2011) asserted that the examination on knowledge on food handling and health problems of some food handlers proved that they did not fully understand hazards, their risk and methods of managing such hazards in the preparation and handling of food. WHO (1989) indicated that food handlers have very important role to ensure food safety throughout the chain of food production, processing, storage and preparation. Any disregard for safety including mishandling of food and abuse of hygienic measures on the part of food vendors may cause unpleasant consequences. This shows that if majority of the caterers and cooks are ignorant about certain rules on health issues about their own profession, then consumers are not safe.

5.4 Research Question Three

What are the personal and environmental hygiene of the caterers in the school feeding program?

Inference from Table 4.10 indicated that 43.7% of the respondents stored the leftover foods, 33.2% stored the leftover foods in a refrigerator with the remaining 23.1% indicating that they put them in a kitchen and re-heat them the following day. This postulates that cooling food items in refrigerators, frozen and dry storage are among the methods of food preservation. Cool storage refers to storage at temperatures above freezing point from about 16^0C down to -2^0C while frozen refers to storage at temperatures -18^0C or below to maintain food (Fosket & Ceserani, 2007). Most disease causing bacteria can grow within a temperature range of 5^0C to 60^0C, commonly referred to as the food temperature danger zone (McSwane, Rue & Linton, 2000; Frazier & Westhoff, 1988). It is further recommended that all cold foods must be stored at 5^0C or below and all hot foods held at 63^0C or above. Ghana's law requires that storage of food should be under such conditions as shall prevent contamination, including development of pathogenic or oxygenic microorganisms or both (Ghana's Public Health Act, 2012).

From Table 4.12, 23% of the respondents posit that they ensure maintenance of flavour in food and 77% of them also indicated that they stopped bacteria transfer and infestation in cooking. This implies that when cooked foods are kept well, separated from raw food and covered, they reduce the risk of cross-contamination. Also when proper arrangement of items in stores are done and coded/marked, it eases their identification and removal for use.

Table 4.14 indicates that respondents declined the use of frying, grilling, baking and roasting methods in cooking but all thirty (30) respondents said they used boiling as a method to cook food to ensure that micro-organisms that are harmful in food items are destroyed. Proper cooking of potentially hazardous foods destroys harmful micro-organisms that may be present in the food however, different foods and the methods, by which they are cooked, require different end point temperatures to be safe. The range of safe cooking temperatures can vary from 63^0C to 74^0C (McSwane, Rue, & Linton, 2000) but it is recommended that the core temperature of all parts of the food must reach at least 70^0C within a period of 2 hours (Frazier & Westhoff, 1988). Time and temperature of cooking should be sufficient to ensure destruction of non-spore forming pathogenic micro-organisms. However, spores of certain bacteria like *Clostridium botulinum*, *Clostridium perfringens* and *Bacillus cereus* can survive cooking temperatures (Frazier & Westhoff, 1988). This suggests that proper cooking method should be adopted by all cooks and caterers to ensure destruction of pathogenic micro-organisms in food items.

Table 4.15 shows that 83% of the respondents eluded that they use menu guide for their cooking while 17% postulate that they do not use menu guide for their cooking activities. The most enjoyable part of their work, for many caterers, is the time they spend creating menus, dishes and plans for parties, banquets, cocktail hours, weddings and other events. This is where one can create a brand around your unique personality. As a cook or caterer, there is the need to check out the competition to determine what others are selling and what one's target audience is buying. Any caterer is a people person, works with potential clients to create the best menus within

their budgets. If a caterer/cook works for a planner or want to avoid sales, he/she can spend more of your time creating food after contracts are booked.

From Table 4.17, 37% of the respondents alluded that they served the prepared dishes from a food warmer, while 63% of the caterers and cooks said they kept the prepared dishes in clean bowls before serving. Food should be handled, served or sold with clean equipment and utensils that is tongs, forks, spoons or disposable gloves and never handled with bare hands. Utensils/cutlery should be clean and dry and not handled by touching the food contact surfaces (McSwane, Rue, & Linton, 2000) and plates filled with food should not be stacked on top of the other during display, storing or serving. Clean tongs, forks, spoons or disposable gloves should be used when handling street – vended foods. Good personal hygiene should always be practiced when serving food, by wearing a clean uniform and hair restraint and wash hands after handling money and before handling food again (National Board of Experts, The Netherlands, 2002). This posit that, when all these practices are done by caterers and cooks it will promote good healthy eating of food.

Table 4.18 shows that 30% out of the 30 respondents said they always touch the food with bare hands, 14% were with view that they sometimes touch the food with bare hands, but 23% of the respondents confirmed that they do not use their hands to touch the food. Mensah *et.al* (2002) are of the view that many food handlers introduce biological and physical hazards through cross-contamination and mishandling of food. The use of bare hands to serve food increases the level of contamination as entero-pathogens survive on the hands for three hours or longer. Pathogens can be harbored and transmitted on to others by individuals who

themselves are healthy. Such carriers may have recently suffered an attack of food poisoning and still be carriers of the organisms in their body. In some instances, carriers of food pathogens such as salmonella, Typhi and Bacillus cereus acts as a host over a longer period of time as they acquire immunity to the organism concerned. Such individuals might end up transmitting the organisms to other people through food without being aware of it. It is thus important that food handlers are educated on routes and means through which pathogens invade the food they prepare and sell to the public. Addo *et.al.* (2007) intimated that food vendors who prepare and sell food are important factors that contribute significantly to food borne related diseases as they have very little or no educational background and hence have low understanding of food safety issues (Mensah *et.al.,* 1999).

Table 4.16 reveals that 83% of the respondents were with view that they clean the equipment soon after cooking and serving, but 17% said they clean the equipment after the day's work. Washing equipment is crucial in preventing food borne illness from pathogens such as *Norovirus* and *Salmonella*. *Norovirus* can be transmitted from touching ready-to-eat food with hands contaminated with the pathogen. The Centers for Disease Control and Prevention (2010) recommended washing equipment before, during and after food preparation to prevent the spread of *Norovirus*.

From Table 4.20, it is shown that 43% of the respondents indicated that they wipe the equipment with napkin, 17% of the respondents also posit that they wash the equipment with soap under running water. Whilst 40% of caterers and cooks affirmed that they wash the equipment with soap and water in a bowl. A similar study on this section indicated that 40 percent of the food borne illness outbreaks in fresh produce

was caused by poor personal hygiene and improper contact with sewerage. Since most middle school children reported that they helped prepare food (Byrd-Bredbenner, Schaffner, & Mauer Abbot, 2010; Haapala & Probart, 2004), washing food equipment is crucial in preventing food borne illness. A study demonstrated that school children who washed their hands four times daily had 24% fewer absences caused by breathing-related problems and 51% fewer absences caused by stomach cramps, compared to children who did not wash their hands (Master, Longe, & Dickson, 1997).

5.5 Research Question Four

To what extent are meals prepared nutritionally adequate?

The research was intended to find out the nutritional adequacy of food served to school children benefitting from the School Feeding Program. SFPs are said to have 3 major impacts (Bennett, 2003; Hall *et a*l, 2007). The first impact is the improvement of the nutritional status of school-going children and the reduction of malnutrition rates.

With regards to ascertaining if the respondents knew about the three functional and six food groups that can help them prepare nutritious meals, all of them alluded that they have knowledge about the three functional, and six food groups. This shows that all the caterers and the cooks knew functional and six food groups exist, From Table 4.24, 43% of the respondents indicated that they have knowledge about body building food, whilst 17% of them said they are aware of protective food and 40% of the respondents also have knowledge about energy giving food. Even though all the caterers were aware of the various food groups they could not mention all individually. This indicates that caterers/cooks have not had enough education of the

functions of food that can help them combine foodstuff from the various food groups to prepare nutritional adequate food. Improving nutritional status is thought to require a range of interventions, varying from supplementary feeding for mothers and young children to school feeding and other food based strategies (Bennett, 2003; Allen, 2001; Hall *et al*, 2007). This may indicate that school feeding programmes on their own may not be sufficient to improve nutritional status of primary school children.

Concerning the examples of the food groups in the functional food group, 40% of the caterers/cooks stated that body building foods consists of animal foods/products and legumes and nuts, 26.7% also said protective food group is made up of fruits and vegetables. The remaining 33.3% also knew of cereals, starchy roots/plantain and fats and oils as derived from energy giving foods. Therefore, as suggested to Ministry of Food and Agriculture, in planning of balanced diets, Ghanaians foods have been grouped into six classes and all must be taken into consideration when planning a menu for schools and households (MOFA, 2006). The study again sought for the opinion of caterers/cooks on inclusion of all foodstuffs from the various groups in meal preparation, as illustrated inferred from Table 4.27 showed that 73.3% of them included all in their meals. However, 26.7% said they do not include all always whilst none of them said no. On the issue why they include all foodstuffs from the various food groups in their meal preparation, 40% said it builds the body up or helps the body to grow, 26.7% and 33.3% mentioned that it gives protection and energy respectively. From the discussion, it was deduced that not all the caterers use the basic and appropriate ingredients of delivering better nutrition to children. This attest to the fact that the nutritional adequacy of meals provided at school is critical to meeting health and educational objectives. Providing healthy meals in schools require

that continuous assessment be done to ensure nutritional adequacy (Del Rosso, 1999; Murphy *et. al.,* 1995). In addition, the SFPs exist globally by many names basically for the purpose of delivering better nutrition to children. Schools or government then modify or broaden the programmes' nutrition objectives upon identification of specific nutritional deficiencies or problems. While protein-energy malnutrition and micronutrient deficiencies, particularly of iron, iodine, and vitamin A, remain as the dominant problem in many countries, others already have eradicated under-nutrition and addressed obesity and diet-related chronic degenerative diseases (Florencio, 2001).

With reference to respondents seeing any change in the school children concerning their health and development, it was inferred that all caterers/cooks representing 100% answered in the affirmative concerning the observation of improvement in pupil's nutritional and health status. On the account of nutritional related problems and solution, Table 4.29 revealed that 26.7% caterers/cooks observed that some of the school children are no more underweight, 20.0% observed that the school children no more have stunted growth but are building up and growing as expected. Another 20.0% realized that muscles are no more wasting, 10% said that obesity has decreased whilst the remaining 23.3% said anemia has decreased. There is no scientific proof about it as to how the respondents came out with their findings as far as their observation is concerned. This in contrast of the finding made by MOFA that there is a small effect of SFPs on the nutritional status of school children has been demonstrated in a few studies. However, it is not yet clear if the effect on nutritional status can be attributed to the implementation of an SFP. (Ministry of Foods and Agriculture) (MOFA, 2006).

5.6 Summary

This chapter dealt with discussions of data obtained in relation to the research questions of the study. It also specified the analysis of findings based on reviewed literatures on the study.

CHAPTER SIX

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

6.0 Introduction

This chapter focuses on the summary, conclusion and recommendations of the study. The recommendations were made based on the major findings of the study and the conclusions drawn. The chapter also considers the implications of the findings to social policy and practice as well as suggestions for future studies.

The study identified the effectiveness of the Ghanaian School Feeding Programme in Koforidua Municipality. The study was designed to achieve the following objectives:

1 Examine the responsibilities of the caterers/cooks, head teachers and the PTA chairpersons.

2 Assess the level of awareness about rules governing catering industry in Ghana;

3 Ascertain the level of personal and environmental hygiene status of the caterers in the school feeding program; and

4 Assess the nutritional adequacy of the meals prepared.

Based on the research objectives, literature was reviewed in related areas such as the concept of school feeding, school feeding programme in other countries, objectives of the school feeding program, roles and responsibilities of key actors in

GSFP implementation and school feeding as a nutritional intervention strategy among others.

In terms of methodology, a case study and descriptive survey design was adopted for the study and the population consisted of individuals within selected schools as well as the communities in New Juaben Municipality in Koforidua in the Eastern Region. Purposive sampling technique was used to select 60 participants which comprise 30 caterers/cooks, 15 head teachers and 15 PTA chairpersons in each of the fifteen selected school. Interview and observations discussions were the research instruments used as a result of the nature of the study and the sample size selected.

6.1 Summary of Findings

Findings from the study indicated that:

All the caterers/cooks were females and above 30 years and were educated. Most of them had secondary education. Majority of the respondents 21 representing (70%) have had experience in catering industries before. However, 9 (30%) of the respondents have not had any experience with catering industry. Majority of the caterers/cooks, had valid license that permits them to operate as caterers and cooks. It was found the caterers were responsible for the buying of all the food items we use in the school and other things they needed just that their moneies kept delaying and their creditors were always on our necks". They either bought or credit all the things they needed for the school feeding. Also the caterers pay the cooks and some of them even have to look for a place to cook for the children. The main role of the head teacher and PTA Chairpersons is supervision for the caterers/cooks in the entire school feeding programme. The head teachers and PTA Chairpersons assessed caterers/cooks performance in terms of hygiene. Whilst the head teachers assessed performance thrice in a term, the PTA chairpersons did that once every term. In addition, it was realised that the head teachers/PTA Chairpersons sanctioned the caterers/cooks who do not possess licenses as well as perform as expected by first warning them and later report them to the district assembly for failure to comply with what is expected of them.

All the caterers and cooks were aware of the rules governing the catering industry. Notwithstanding the results also indicated that the cooks/caterers had knowledge of

personal and environmental hygiene which has been a worry for most researchers. Majority of the cooks and caterers put on clean cloth or dresses but few of them wear protective clothing. Caterers ensured that the cooks put on clean cloth or dresses and were aware they would be sanctioned for not practicing proper personal hygiene that can cause food infestation. Also undertaken medical checkup and received training on food hygiene and safety are known to caterers/cooks.

Most caterers/cooks washed vegetables and other foodstuff with water and few of them used vinegar to treat vegetables before using them. Majority of caterers stored their left over foods in their kitchen and heat the next day whereas the remaining kept it in a refrigerator. For maintenance of flavor and bacteria transfer and infestation, most of the caterers stored their raw and cooked foods separately. Majority of the caterers did not serve the food they cook hot and also most of them touched the food with bear hands. Majority of the caterers/cooks, 25 clean the equipment for cooking and serving immediately after the day's work. Hot water was not provided for washing of hands and for washing utensils. Pipe borne water does not flow most of the time at cooking sites and containers used for storing water are not covered by majority of the respondents. Majority of food caterers/cooks did not wash hands frequently and hands were not washed under running tap water with liquid soap or detergents. Solid waste was not properly disposed well in the cooking sites which attracted flies to the place.

Nutritional and health benefits from the program are that the children do not eat lunch anymore in the home, which saves the parents money and time, the farmers in the New Juaben Municipality are able to sell some of their foods (palm oil, yams, fish) to the caterers/cooks in the programme. All the caterers and cooks had knowledge about the functional and the six food groups and included foodstuffs from at least one of the

groups in the food they cook. Caterers/cooks even though prepare meals for school children alright but not all of them are conversant with all the food groups. All the caterers confirmed they had seen changes in the school children concerning their health and development.

6.2 Conclusions

The study found out that caterers/cooks main responsibilities in the SFP are to buy, cook and serve one hot hygienic and nutritious meals to school children every day and the head teachers as well as the PTA Chairpersons mainly supervise the activities of the caterers. All the caterers/cooks were aware of the rules governing the catering industry. Majority of the respondents, 21 representing (70%) have had experience in catering industries before and had valid licenses that permits them to operate as caterers and cooks. Notwithstanding, the results also indicated that the cooks/caterers had knowledge of personal, food and environmental hygiene which has been a worry for most researchers. Not all cooks and caterers practice it as expected in the catering industry. All the caterers/cooks had knowledge on the functional and the six food groups and confirmed they had seen changes in the school children concerning their health development.

6.3 Recommendations

The study recommends that, based on the sensitization exercises and the education that went on, the key actors in the programme should consider the

following recommendations very important for the improvement of Health and Hygiene service in the GSFP schools and communities:

- GSFP National Secretariat, District Assemblies and other actors should take the medical examination of caterers and cooks seriously and should be a pre-requisite requirement to becoming a caterer or a cook. Vaccination should be given as a preventive measure.
- The District Assemblies should localize all menus so that foodstuff abundantly cultivated and available in the area will be sourced economically. Admittedly some foodstuff would be sourced in bulk at the national or district levels which are fresh from farms and contain nutrients needed.
- The School Implementation Committee (SIC) should ensure that food prepared are nutritionally adequate by ensuring that foodstuffs used for preparing meals are taken from the six food groups to satisfy the functions of food. This can be done by providing oversight and direct supervision of appointed caterers/matrons entrusted with cooking and feeding.
- Given the important role caterers play in society, l recommends that key actors in the Ghana School Feeding program give periodic education on the importance of applying best hygiene practices in food preparation and handling to caterers/cooks involved and insist on the right thing to be done.
- There should be efficient inspection of kitchens of caterers/cooks and how food is dispensed to people are key areas that inspectors of the District Implementation Committee (DIC) of the program should look out for.
- Refresher programmes should be put in place every year to update caterers and cooks' skills on Health and Hygiene practices. Such programmes should be

led by the National Secretariat of GSFP in collaboration with other stakeholders.

- There should be strong synergy among Community Supervisory Officers such as the head teachers, PTA chairpersons and the government in the provision of services such as health, hygiene, water and sanitation facilities and other important complementary services to ensure that food provided are hygienic and nutritional adequate.

6.4 Suggestions for Further Studies

The following has been suggested for further studies;

1. Food fortification should be done more importantly and should be incorporated in the annual activities of GSFP.
2. Food Composition Tables or ESHA Food Processor should be used as a guide in the District Operational Manual to estimate the nutritional adequacy or quality of meals prepared in the GSFP.

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APPENDIX A

INTERVIEW GUIDE

Section A: Demographic Data

a. Sex

b. Age

c. Educational Background

Section B: Responsibility of Caterers

a. What is your main responsibility as a caterer in the school feeding program?

b. How do you procure or buy your items?

c. Do you caterers and cooks follow the procurement process?

d. Do you have well established procurement models for procuring your goods?

e. Do you have any experience in the catering industry?

Section C. Awareness of Rules in the Catering Industry

a. Are you aware of the rules and regulations governing the catering industry?

b. Do you have any knowledge on rules in the catering industry?

c. Do you have valid license that permits you to operate as caterers/cooks?

Section D. Personal, Environmental and Food Hygiene Status

a. What are the personal and environmental hygiene of the caterers in the school feeding program?

b. Do cooks and caterers put on clean cloth or dresses?

c. Have you undertaken any medical checkup?

d. Do you ensure cooks put on clean cloth or dresses?

e. Do you sanction them for not practicing proper personal hygiene that can cause food infestation?

f. Have you received any training in food hygiene and safety?

g. Where did you receive the training?

h. Do you treat foodstuffs (vegetables from the market) before using?

i. Do you store leftover food after cooking and serving?

j. If your answer is yes, where do you store the left over foods?

k. How do you store raw food items and cooked items in the house and in the school?

l. If stored separately, why?

m. Which method do you use for cooking food?

n. Do you use menu guide for cooking?

o. If yes, who provides it?

p. How do you hold prepared dishes before serving?

q. How often do you touch food with bare hands?

r. When do you clean the equipment for cooking and serving?

s. How do you clean the equipment?

t. How do you get water for cooking food?

u. How do you dispose of refuse after cooking and serving meals?

Section E. Nutritional Adequacy of Meals

a. Are meals prepared nutritionally adequate?

b. Do you have knowledge about the three functional, and six food groups?

c. Which of them do you know?

d. Which food groups fall under each functional food group?

e. Do you include all the foodstuff in the various groups in the meals prepared?

f. Why do you include foodstuffs from the various groups?

g. Has there been an improvement in nutritional related health problem of the school children?

h. Mention at least one nutritional health related problem that has been solved

i. In which ways are the food cooked of good quality?

Questions for Head teachers and P.T.A Chairmen

a. What is your educational background?

b. What are your roles in the school feeding program?

c. Do you check their license before they are allowed to work?

d. How often do you assess are their performance?

e. Do you sanction them for lack of performing as expected?

f. What are the sanctions?

APPENDIX B

QUESTIONNAIRE

DEPARTMENT OF HOME ECONOMICS

UNIVERSITY OF EDUCATION, WINNEBA

TOPIC-HYGIENIC PRACTICES OF CATERERS/COOKS OPERATING IN THE GHANAIAN SCHOOL FEEDING PROGRAMME IN KOFORIDUA MUNICIPALITY

Dear Respondent,

I am conducting a study on Hygienic practices of caterers/cooks operating in the Ghanaian School Feeding Programme in Koforidua Municipality. This is in partial fulfillment of the requirements of the award of Master of Philosophy degree in Home Economics. I would be very grateful if you could respond to the questionnaire. You are sincerely assured of high confidentiality for any information provided. Thank you.

Questions for caterers/cooks

Section A: Demographic Data

1. Sex?

   a) Male

   b) Female

2. Age?

   a) 30-39

   b) 40-49

   c) 50 and above

3. Educational Background?

   a) Basic Education

   b) Secondary Education

   c) Tertiary Education

Section B: Responsibility of Caterers

1. What is your main responsibility as a caterer in the school feeding program?

   ……

2. How do you procure or buy your items?

   ……

3. Do you caterers and cooks follow the procurement process?

   ……

4. Do you have well established procurement models for procuring your goods?

   ……

5. Do you have any experience in the catering industry?

   a) Yes

   b) No

Section C. Awareness of Rules in the Catering Industry

1. Are you aware of the rules and regulations governing the catering industry?

a) Yes

b) No

2. Do you have any knowledge on rules in the catering industry?

a) Yes

b) No

3. Do you have valid license that permits you to operate as caterers/cooks?

a) Yes

b) No

Section D. Personal, Environmental and Food Hygiene Status -What are the personal and environmental hygiene of the caterers in the school feeding program?

1) Do cooks and caterers put on clean cloth or dresses?

a) Yes

b) No

2) Do you wear protective clothing?

a) Yes

b) No

3) Do caterers ensure that cooks put on clean cloth or dresses?

a) Yes

b) No

4) Are you sanction for not practicing proper personal hygiene that can cause food infestation?

a) Yes

b) No

5) Have you undertaken any medical checkup?

a) Yes

b) No

6) . Have you received any training in food hygiene and safety?

a) Yes

b) No

7) Where did you receive the training?

a) From home (from mother)

b) From formal training (vocational school)

c) From health professional/environmental and sanitation officers

8) Do you treat foodstuffs (vegetables from the market) before using?

a) I wash them with water

b) I use vinegar to wash them

9) Do you store leftover food after cooking and serving?

a) Yes

b) No

10) If your answer is yes, where do you store the left over foods?

a) In a refrigerator

b) It is put in the kitchen and heated the next day

11) How do you store raw food items and cooked items in the house and in the school?

a) Together

b) Separately

12) If stored separately, why?

a) To ensure maintenance of flavor in food

b) To stop bacteria transfer

13) Which method do you use for cooking food?

a) Frying

b) Grilling

c) Baking

d) Roasting

e) Boiling

14) Do you use menu guide for cooking?

a) Yes

b) No

15) If yes, who provides it?

a) District Assembly

b) Head teachers/teachers

c) PTA

d) Caterer

16) How do you hold/keep prepared dishes before serving?

a) In a food warmer

b) In clean bowls

17) How often do you touch food with bare hands?

a) Always

b) Sometimes

c) Not at all

18) When do you clean the equipment for cooking and serving?

a) Immediately after use

b) After the day's work

19) How do you clean the equipment?

a) Wipe with napkin

b) Wash with soap under running water

c) Wash with soap and water in a bowl

20) How do you get water for cooking food?

a) Reservoir/tank

b) Well

c) Pipe

d) Borehole

21) How do you dispose of refuse after cooking and serving meals?

a) In a dustbin

b) At school's refuse dump

c) In the school garden

d) Burry it

e) Burn it

Section E. Nutritional Adequacy of Meals

1) Are meals prepared nutritionally adequate?

……..

2) Do you have knowledge about the three functional, and six food groups?

a) Yes

b) No

3) Which of them do you know?

a) Body building food

b) Protective food

c) Energy giving food

4) Which food groups fall under each functional food group?

a) Body building foods: …….

b) Protective: ……

c) Energy giving food: ……

5) Do you include all the foodstuff in the various groups in the meals prepared?

a) Yes

b) Not always

c) No

6) Why do you include foodstuffs from the various groups?

a) To build the body/growth

b) To protect the body

c) To give energy to the body

7) Has there been an improvement in nutritional related health problem of the school children?

a) Yes

b) No

8) Mention at least one nutritional health related problem that has been solved

a) Underweight

b) Stunted growth

c) Obesity

d) Anemia

APPENDIX B I

QUESTIONNAIRE

DEPARTMENT OF HOME ECONOMICS

UNIVERSITY OF EDUCATION, WINNEBA

TOPIC-HYGIENIC PRACTICES OF CATERERS/COOKS OPERATING IN THE GHANAIAN SCHOOL FEEDING PROGRAMME IN KOFORIDUA MUNICIPALITY

Dear Respondent,

I am conducting a study on Hygienic practices of caterers/cooks operating in the Ghanaian School Feeding Programme in Koforidua Municipality. This is in partial fulfillment of the requirements of the award of Master of Philosophy degree in Home Economics. I would be very grateful if you could respond to the questionnaire. You are sincerely assured of high confidentiality for any information provided. Thank you.

Questions for Head teachers and P.T.A Chairmen

a. What is your educational background?.....

b. What are your roles in the school feeding program?.....

c. Do you check their license before they are allowed to work?

   i. Yes

ii No

d. How often do you assess are their performance……

e. Do you sanction them for lack of performing as expected?

i Yes

ii No

f. What are the sanctions? …….....

APPENDIX C

EFFECTIVES OF HYGIENIC CONDITIONS OF GHANA SCHOOL FEEDING PROGRAMME IN SOME SELECTED SCHOOL IN THE NEW JUABEN MUNICIPALITY

OBSERVATIONAL CHECKLIST OF CATERERS/COOKS

THINGS OBSERVED	YES	NO
A container with a cover for storing water, bowls, forks for washing dishes and utensils		
Washing powder or liquid, soap to wash dishes		
Dustbins with cover		
Apron		
Plastic table cloth		
Cooking pots with lids		
Clean hand drying towels		
Broom and mops		
Proper solid waste disposal		
Correct tasting of food when cooking		
Easy cleanable working surface		
Utensils washed in hot and cold water		
Hot water for hand washing		
Proper storage of food before cooking		

Proper storage of food after cooking		
Correct temperature of food		
Safe water		
Toilet facility		
Present of pest and rodents		
Frequent washing of hands		
Utensils used for serving		
Equipment and tools are rusted, cracked and chipped		
Frequent discarding of water for washing		

APPENDIX D

LETTER FOR SEEKING PERMISSION FROM THE FRONT DESK OFFICER IN CHARGE OF SCHOOL FEEDING PROGRAM AT THE DISTRICT ASSEMBLY IN THE NEW JUABEN MUNICIPALITY

S.D.A College of Education
P. O. Box 18
Asokore- Koforidua.
5th April 2017

The Municipal Chief Executive
District Assembly
New Juaben Municipality
Koforidua.

Dear Sir/Madam,

PERMISSION LETTER

Am a tutor in the above school and pursuing an MPhil program in Home Economics at the University of Education, Winneba. I'm writing my thesis on the Effectiveness of the Ghanaian School Feeding Program in some selected schools in Koforidua Municipality in the Eastern Region of Ghana.

I will be very grateful if you could grant me a permission letter to enable me have access to the caterers and cooks in the municipality to solicit for some information as far as my program is concerned. Attached is a list of the selected schools.

Counting on your usual co-operation.

Thank You.

Yours Faithfully,

……..

Patience Owusua Annoh

SELECTED SCHOOL IN THE MUNICIPALITY

1. **APIMPOA ISLAMIC PRIMARY**
2. **KOFORIDUA KHALID IBN WALID ISLAMIC PRIMARY**
3. **BORNYA KING OF GLORY PRESBY BASIC SCHOOL**
4. **TROM NYEREDE M/A PRIMARY**
5. **KORLE NKWANTA GOOD SHERPERD PRIMARY**
6. **AKWADUM METHODIST BASIC SCHOOL**
7. **AKWADUM ISLAMIC PRIMARY**
8. **AKWADUM M/A METHODIST BASIC SCHOOL**
9. **ASOKORE METHODIST PRIMARY**
10. **ASOKORE SALVATION PRIMARY**
11. **EFFIDUASE R/C PRIMARY**
12. **JUMAPO PRESBY BASIC SCHOOL**
13. **JUMAPO ST. STEPHEN'S PRIMARY**
14. **OYOKO METHODIST PRIMARY**
15. **OYOKO PRESBY BASIC SCHOOL.**