

**UNIVERSITY OF EDUCATION, WINNEBA  
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DEPARTMENT OF CATERING AND HOSPITALITY**

**THE MEALS PREPARATION PATTERN OF BOARDING SCHOOLS AND ITS  
IMPACTS ON THE HEALTH STATUS ON STUDENTS: A CASE STUDY ON  
ZABZUGU SENIOR HIGH SCHOOL**



**A DISSERTATION IN THE DEPARTMENT OF CATERING AND HOSPITALITY,  
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## DECLARATION

### A. STUDENT'S DECLARATION

I, ORMORH ESTHER, declare that this dissertation, with the exception of quotations and references contained in published works which have all been identified and acknowledged, is entirely my own original work, and it has not been submitted, either in part or whole for another degree elsewhere.

Signature ..... Date .....

### B. SUPERVISOR'S DECLARATION

I declare that this dissertation was written under my supervision and that the candidate has been consistent in his interaction with me for guidance and directions.

.....  
(Date)

**MRS OLLU ELLEN**

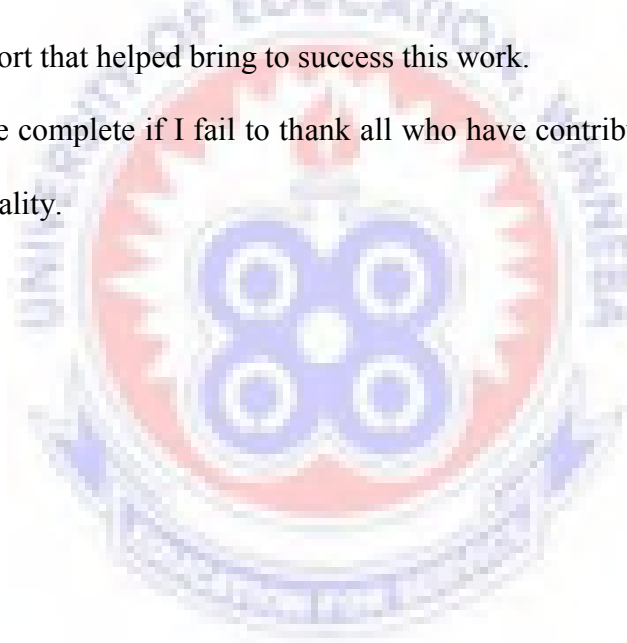
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## **DEDICATION**

This work is dedicated to Mr. ESK Afari, my beloved husband for enduring my absence from home during the period of my study. I also dedicate this work to little boy, Selikem Benedict Afari not forgetting other members of the family especially my mother-in-law Veronica Wukpo, Esther Afari, Joshua, David. This dedication equally extends in a special way to my parents Iddrisu Ormorh and Salamata Ormorh.



## TABLE OF CONTENTS

<b>Contents</b>	<b>Page</b>
Declaration	ii
Acknowledgement	iii
Dedication	iv
Table of contents	v
List of Tables	viii
Abstract	ix
<b>CHAPTER ONE</b>	
1.0 Introduction	1
1.1 Background to the Study	1
1.2 Statement of the problem	1
1.3 Objective of the study	3
1.4 Research Questions	6
1.5 Purpose of the study	6
1.6 Significance of the Study	7
1.7 Delimitation of the Study	7
1.8 Limitation	7
1.9 Organisation of the Study	8
1.10 Definition of Terms	9
<b>CHAPTER TWO</b>	
Literature Review and Theoretical Framework	10
2.0 Introduction	10
2.1 Types of Meal Prepared for SHS Students in West Africa	10
2.1.1 Meals provided for SHS students in Ghana	13

2.2 Meal Preparation Patterns in SHS	15
2.2.1 Hygienic Practices on Food Preparation in boarding schools	16
2.2.2 Cooks' Knowledge on Menu and Food Preparation Skills	17
2.3 Relationship between Meals and Health Status of Students	18
2.4 Theoretical Framework	22
2.4.1 Health Belief Model	23
<b>CHAPTER THREE</b>	
3.0 Methodology	29
3.1 Research Design	29
3.2 Population and Sampling Procedure	30
3.2.1 Population	30
3.2.2 Sample	30
3.2.3 Sampling Technique	30
3.3 Research Instruments	31
3.4 Data Collection Procedure	32
3.5 Data Analyses Procedure	32
<b>CHAPTER FOUR</b>	
Analysis of Data and Discussion of Findings	
4.0 Introduction	34
4.1 Demographic Characteristics of Respondents	34
4.2 Discussions, Interpretation, and Analysis of Research Data	35
Research Question One	36
Research Question Two	43
Research Question Three	49

**CHAPTER FIVE**

Summary of Findings, Conclusions, Recommendations and Suggestions for Further Research

5.0 Introduction	54
5.1 Summary of Findings	54
5.2 Conclusions	55
5.4 Recommendations	56
5.5 Suggestions for future Research	57
<b>REFERENCES</b>	59
APPENDIX A	66
APPENDIX B	68
APPENDIX C	69



### List of Tables

<b>Table</b>	<b>Page</b>
Table 4.1 Distribution of Respondents by Sex	34
Table 4.2 Respondents' year group	35
Table 4.3 Breakfast meals provided to students of Zabzugu SHS	37
Table 4.4 Lunch meals provided to students of Zabzugu SHS	38
Table 4.5 Supper meals provided to students of Zabzugu SHS	39
Table 4.6 Meals preference among students of Zabzugu SHS	40
Table 4.7 Meals preference among students of Zabzugu SHS	41
Table 4.8 Meals preference among students of Zabzugu SHS	42
Table 4.9 Cooks hygienic practice at school's kitchen	47
Table 4.10 Students' state of health after consuming dining hall food	50



## **ABSTRACT**

This study was conducted with the objectives of assessing the kind of meals provided for boarding students in Senior High Schools in Ghana; examining meal preparation patterns and the hygienic practices in the school's kitchen and assessing the relationship between meals and the health status of students. The main aim was to provide baseline data on the pertaining food safety practices in boarding schools in Ghana for future improvements.

The research covered all the three year groups of the school but was centered more on the third year students because of their experience and academic maturity. The study utilized a simple random stratified sampling, to select 100 students (40 girls and 60 boys) and 12 school authorities including 5 assistant cooks and 1 matron and six (6) other members of staff, comprising the management, teaching staff, storekeeper and the bursar.

The first objective which sought to assess the kind of meals provided for boarding students in Senior High Schools in Ghana. It was revealed that the majority of the students were happy with a number of the meals provided them. However, some breakfast meals were identified as being too light to be taken without any pastry. The study identified that daily three-square meals provided were prepared under fairly good hygienic environment and condition and those meals were served at regular intervals. The study however identified cooks' occasional negligence on some basic hygienic practices such as how to avoid wiping sweat with napkins, regular hands washing. The researcher, in view of the findings concluded that students were generally safe from foodborne diseases while in school.

The researcher therefore recommends that regular and effective in service training for the kitchen staff be organize on food safety practices.

## CHAPTER ONE

### INTRODUCTION

#### 1.1 BACKGROUND

The old age adage which states that “you are what you eat” has come to us through quite a tortuous route to serve the purpose it was intended to. This quote was first derived from Anthelme Brillat-Savarin, (1842), which translates: “Tell me what you eat and I will tell you what you are.” Interestingly, renowned nutritionists such as Victor Lindlahr’s claim that food controls health became popular in the English language in the 1920’s and 1930’s.

This assertion still holds even up to date as everybody is more conscious about the food we consume. In the light of this, one wonders how the foods he takes, especially those taken outside home are prepared. According to W.H.O, (2002), approximately 2.2 million deaths caused by diarrheal disease are recorded annually worldwide and most of these cases are attributed to contaminated food and water.

Several studies associated diseases to food which is a worrying trend that demands serious attention from all and sundry. For instance, the widely criticized US survey, led by Harvard School of Public Health in Boston, indicated that “Higher red meat intake in early adulthood may be a risk factor for breast cancer” (ghanaweb.com, 15 June, 2014).

Contrary to the famous but dangerous cliché which comes in different forms such as “African germs are friendly”, “African germs don’t kill”, “African germs are not harmful” the researcher is of the view that it is prudent that we become conscious of the conditions under which our meals are prepared. This is because minimizing the consumption of unsafe food, may help to ensure the good health of the population and may play a vital role in the economic progress of developing countries. (Saba *et al*, 2012).

There is a multitude of reportage in the Ghanaian media on food poisoning in senior high school. For instance, food poisoning at Awudome SHS (GNA, June 1, 2014); Daboase SHS food poisoning, samples for test (GNA, February 2, 2014); 40 students hospitalized for food poisoning (Abdul Karim Naatogmah/citifmonline.com, march 4,2013).

The students who consume these meals have little control in the preparation process. Though there is a provision for some students with peculiar health problems; termed “special diet”, it is not certain that the meals are prepared under hygienic conditions.

Saba *et al*, (2012) indicated that man through various evolutions has always made efforts to avoid diseases and find ways to cure existing ones in order to improve and prolong life. Undoubtedly the multitude of reportage on foodborne diseases cited above, reveals that we are confronted day in day out with diseases especially those caused by our daily intake of food through cross contamination, improper handling and inadequate heat treatment of food as well as activities such as unhygienic practices; continue to be a threat to human health and life.

Ghana being a lower middle income country is trying to fund all existent developmental projects, including Northern free education programme. Delays of funding which lead to difficulty in getting access to food stuffs in the right proportion, constrain the school authorities sometimes not to be able to offer the best of food service due the students in North. Despite this worrying trend of affaires, students are fed anyway in the Senior High Schools which have boarding facilities in the North.

Northern Ghana has been tagged to be the most deprived part of the country hence, in the wisdom of Ghana’s first President, Kwame Nkrumah; a fund is allocated for subsidizing the education of people at the North. This beautiful idea, unfortunately, has been met with the inability of various governments to release, on time, the needed funds to run schools in North.

Truly, as said by an American nutritionist Dayle Hayes, (2014), school meals are a complicated, nuanced issue, one that does not benefit from polarizing tweets and political rhetoric. He further revealed that in their part of the world, very often the quality of school breakfast, lunch, supper and snack far exceeds what they are fed at home or choose for themselves out in the world. But frankly, I dare say, that is the direct opposite in Ghana. Meals served students in Ghana barely satisfy them not to talk about snacks which are not provided at all.

Many schools at the North could not reopen for weeks due to the delay in releasing the feeding grants which sometimes remain in arrears for a whole academic year. Creditors to the Northern schools sometimes refuse to further supply on credit to the schools because they are uncertain when their monies could be paid back to them which will enable them to remain in business.

At the mercy of the governments, the heads of these schools manage their ways out to feed the students in order to keep the schools running. Obviously, this comes with a lot excuses from the heads for providing available meals instead of strictly following the menu planned for the schools.

With this background, the researcher deems it necessary to turn the attention to a school under the said condition to ascertain the meal preparation pattern in the boarding house and its consequent impacts on the health of the students.

## **1.2 STATEMENT OF THE PROBLEMS**

The significant and rising importance of food consumption away from home has drawn the need to understand better the extent to which food eaten influences students' health and studies in boarding houses. In this regard, thousands of dedicated, hardworking school cooks and matrons do their best every day to serve the healthiest meals possible. As the upbringing of children especially adolescents is a shared responsibility of parents, teachers, the

government and the general public, interest ought to be shown in the meals that are provided to students in the boarding houses. Paying school fees and providing the necessary logistics for students is just not enough to make students comfortable and healthy at school. So, there is the need for critical attention on the preparation pattern of food that is served to students who are surely our future leaders.

The Ghana government's policy of providing free education for students in the North is currently posing a lot of challenges for school administrators in terms of smooth running of schools due to delays in the release of feeding grants. Therefore, as school authorities and other stakeholders try to put in their best in sustaining the schools, it behooves on all well-meaning Ghanaians to take keen interest in finding out a number of issues regarding the meals served in boarding houses in the North. Amongst these issues include the kind of menu that is followed in the school kitchens and to the extent to which matrons adhere to the planned menu.

Beside the meal itself, we need to put an eagle eye on the storage, cooking and eating environment at the various schools. This can assure all and sundry of the general hygienic practices employed in the schools. In monitoring the trend of meal preparation patterns in our boarding schools, we need to examine the calibre of people who are employed to do the cooking as well as their level of knowledge in hygiene as a whole and food hygiene in particular. This will go a long way to assuring parents who worry ceaselessly about the wellbeing of their cherish wards. As most of the cooks employed at the school's kitchens have relatively lower level of formal education, there is the need to ascertain their awareness and practice of personal hygiene as well as kitchen hygiene. Though cooks work directly under the supervision of matrons, their level of personal hygiene and kitchen hygiene should be a concern for all well-meaning Ghanaians. The tasks cooks undertake at the kitchen which include preparing the foodstuffs for preparation, washing of dishes, cooking and serving of

meals are sometimes done in smaller groups which makes it quite difficult for matrons to supervise the extent of hygienic practices exhibited. Obviously, it would be comforting if cooks know the importance of hygiene and practice them without reminder. In the light of this, this study would find out how far cooks know of and practice personal hygiene and kitchen hygiene at their work place. The most nutritious meal is surely unwholesome if it is contaminated. This study would go a long way to address the instances of contaminating foods meant for students out of ignorance.

Studies by Saba *et al*, (2012) have shown that unhygienic food and other forms of contamination of our daily consumables have led to the ailment of many students throughout Ghana. This is sometimes the case in boarding house schools where lack of education on hygiene, poor hygienic practices, lack of qualified personnel, poor cooking systems among other reasons have left students at the mercy of any outbreak caused by unhygienic food intake.

These concerns became necessary as observation has shown that students in the boarding house in Zabzugu Senior High School seek for permission to go to the hospital with the complaint of stomach ache. Their colleagues in the day system do not complain of such problems while in school. The frequency of these demands attracted the attention of the researcher, being a house mistress in the said school to conduct this research to find out the meal preparation patterns that exist in the school. In other words, she intends to find out whether the problem is caused by unwholesome cooking and eating environment in the school or by inadequate hygienic food practices at the kitchen or not. There should therefore be a paradigm shift from looking for the cure for diseases, especially those related to food and focus on how they could be prevented.

As food has, to a large extent, an impact on people's health, we may have to find out whether there had been any health issues of students that could be linked to their meal. Surely health deserves.

### **1.3 OBJECTIVES OF THE STUDY**

The specific objectives of the study were to;

1. examine the meals provided for Zabzugu SHS students.
2. examine meal preparation patterns and the hygienic practices in the school's kitchen.
3. assess the relationship between meals and the health status of students.

### **1.4 RESEARCH QUESTIONS**

The researcher seeks to find measures that would assist in solving the following research questions

1. What are the specific meals provided for Zabzugu SHS students?
2. What are the meal preparation patterns in the school's kitchen and the existing hygienic practices?
3. What are the relationship between the meals served and the health status of students?

Answers to these questions will form the basis of our research which, we hope, will ignite the needed attention that meal preparation pattern for boarding house students deserves either in Ghana in general or that of boarding house schools in the north in particular.

### **1.5 PURPOSE OF THE STUDY**

In course of my interactions with students in Zabzugu Senior High School as a Housemistress, I noticed frequent demand for permission by boarding house students to attend hospital due to stomach upset. As a food and nutrition teacher, I asked what could be the course of the problem that is peculiar to only the boarding house students but not their counterparts at the day system.

My mind turned on the meal served in the school's kitchen as a possible difference between the two categories of students. As a little of negligence of hygienic practices could cause food contamination and its associated ailments, I consider it important to investigate the meal preparation patterns in the school's kitchen.

### **1.6 SIGNIFICANCE OF THE STUDY**

It is the hope of the researcher that the findings of the study will go a long way to alert all stakeholders in the feeding of boarding students in our Senior High Schools to take keen interest in the meal preparation pattern in the schools. It will also create awareness among the cooks as well as the students who consume the foods about the importance of hygiene in handling food.

This study will open the flood gates for subsequent investigations into the relationship between meals consumed and the health of students in Ghana and the world at large.

More importantly also is the fact that I have applied to pursue this postgraduate programme and to undertake this research in order to enable me to acquire more advanced knowledge and skills that will subsequently be utilized to the benefit of academia and the world at large.

### **1.7 Hypothesis**

It was hypothesized that the food service providers in boarding schools in Ghana do not adequately adopt the three key hygienic practices; personal hygiene, food hygiene and environmental hygiene. It is thereby presumed to be a cause of contaminating students' meals unknowingly which impacts negatively on students' health. It is presumed that regular in service training for food service providers in boarding schools could prevent or decrease incidence of food-borne illness in boarding schools in Ghana.



## **1.8 DELIMITATION**

Being aware of time constraint and logistical difficulties in getting immediate responses from every concerned Ghanaian, the researcher would therefore like to narrow the scope of the study on food preparation pattern at Zabzugu Senior High School.

Narrowing the scope of the study enabled the writer to focus on meal preparation patterns adopted in the said school since this aspect has not been covered by previous studies.

## **1.9 LIMITATIONS**

Like all other studies, this research is not perfect. The researcher is aware that there are weaknesses that, in one way or the other, affected the results.

Taking the selection of the population for instance, the writer would have like to study on all her target population of the study which is all Senior High Schools with boarding facility in Ghana, but financial constraints, coupled with limited time frame of this work, made it impossible for the writer to cover all the schools to collect data for the study. Rather an accessible population, (i.e. Zabzugu Senior High School) is chosen as a sample.

Obviously, representing the various phenomena pertaining in the entire population by those of the sample school may not produce accurate results of the study. For example, the meal preparation and eating environment patterns obtained from the sample college may be slightly different from others.

Again, due to logistical constraints, not all individuals concerned have been involved in the study. This, in the view of the writer, was not enough to reveal all the information that not has hitherto been noticed by the researcher. Another weakness the researcher must admit was the sampling method used, (simple random sampling) in the study. This may not be in the same proportion as found in the population; hence the sample obtained was not a replica of the population.

## 1.10 ORGANIZATION OF THE STUDY

In order to achieve the needed results, the researcher decomposed the work into five chapters. Chapter one is dedicated to a comprehensive introduction which will inform, at first hand a reader of the research. This chapter expatiates on what prompted the researcher to choose to undertake the study, the objective set as well as w the way the study is organized. This chapter ends with the definition of a number of terms that will be vital throughout the study.

Chapter two provides the overview of existing literature as well as the theoretical framework of the study. This chapter will be dedicated to the stake of other writers on food outside home and also tell how different this study would be from others. This chapter will also expose some theories related food and diet. This part of the work will end after giving a vivid insight on menu and hygiene in catering environments.

Chapter three describes the methodology employed in collecting the required data for analysis. This entails the population and sample of the study and the research instruments used to conduct the investigation among others.

Chapter four is dedicated to the presentation of results and subsequent findings gotten.

Chapter five presents the summary of findings, conclusion and recommendations.

## 1.11 DEFINITION OF TERMS

For the purpose of this study, the following operational definitions have been used:

**Menu:** The food available or to be served in a restaurant or at a meal.

**Meal:** The food served and eaten in one sitting.

**Kitchen hygiene:** The term is used here to describe the acceptable culture of preservation and preparation of foods in a manner that ensures the food is safe for human consumption.

**Personal hygiene:** The good practice of neatness exhibited by a person which enhances healthy living.

**Kitchen:** the place where meals are prepared.

**Storage environment:** the place where foodstuffs are stored for future use.

**Boarding school:** a school where students are lodged and fed as they go on with their studies.

**Food borne diseases:** ailments that results from eating of contaminated or unwholesome food products.



## CHAPTER TWO

### LITERATURE REVIEW AND THEORETICAL FRAMEWORK

#### 2.0 INTRODUCTION

This chapter reviews work of various authorities related to the topic. It looks at both empirical and theoretical facts which relate to the topic. They are reviewed under the following themes: types of meal prepared for SHS students; meal preparation patterns in Senior High Schools; relationship between meals and health status of students, as well as theoretical framework.

#### 2.1 Types of Meal Prepared for SHS Students in West Africa

Striving to build a future that would be resilient and buoyant for all, we are required to be concerned above the human resource of the country. The human resource development is closely linked to the wellbeing of people. The cognitive development of students, who are the potential future human resource of any nation, is impacted by nutrition, genes and environment (Tuttle, 2000).

A majority of Secondary School students throughout Africa fall under the adolescent age 11-19 years. This stage in life is so crucial because according to Lulinski (2001), it is a period of time when their bodies are metamorphosing and evolving into that of an adult. The student's state of nutrition has a short-term and long-term impact on cognitive ability, academic performance and productivity in adulthood. Increased nutritional needs at this juncture relate to the fact that adolescents gain up to 50% of their adult weight, more than 20% of their adult height and 50% of their adult skeletal mass during this period (Brasel, 1982).

Though we cannot tell which meal can help children to be cleverer, the role of good nutrition in child development is undoubtedly important. Food provides the nutrients needed to build and maintain the body cell in human beings. Wardlaw (2003) and Worthinton-Roberts & Williams (1996) assert that nutrients are chemical substances that must be obtained from food

to function as provider of energy, body building, and the maintenance of the body cells. Besides the nutritive values, food also satisfies hunger and promotes growth and development (Telljohann, *et al.* 2004).

Nutrients that the body derives from food are carbohydrates, lipid, protein, vitamins, and mineral salts and water (Walter, 2000). All the nutrients are needed for growth, and development of the individuals in their require quantities (Liebman, 2001).

The search for related literature reveals that there is a limited national and international quantifiable and generalizable data to describe the meals provided for students in second cycle schools in West Africa. However, this information gap has not limited the growing discourse and concern within public and academic sectors over the past decade.

A study carried out in a boarding school in Nigeria to assess the nutritional status of forty students between the ages of 10 to 19 years showed that students in that boarding school were generally malnourished with inadequate energy intake especially among students of younger ages (Akinyemi and Ibraheem, 2009). According to the research, children in boarding schools may be at higher risk of developing nutrient deficiencies compared to those in non-boarding school, probably due to financial constraints in running boarding facilities.

Parents have lesser control on what the adolescents eat especially when they go to school. However what their friends eat in the school and what is available to them in the school environment may have an impact on their food preference. This point is reinforced by the International Food Information Foundation Council (2009). According to the council, social pressure has a major influence on teenagers' food choices because that is the time they want to gain peer acceptance or insist on independence from parental authority. Also according to Neill *et al.* (1997) what students eat at school is dependent on many factors, including the cafeteria environment, peer pressure, administrative support, teacher participation, cafeteria

staff and the quality of food choices offered. Peer pressure can thus be an important determinant in one's choice of food.

Stating the importance of proper feeding of students, the Federal Ministry of Education of Nigeria (2006) indicated that healthy eating patterns are essential for students to achieve their full academic potential, full physical and mental growth, and lifelong health and well-being. Talking on food services being part of school health education programme (SHEP), the Ministry indicated that the feeding should take place in the dining room / hall where the meals are served under the supervision of the teachers with the appropriate teaching on health habits.

Kurz and Johnson- Welch, (1994) stated that the main nutritional problems affecting adolescent populations worldwide and Nigeria in particular include under-nutrition such as deficiencies of micronutrients such as iron and vitamin A, etc.

Looking at the impact of food on one's growth, (Chin-Hung Guo/ *Pakistan Journal of Nutrition*, 2009) believes that it is necessary to evaluate the quality of meals and snacks served to both secondary school and university students to know their contribution to nutrient intake in order to alleviate the problem of malnutrition in adolescent female Nigerian students.

A study conducted jointly by the Department of Human Nutrition and Dietetics, Michael Okpara University of Agriculture and (Chin-Hung Guo/ *Pakistan Journal of Nutrition*, 2009) identified a high consumption of red palm oil, being a food item in most meal, among the secondary school girls in Abia States in Nigeria, satisfies their vitamin A requirements. The study further indicated that the richest source of retinol in Nigeria is red palm oil.

A study conducted in Nigeria by Olumaikaiye *et al.* (2010) on food consumption patterns of Nigerian adolescents in secondary schools and effects on body weight to determine the association between nutritional status of adolescents and food consumption pattern showed

that more than half of the participants ate three meals daily. They realized that the rate of underweight was higher among those who did not take snacks but ate three meals a day, but the rate is less among those who ate snacks twice a day in addition to their three main meals. They concluded that snacking was important in improving nutritional status.

The conception of balanced diet to an average Nigerian student is the consumption of palatable food that builds the body irrespective of the nutrients contained in it. Armstrong (1997) however recommends that adolescents should rather be given foods that contain nutrients and ingredients that help build the body, which makes the tissues grow well. He suggests further that the meals provided for these adolescent students should contain vitamins and, preferably, first class proteins (meat, fish, eggs, shrimps, crayfish etc.) or second class proteins (beans peas, etc.)

### **2.1.1 Meals provided for SHS students in Ghana**

Kwame Nkrumah, Ghana's first President introduced a policy of mass education and established dozens more secondary boarding schools throughout the country. In the reports by the mainstream media, these schools are credited with helping to narrow ethnic cleavages that plague many other countries in the region (Obeng, 2002).

Despite this beautiful idea, it is noted in recent times that feeding students in boarding institutions poses lot of challenges to authorities, which in most cases results in students' unrest or demonstrations leading to suspension of academic activities. (Sekyere, 2011). Some of these challenges include delays in payment of boarding fees by parents as well as the release of scholarship grants. Though the Government of Ghana subsidizes second cycle education, the boarding fees of students in the northern Ghana have further been absorbed by the Government to reduce the educational gap that exists between the South and the North. However, Van-Ess Josephine/ modernGhana.com (2 September, 2008), observed that projects undertaken by the GES are mainly for classrooms and other academic areas but the

catering department is almost always left out of the scheme. She further cited inadequate supplies of catering equipment and utensils, lack of storage facilities and portable water in some schools makes catering services very difficult for domestic bursars.

Boarding students in Senior High Schools in Ghana are provided three meals a day; breakfast, lunch and supper. These meals are derived from traditional Ghanaian foodstuffs and imported foods. School authorities choose the staple food of the people as a means of complimenting the nutritional needs of the students. School authorities adopt a unified weekly menu for students in the boarding houses to avoid comparing of meals served in a particular school to those in other schools.

In the savanna zone, maize and yams are the staple foods in the Northern Region and millet in the Upper Region. One of the conclusions of the National Nutrition Survey in 1961 was that the northern savanna suffered from an overall lack of food, notably in the pre-harvest period.

School authorities in Ghana provide a lot of fermented meals to boarding students which is scientifically identified by Marquis, (2007) that fermentation is known to improve nutritional quality of food as well as reduce bacterial contamination. Such meals as Banku, Kenkey, Tuo Zafi, porridge, etc. are the delicacies in Ghanaian Senior High Schools.

Although, meals are provided for students, they do not like every meal served them. They demonstrate their preference for some selected meals by rushing for them and, on other hand, show little interest in other meals. A study by den Hartog (1972) showed that students like imported foods, bread and tea, at breakfast both in Accra and in Tamale; but not at the expense of the traditional foods such as porridge from maize and millet. The study further exposed the fact that students prefer traditional foods such as kenkey, yam slice, banku, tuo zafi, and rice and beans (wakye) at lunch and supper. This study revealed the characteristic nature of adolescents who like to make their own choice. Healthy adolescents have very big



appetite. According to Shepherd and Dennison (1996), the challenges adolescents (including those in Senior High Schools) face in an attempt to satisfy their appetites include taste and quality, cost and health, nutrition knowledge of parents and peers.

Parents have recently been accused of causing students in boarding schools to have appetite for meals that are not served in the schools. Addressing the second Biennial Delegates Conference of National Association of Bursars and Matrons (NADBAM), Van-Ess Josephine was reported on modern Ghana.com (2 September, 2008) that the craze for fast food and ‘take away’ by students is fuelled by parents who visit their wards with such foods.

A study by Owusu *et al.*, (2007) in measuring the nutritional intake of adolescents in Ghana discovered that adolescents in Senior High Schools in Greater Accra Region and Eastern Region made bad food choices although they were fed with nutritionally adequate meals in their boarding schools.

## **2.2 Meal Preparation Patterns in SHS**

Recognizing the crucial role food plays in humans, it is important that attention be paid to how the preparation of meals is done especially for boarding students in Senior High Schools. Surely, the fast growing adolescents need food that is adequate and nutritious and served under hygienic conditions to keep the students healthy, alert and able to study. Catering and other establishments where meals are prepared are among the most frequent cited sources of sporadic outbreak foodborne infections (Griffith, 2000; Griffith *et al.* 1994; Jin *et al.*, 1997; Scott, 1996; Tarsitani *et al.*, 1998). According to Food and Drug Board (2006), a lot of people fall ill and many do suffer serious disorders, long-term complications or die as a result of eating unsafe food. On the light of this accession, this sub-topic will further be treated under two sub-topics. These include hygienic practices employed in food preparation in Ghanaian Senior High Schools and cooks knowledge on menu and food preparation.

### **2.2.1 Hygienic Practices on Food Preparation in boarding schools**

There are a number of things which should be taken into consideration when preparing, storing, or cooking food. Bacteria spreading from one food to another are a major cause of food poisoning.

Our review explores this aspect by exposing what to expect in a food premises in boarding schools which are any premises or areas of premises in which food is prepared, served or stored.

This is because environments in which people live are complex and their individual and combined elements have a marked effect on people's behaviour and dietary intakes. Individuals interact, according to Swinburn, Egger and Raza (1999), in a variety of micro-environments or settings such as schools, workplaces, homes, restaurants and fast food outlets.

The preparation and serving of school food should take place in a hygienic and well organized setting.

Food, according to U.S Center for Food Safety and Applied Nutrition, (2006) can become contaminated by toxic chemicals or toxins in the establishment or in the environment. Physical objects may also contaminate food and cause injury. Food may become naturally contaminated from the soil in which it is grown or from harvest, storage, or transportation practices. Some foods undergo further processing and at times, despite best efforts, become contaminated. These inherent hazards, along with the hazards that may be introduced in your establishment such as metal fragments from grinding can lead to injury, illness, or death.

The Centers for Disease Control and Prevention (CDC) Surveillance Report for 1993-1997, identifies five categories of factors that risk food contamination. To them, food borne illnesses can result from either food from unsafe sources, inadequate cooking, improper holding temperatures, contaminated equipment or poor personal hygiene.

The Food Safety (General Food Hygiene) Regulations 1995, indicated among other things that food premises must be kept clean and maintained in good repair and condition; the layout, design, construction and size of food premises shall: (a) permit adequate cleaning and/or disinfection, (b) be such as to protect against the accumulation of dirt, contact with toxic materials, the shedding of particles etc.

School food operators should as a matter of necessity keep the following basic principles in mind. Eating environment according to the said Regulations 1995, should be located in an area where the risk of contamination from refuse, waste water and other harmful or toxic substances is nil or minimal. If that risk cannot be totally eliminated, the displayed food should be covered and protected from contamination.

With respect to school's setting, Story Nanney , Schwartz (2009), for instance, revealed that schools play a key role in affecting the diets and health of children and adolescents. Outside of their homes, most children spend the majority of their time in schools, where students who eat school meals for breakfast and lunch may consume over half of their daily calories. (Gleason, Suitor. (2001).

So, observing good rules of hygiene in the storing, preparation and serving of school meals will help deal effectively with potential hazards and to ensure food safety.

### **2.2.2 Cooks' Knowledge on Menu and Food Preparation Skills**

Menu plan comes into play to ensure a balance in the provision of meals offered to the public. Menu, which can simply be described as a list of dishes served at a meal, can also be explained in different terms depending on the setting of the user. Wansink, *et al.* (2005) explained menu as a list or a card which documents the food and beverage options being offered. Menu planning means to compose a series of dishes for a meal. Composing a good menu is an art and it needs careful selection of dishes for the different courses so that each dishes harmonies with the other. The planning of meals in commercial catering establishment

according to Kivela (2003) is based more on economic considerations and reputation than on the desire to provide nutritionally “balanced diets”. The dishes produced are intended to please the eye and the palate. The planning of menu for school feeding has a different aspect where nutritious and well-balanced foods are compiled. Kivela (2003) further noted that menu should provide nutritious food, foods that tempt the appetite, and satisfy the consumers. A lot of considerations go into preparing menu for feeding students especially those in boarding houses. Though the focus of catering services in schools is to provide a balanced diet to aid nutritional needs of students, matrons and domestic bursars take into consideration the availability of foodstuffs, cost, and acceptability of the food by consumers. This issue brings about some variation in nutritional content of food for students in various regions of Ghana.

Bhatia, (2013) indicated that the range of food commodities provided to students and its nutritional content varies according to the region of Ghana and the time of year. Essentially the food commodities consist of carbohydrates such as rice, plantain, or yam accompanied by a stew with protein and vegetables (e.g. stew based on palm oil, tomato and onion, with fish or meat). Iodized salt is used, as may other fortified foods such as vegetable oil.

The importance of healthy meal choice, Short (2003) and Lyon, Colquhoun, Alexander (2003) acknowledged that the inevitable continual shift and change in the culture of cooking and food preparation which comes along with the ongoing social, environmental and technological changes should not be a barrier to efforts to empower healthy food choices, dietary habits and enjoyment in food preparation.

### **2.3 Relationship between Meals and Health Status of Students**

The old age adage, “you are what you eat” replays when one thinks of what to eat. While developed countries battle with obesity, developing countries are faced with diseases such as anemia, diarrhea and pneumonia due to deficiencies in the diet of people. Whatever the

situation, man must eat to survive. The available literature on the impact of food on people's health, show rather a funny contrast. While poor people may look at malnutrition as inadequacy in nutrients in a diet, the rich could see it as an overdose of certain nutrients which cause them obesity.

Obviously, the relationship between food and health becomes more noticeable when one considers how nutrition can have an effect on one's health either by improving it, or making it deteriorate; and how likewise health can also affect nutrition by either improving the individual's appetite or making it deteriorate.

A report by GNA, (Sept. 20, 2012), indicated that under nutrition contributes to about half of all child deaths beyond early infancy whilst one out of every thirteen children in Ghana die before their fifth birthday mostly as a result of under-nutrition. Mrs Amoaful, Deputy Chief Nutrition Officer at the Ghana Health Service, explained further that the Central, Eastern, Northern, Upper East and Western regions were the most affected regions and that malnourished children were more likely to die of illnesses such as malaria, diarrhea, pneumonia and complications from HIV.

To her, under nutrition could also impact negatively on education as well as the nation's economic productivity and development.

The availability of safe food, according to W.H.O (2002), improves the health of people and is a basic human right. Safe food contributes to health and productivity and provides an effective platform for development and poverty alleviation.

This same report, W.H.O (2002) again indicated that changes in eating patterns, such as a preference for fresh and minimally processed foods, the increasingly longer interval between processing and consumption of foods and the increasing prevalence of eating food prepared outside the home all contribute to the increased incidences of foodborne illness ascribed to microbiological organisms.

Complex carbohydrates take much longer time to digest in the body than simple carbohydrate (USDA, 2000). According to Wardlaw (2003) food such as bread, some cereals, fruits, yam, rice and vegetable are sources of complex carbohydrates. Adolescent students should use these food as the major sources of energy supply for their normal body functions and activities because energy from these food are the best and they take longer time to digest (Ghana Home Economics Association (GHEA), 1990).

Eating of more calories, does not necessarily mean eating healthier food. For example, fats and more calories, combined with a decrease in physical activities, can create an obesity problem. According to a study conducted by Ghana Statistical Survey, Noguchi Memorial Institute for Medical research and GDHS (2003), only about three percent 3% of children in Ghana are overweight report. The report further added that this is within the normal range for a healthy population; however, twenty two percent 22% of them are underweight. This survey suggests that a lot of Ghanaian children are fed with diets that have inadequate proportion of growth aiding nutrients resulting to the problem of underweight.

In Senior High Schools in Ghana, some students suffer from psychiatric problems which have often hastily associated to consumption of narcotic substance. But is that always the case?

Talking about the relationship between food and mental health, Colquhoun, and Bunday. (1981) stated that food affects how we feel, think and behave. Explaining further, the report also indicated that it becomes obvious that what we eat is affected by why and how we eat, both of which may also have an impact on our mental health. For example, if we see food purely as a means of re-fuelling, our meal times will affect us differently than if we see food as a vital source of nourishment for our body and mind.

A key factor that is associated with both mental health and diet according to Rogers, & Pilgrim. (2003), is poverty. This is closely tied to employment and levels of earnings and these issues also relate to what, why and how people eat.

Furthermore, increased salt consumption is associated with raised blood pressure, and increase the risk of cardiovascular disease (Elliott, Stamler, Nichols, Dyer, Stamler, Kesteloot & Marmot, 1996).

Talking on the health impacts of junk foods, Allamani A. (2007) revealed that junk food allows people to eat without planning - eat not only when it is pre-set meal time, but also when they have spare time. Ingredients of junk foods give great taste and make them addictive. Indicating the hazardous impact of junk food on health Bandini, Vu, Must, Cyr, Goldberg, and Dietz. (1999), explained that high fat content, particularly cholesterol, sugar and salts have their adverse effects on health.

An unhealthy diet is one of the key risk factors for non-communicable diseases. For example, inadequate consumption of fruit and vegetables increases the risk for cardiovascular diseases and several cancers; high salt consumption is an important determinant of high blood pressure and cardiovascular risk and increases the risk of stomach cancer; high consumption of saturated fats and trans-fatty acids is linked to heart disease; a range of dietary factors have been linked with diabetes; red and processed meat consumption is linked with some cancers (W.H.O, 2003; Steyn et al., 2004; WCRF, 2007).

People living with HIV/AIDS also face increased challenges in maintaining proper [nutrition](#). Despite developments chalked in medical treatment, Johansen and Diana. (2007), testifies that nutrition remains a key component in managing this condition. The challenges that those living with [HIV/AIDS](#) face can be the result of the [viral](#) infection itself or from the effects of anti-HIV therapy.

Some of the side effects from anti-HIV therapy that may affect how the body absorbs and utilizes nutrients according to Riddler, Sharon A. (2003), include [fatigue](#), [nausea](#), and poor appetite. As well, the nutritional needs of people with HIV/AIDS are greater due to their [immune system](#) fighting off [opportunistic infections](#) that do not normally cause disease in people with healthy immune systems. Medication along with proper nutrition is a major component of maintaining good health and quality of life for people living with HIV/AIDS. (Thomson, (2010).

Senior High School students in Ghana take three square meals per day (breakfast, lunch and supper).

Breakfast is the first meal of the day, after the body is without food for about eight hours. Dishes for breakfast according to Oti-Mensah, (2005) should therefore be nutrient dense enough to supply the students with all the nutrients needed by the body. According to Munoz, *et al.* (1997) breakfast should supply about one-fourth of the nutritional requirements of the day. Packard, (2006), attested that eating breakfast affects both cognitive and physical performance; that is, if a student eats breakfast, he or she may be more alert in school and better able to learn and to perform sports or other physical activities.

## **2.4 Theoretical Framework**

This part of the research treats theories related to our topic. A theory is formal set of ideas that is intended to explain why something exists or happens. It is an attempt to organize and integrate knowledge and to provide reasons for occurrences (Peterson, 1984). A theory organizes, interprets, and states in the form of laws or principles the facts and knowledge in an area. The organization or arrangement of what is known makes it possible, a systematic description from which explanation and prediction can be derived and systematically tested.

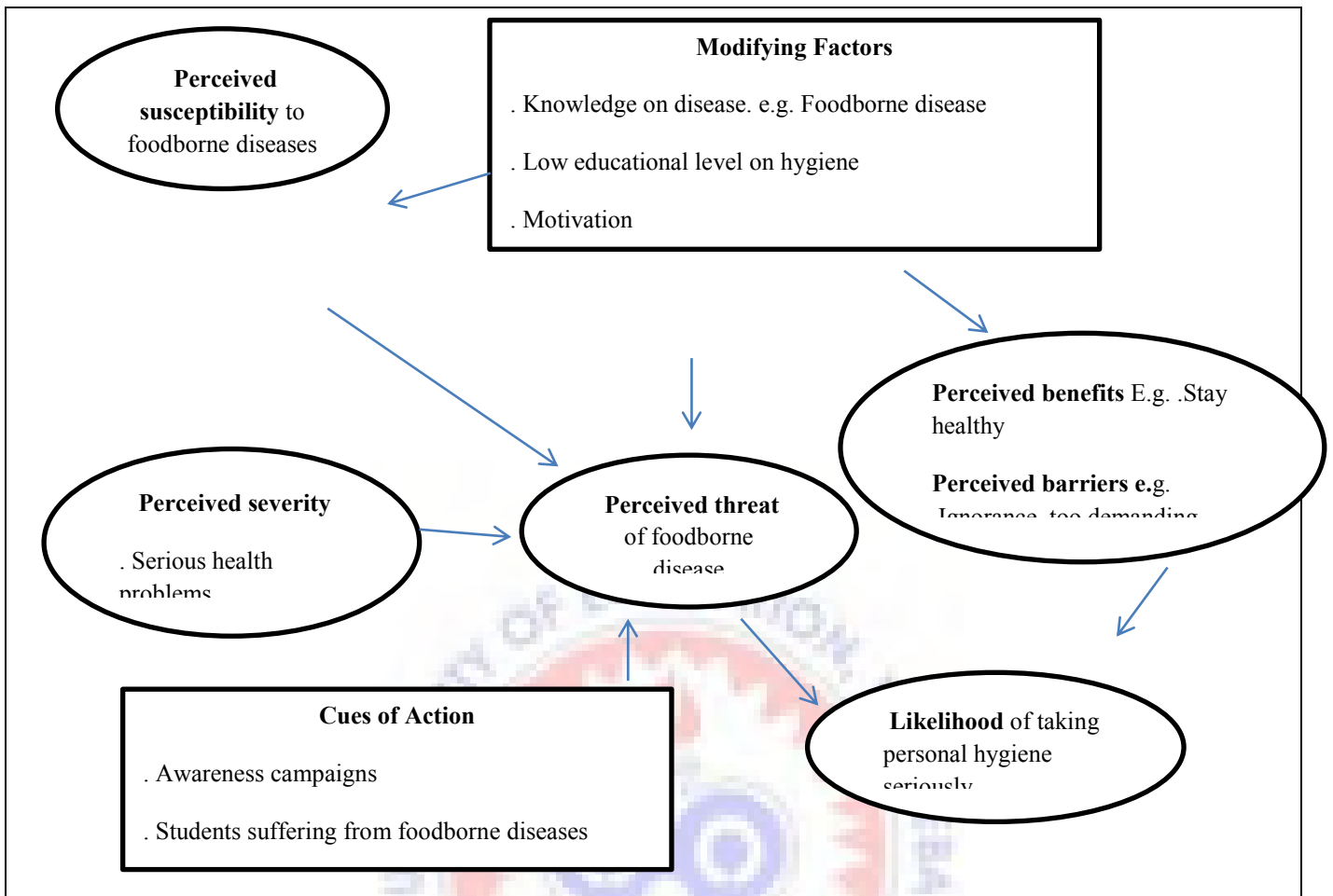


Theories and models help explain behavior, as well as suggest how to develop more effective ways to influence and change behavior.

We adopt Health Belief Model for this work.

#### **2.4.1 Health Belief Model**

The Health Belief Model (HBM) was developed to help understand why people did or did not use preventive services offered by public health departments in the 1950's, and has evolved to address newer concerns in prevention and detection (e.g., mammography screening, influenza vaccines) as well as lifestyle behaviors such as sexual risk behaviors and injury prevention. The underlying concept of the original HBM is that health behaviour is determined by personal beliefs or perceptions about a disease and the strategies available to decrease its occurrence (Hochbaum, 1958). The HBM theorizes that people's beliefs about whether or not they are at risk for a disease or health problem, and their perceptions of the benefits of taking action to avoid it, influence their readiness to take action. This model operates on certain variables or constructs which include perceived susceptibility (one's opinion of chances of getting a condition), perceived severity (one's opinion of how serious a condition and its sequel are), perceived barriers (one's opinion of the tangible and psychological costs of the advised action), and perceived benefits (one's opinion of the efficacy of the advised action to reduce risk or seriousness or impact) and cues of action (strategies to activate "readiness"). All these perceptions revolve around a perceived threat of ailment; say a foodborne disease. The interrelationship between these constructs is presented in the diagram below. A fear of contracting a foodborne disease resulting from unhygienic practices is used as an example of a perceived threat.



The core constructs of the HBM are explained below:

### **Perceived Severity**

This construct speaks to an individual's belief about the seriousness of a disease. Though the perception of seriousness is often based on medical information or knowledge, it may also come from beliefs a person has about the difficulties a disease would create or the effects it would have on his or her life in general. When one suffers from a foodborne disease, one's perception of the illness could be that it is a serious disease.

### **Perceived Susceptibility**

Personal risk or susceptibility is one of the powerful perceptions in prompting people to adopt healthier behaviours. The greater an individual perceived a risk, the greater the likelihood of him engaging in behaviours to decrease the risk. Obviously, when people believe they are at

risk for a disease, they are often more careful to do something to prevent it from happening. However, the opposite also occurs. When people believe they are not at risk or have a low risk of susceptibility, unhealthy behaviour tend to result. Simply put, a perception of increased susceptibility or risk is linked to healthier behaviour, whereas, decreased susceptibility is linked to unhealthy behaviour. Unfortunately, just a perception of increased risk does not always lead to behaviour change. For instance, although older adults are among the groups most vulnerable to foodborne illnesses (Gerba, Row, and Haas, 1996), they still do not use safe food-handling practices all the time. (Hanson and Benedict, 2002)

### **Perceived Benefits**

This construct is a person's opinion of the value or usefulness of a new behaviour in decreasing the risk of developing a disease. In other words, people adopt healthier behaviours when they believe the new behaviour will decrease their chances of contracting a disease. For example, people strive to eat fruits and vegetables daily because they believe it is beneficial to their health.

### **Perceived Barriers**

Acknowledging the difficulty associated with change in people, this construct of HBM addresses the issue of perceived barriers to change. This is an individual's own evaluation of the obstacles in his or her way while trying to adopt a new behaviour. Janz and Becker, (1984), even noted that perceived barriers are the most significant in determining behaviour change. In order to overcome the perceived barriers, one needs to believe that the benefits of the new behaviour outweigh the consequences of continuing the old behaviour. Some of these barriers include difficulty with starting a new behaviour or developing a new habit, fear of not being able to perform the practice correctly, embarrassment, etc.

### **Modifying Variables**

The four major constructs are modified by other factors such as culture, educational level, past experience, skill, motivation etc. These factors influence people's personal perceptions. For example, if someone was treated from cholera, he or she may have a heightened perception of susceptibility because of this past experience and become more conscious of personal hygienic practices.

### **Cues to Action**

Apart from the four beliefs or perceptions, the HBM suggests that behaviour is also influenced by cues to action. Cues to action are events, people, or things that move people to change their behaviour. Examples include illness of a family member, media reports, (Graham, 2002), or health warning labels on a product. Knowing fellow neighbour diagnosed of foodborne disease is a significant cue to action for a person to practice personal hygiene while handling food.

### **Self-Efficacy**

Self-efficacy, according to Bandura, (1977), is the belief in one's own ability to do something. People generally do not try to do something new unless they think they can do it. If someone believes that a new behaviour is useful (perceived benefit), but does not think he or she is capable of doing it (perceived barrier), chances are that it will not even be tried at all.

In summary, Health Belief Model's modifying variables, cues to action, and self-efficacy affect people's perception of susceptibility, seriousness, benefits, and barriers and as well as their behaviour.

## Summary and Conclusion

This research –the meal preparation patterns in boarding schools and its impacts on the health of students: a case study on Zabzugu Senior High School”, is conducted in three thematic areas namely:

- Meal prepared for SHS students;
- Meal preparation patterns in Senior High Schools;
- Relationship between meals and health status of students.

It is revealed from the literature reviewed that all the students in Senior High School in Ghana are adolescents who need a lot of food to aid their growth and studies. They are provided three meals a day. The meals are reportedly nutritious and balanced. Most of the meals are derived from traditional Ghanaian staple foods such as banku, kenkey, yam slice, etc. the rest are imported foods such as rice, milk, tea, etc., to complement the local ones.

Literature further indicated that food, no matter how nutritious it is, becomes unwholesome for consumption if it is contaminated with pathogens through unhygienic practices. It also became obvious that unhygienic practices are mostly a cause of food contamination which also leads to foodborne diseases such as diarrhea, cholera, typhoid fever, etc. In order to prepare a variety of balanced meals for the students, menu plan was viewed as been an indispensable element of food service for students. Cooks need to muster food preparation skill which will make a well- planned menu successful.

It also brought our attention to the fact that foods have direct impact, either positive or negative on the consumer. In other words, good and healthy meals enhance good health while unwholesome and junk foods cause obesity, hypertension etc. Meals served for students impacts, not only on their physical performance but also on their cognitive performance.

Looking at all the revelation of our literature, the researcher noticed that there is the need for an attitudinal change toward stringent practice of hygiene. In that regard, the researcher

adopted a social behavioral and health related theory, Health Belief Model as a framework on which the research be conducted. The analyses of this theory revealed that if a person know he is vulnerable of a health concern, he or she will be willing to undergo a behavioral change no matter the challenges therein if he knows the benefits of that change outweighs the cost or challenge he would encounter.

To conclude, researcher will like to cause a positive attitudinal change by all who handle food to enhance prevention of foodborne diseases instead of looking for cure for such ailments.



## **CHAPTER THREE**

### **3.0 METHODOLOGY**

This research seeks to analyze the meal preparation pattern for boarding students in Senior High Schools in Ghana. In order to achieve our set objectives, we dedicate this chapter to giving a comprehensive overview of all that there is to do to collect the required information for analyses.

This chapter has been discussed extensively under the following sub-headings: Introduction, Research Design, Population and Sampling procedure, Research Instruments, Procedure for data collection and Procedure for data analysis.

#### **3.1 RESEARCH DESIGN**

For the purpose of this research, the researcher chose a case study design in addressing our research questions. This design is a typical demonstration of qualitative method of research. According to Gate & McDaniel (2004) qualitative paradigm is that research which examines attitude, feelings and motivations of a phenomenon. It therefore implies that the study employs holistic approach in an investigation to find out quality between situations, actions, and relationships through opened-ended questions and unstructured responses that reflect the person's thoughts and feelings on the subject of investigation.

As the purpose of this study is to ascertain the true picture of meal preparation pattern for boarding students in Zabzugu Senior High School in a holistic manner, the researcher prefer to adopt this design. This enabled the researcher to gather enough information regarding the meal preparation pattern in Zabzugu Senior High School.

This design also helped in identifying predominant health challenges students face as a result of the consumption of those meals. Thanks to this design, the researcher was able to paint a vivid picture of the pertaining conditions in the kitchen, the store and the dining hall of the Zabzugu Senior High School.

## **3.2 POPULATION AND SAMPLING PROCEDURE**

### **3.2.1 Study Area**

This study was conducted in selected Senior High Schools in the Northern region of Ghana. There are about 38 public senior high schools. All students in these schools benefit from subsidy from government of Ghana which enables them to attend school at a lower cost as compared to their counterparts in south. Parents do not pay boarding fees for the upkeep of their wards. The government of Ghana bears the cost of feeding and other fees for all students in the Northern region. This policy dates back to the regime of Dr. Kwame Nkrumah, Ghana's first President. It was aimed at enhancing enrollment in schools in the North in order to bridge the educational gap that existed between the North and the South. This programme has however be bedeviled with financial constraints on the part of the various governments us the number of children in the Northern schools has increased dramatically. This results in delays in the release of funds for the feeding of students. Heads of these schools sometimes rely on benevolent suppliers whose businesses always suffer from the delays. They manage to feed the students on credit until they paid the feeding grant especially when the term is ending. During these tying moments, students are not provided the required meals on the school's menu due to difficulties in getting supplies. Sometimes, those suppliers refused to further supply foodstuffs to the schools until their debts are paid. When that happens, Conference of Heads of Assisted Secondary Schools, (CHASS), closes down the schools.

With the aforementioned facts, it was important that an assessment on the provision of food to students in schools at the North was conducted in these schools with a view of developing sustainable mechanisms to address the possible food related ailments amongst students. The study targeted public, schools.



### **3.2.2 Population**

The target population in the study comprised all students drawn from Zabzugu Senior High School. This constituted both male and female students of this institution who were of varied ethnic backgrounds. They were however dominated by the Northern tribes, particularly, the Dagomba tribe.

The research covered all the three year groups of the school but was centered on the third year students of these schools because of their experience and academic maturity. Students in this category numbered 600 comprising 240 girls and 360 boys. In addition, some of the staff strength of 68 teaching and non- teaching staff was selected for interview.

### **3.2.2 Sample**

Getting a sample in a research study is very important. This is because all members of the study area cannot be studied. For this reason a sample consisting of 100 respondents was selected from 600 students and used. Out of a total number of 240 girls and 360 boys in the school, 40 girls and 60 boys were sampled. Twelve staff members were also selected from the staff strength and interviewed on one -on -one basis. These include 5 assistant cooks and 1 matron and six (6) members of staff, comprising of the management, teaching staff, storekeeper and the bursar.

### **3.2.3 Sampling Techniques**

A multistage sampling strategy was used to select the participating school. First a listing of all public schools in the Northern region was obtained from the GES database. These were then stratified according to their identifying categories e.g. boarding or day schools. Then using simple random sample method of selection these people were chosen which gave equal chance of being selected; but mindful of gender. In the selected school, six (55%) out of all willing and available food kitchen staff members were involved in the study.

For the study to give boys and girls fair representation, first, the number of boys and girls were identified from the students' attendance registers from the eighteen (18) classes. From each class, sample was selected in proportion to the class size (stratified proportional sampling). In this manner, 60 male students (54%) and 40 female student respondents (36%) as well as 6 male and 6 female staff members (5% each) were selected for the study.

### **3.3 RESEARCH INSTRUMENTS**

Three categories of instruments were used in this study and these included; questionnaire, interview and the observational guide.

#### **3.3.1 Questionnaire,**

In assessing the meals provided to students in Zabzugu Senior High School under study, questionnaire was used. The questionnaire was addressed to students in boarding house of the school. To overcome the difficulties arising from non-submission of filled questionnaires by students and minimize the non-respondent prevalence, the questionnaires were self-administered.

The questionnaire covered demographic characteristics, meals provided and possible health problems associated school meals (see appendix A). This instrument was also used to tap at first hand, data on tangible and observable things that can help the analyses.

#### **3.3.2 Interview**

This instrument was also used to collate data from the kitchen staff and other members of staff in the school. The interviews were in fact semi-structured to help avoid too much deviation from the point. Answers from the interview session were then transcribed for analyses. (see Appendix B). Responses were compared with those from the other two instruments for analysis.

### **3.3.3 Observation**

This instrument was utilized at the time of visit by the researcher in assessing the extent to which cooks in boarding schools in Ghana conform to the three key hygienic practices, (personal hygiene, food hygiene and environmental hygiene) in school kitchens. Specifically, it was used to investigate how the meals were prepared and served, storage of food stuffs, the time interval between meals and the kind of environment in which the foods are prepared, served and eaten (see appendix C). The conditions under which the meals were prepared and served and student patronage of dining hall meals were also observed.

The school kitchen was evaluated on the status and maintenance of the premises, these include; walls, floors, ceilings, ventilation, lighting, vector and rodent control, sanitary conditions of kitchen equipment, personal hygiene of cooks, water supply, waste management and refrigeration facilities. One of the great limitations of the observation is that cooks may change their behavior from the natural, unobserved behavior while under observation. However, efforts were made to minimize the influence of observation by using a known dining hall master as an observer as the cooks would already be accustomed to this observer. Findings from the dining hall master, was compared to the one conducted by the researcher herself.

### **3.4 DATA COLLECTION PROCEDURE**

A letter written by the Head of Catering and Hospitality Department of the University of Education, Kumasi Campus introducing the researcher to the Heads of the schools and to obtain permission to use the schools for the research was distributed to the Headmasters/mistresses. The researcher then spent from Wednesday to Saturday mornings each week in the school to collect the responses for the questionnaire.

To avoid any fear of incrimination, the researcher explained all respondents that the purpose of the research is purely academic and their responses will be treated confidentially.

The researcher first visited the school kitchen to observe the conditions pertaining there as well as their facilities. She equally utilized the opportunity to observe the preparation of breakfast, lunch and supper. In between the various meals, the researcher took advantage to interview the kitchen staff on hygienic practices, daily meals provided for students, etc. She visited the store where foodstuffs are kept observed the conditions under which the foodstuffs are preserved.

The questionnaires prepared for students were distributed to them and later collected after they have answered them.

The interview was on two important aspects of the work. The first part sought to find out the meal preparation patterns in the school. The second part assesses the hygienic practices employed to avoid sickness and ensure good health among consumers of the school's meals. Items 3 to 6 on the questionnaire and interview guide 4 and 8 sought to capture data on meal preparation patterns in the school. The observation guide 5 and 6 also complement the fact on the ground. On the state of hygienic practices among cooks and students, the researcher made use of items 15 to 17 of the questionnaire, interview guide 1 to 3 as well as the guides 1 to 4 of the observation guide.

In order to achieve the desired goal, the spotlight was turned on student's hygienic culture as well as that of the kitchen staff. To authenticate all answers that were given, an observation exercise was also carried out. Questionnaire items 15 and 17 coupled with observation guide 4 provided data on students' hygienic practices while item 16 on the questionnaire and interview guide 1, 2, 3 and 6 coupled with observation guide 1, 2 and 3 assesses the hygienic practices at the school's kitchen.

### **3.5 DATA ANALYSES PROCEDURE**

In this section the main data has been analyzed. This analysis addressed the three research questions that guided this study. As the research is a case study, qualitative data analyses

method was adopted. This enabled the researcher to do content analysis which is the analysis of the contents of an interview in order to identify the main themes that emerge from the responses given by the respondents. The researcher went through a number of processes. Main themes were identified through careful reading of the descriptive responses given by respondents to each question in order to understand the meaning they communicated.

The themes were coded, into manageable categories (words or themes with similar meanings or connotations) of a variety of themes focusing on and coding for specific words patterns that were indicative of the research question. Repetitions, filler words and hesitations were eliminated in the reporting, as they did not add value to the context. Nonetheless, new patterns and themes identified from the data were added; thus the analysis was both deductive and inductive.

The questionnaire and the one-on-one interview as well as the discoveries from the observation guide of the researcher were analyzed side by side to address each research question. The interview session was centered on soliciting in-depth views of the kitchen staff and school authorities in order to make an informed assessment on the relationship between meals provided and the health status of students. The observation was done as a confirmation of all the information gathered from the respondents. The themes that emerged from the interview analysis were combined with the responses of the questionnaire items, authenticated by the observable items were used to address the research questions.

## CHAPTER FOUR

### RESULTS AND DISCUSSION

#### 4.0 Introduction

This chapter presents and discusses the data collected from respondents. The questionnaires and an interview schedule were designed to find out the extent to which school food service impart the health of students in Zabzugu Senior High School. Sessions of observation were also undergone to gather at first hand hygienic conditions pertaining in the school's kitchen and stores. Questionnaire items were analyzed using the frequency distribution tables. The responses of respondents during the interview were also coded and organized into meaningful categories. The verbatim expressions of some respondents were also presented to support and enrich the analysis of the items of the research questionnaire.

#### 4.1 Demographic Characteristics of Respondents

The demographic characteristics of the respondents are presented in table 4.1 below.

Table 4.1 Distribution of Respondents by Sex

Respondents	Sex	Frequency	Percentage
Students	Male	60	60%
	Female	40	40%
	Total	100	100%

Information on this table indicates that out of the 100 respondents 60 representing 60% were male students while 40 representing 40% were female students. This indicates the dominance of male students over their female counterparts in Zabzugu Senior High School.

Table 4.2 Respondents' year group

<b>Respondents</b>	<b>Year</b>	<b>Frequency</b>
Students	First	20
	Second	35
	Third	45
	<b>Total</b>	<b>100</b>

Table 4.2 depicts that priority was given to third year students to respond to the questionnaire than their counterparts in the lower forms. This was evident when 20 students representing 20% of respondents are in first year class; 35 students, representing 35% responded from second year group while 45 students representing 45% are third year students. This was deliberately done to cater for students who can give more accurate information thanks to their longer stay and personal experience in the school.

### **Research Question One**

#### **Meals provided for students at Zabzugu SHS**

The researcher sought to find out what students are normally fed with in this school. The three-square meals, breakfast, lunch and supper are assessed in the following tables (table 4.3, table 4.4 and table 4.5). These tables presented data on the interview item 4 which sought to find out the kind of meals students consume in Zabzugu SHS.

Table 4.3 Breakfast meals provided to students of Zabzugu SHS

Meals	Frequency (per week)
Breakfast: Tea with milk and bread	1
White porridge	2
Broken maize porridge	1
Rice water with milk and bread	1
Tom brown	1
Millet porridge	1
Total	7

Contrary to any possible presumption that some Northern schools could compromise the feeding of students due to government's inability of timely release of feeding grant, was addressed in table 4.3. This table shows that students consume a variety of meals which will help their growth and avoid making them get fed up them.

From the table, it was discovered that only one meal, (white porridge) is provided twice a week. The rest of the meals are provided only once a week. However, it could be observed that only two of the meals provided for breakfast are accompanied with bread while there rest, (millet porridge, white porridge, tom brown porridge and broken maize porridge) are taken without anything to accompany with. These types of meals do not help students to grow very well because they lack a lot of nutrients such as protein found from egg and milk. This data relates to a study carried out in a boarding school in Nigeria to assess the nutritional status of forty students which showed that students in that boarding school were generally malnourished with inadequate energy intake especially among students of younger ages (Akinyemi and Ibraheem, 2009). According to the research, students in boarding schools may be at higher risk of developing nutrient deficiencies compared to those in non-boarding



school, probably due to financial constraints in running boarding facilities. On this note, it is advisable for school authorities to try their best to provide enough food to aid the proper growth of the students.

Table 4.4 Lunch meals provided to students of Zabzugu SHS

<b>Meals</b>	<b>Frequency (per week)</b>
Lunch: Jollof rice and egg	1
Rice with beans stew	1
Gari and beans	2
Yam and palaver sauce	1
Rice and beans jollof	1
Plain rice and groundnut soup	1
<b>Total</b>	<b>7</b>

From the table, one could observe that students are fed mainly with protein rich Ghanaian traditional meals for lunch. Meals are equally varied and rotated once a week except Gari and beans which is provided twice a week. It could also be observed that rice products dominated the list of meals provided. This could either be influenced by the Ghanaian's growing appetite for rice which is gradually becoming a national favorite dish or be blamed as the cause of the growing appetite for rice products among the Ghanaian populace. These data suggest that students would show much enthusiasm towards lunch meals because they are made from rice which is one the most preferred foods in Ghana. The issue of meals rich in protein also confirms the study conducted by Armstrong (1997) which recommends that adolescents should be fed with foods that contain nutrients and ingredients that help build the body, which makes the tissues grow well. According to him, the meals provided for these

adolescent students should contain vitamins and, preferably, first class proteins (meat, fish, eggs, shrimps, crayfish etc.) or second class proteins (beans peas, etc.). This study deviates from that of Olumaikaiye, *et al.* (2010) which suggests that balanced diet is the consumption of palatable food that builds the body irrespective of the nutrients contained in it.

Table 4.5 Supper meals provided to students of Zabzugu SHS

<b>Meals</b>	<b>Frequency (per week)</b>
Supper: Banku with groundnut soup	2
Tuo-Zaafi with groundnut soup/ bra /meat	1
Kenkey with hot pepper and fish	1
Tuo-Zaafi with dry okro groundnut soup	1
Rice balls and groundnut soup	2
<b>Total</b>	<b>7</b>

This table reveals that meals are once again varied for students. Banku with groundnut soup and rice balls with groundnut soup are provided twice a week. Equally there is a blend of meals that were hitherto referred to as the staple food for some tribes on the menu students. For instance, Kenkey with hot pepper with fish meant for the Gas, Banku for Akan tribes and of course, Tuo-Zaafi was also provided as the school is located at the North. Another observation which could be made from the table is the fact that most meals are from fermented products which Marquis, (2007) identified to improve nutritional quality of food as well as reduce bacterial contamination. One typical thing the table illustrated is the fact that all the soups provided were prepared with groundnut. The effect of this type of meals is that students get fed up with them and therefore they normally lost interest in taking them.

Table 4.6 Meals preference among students of Zabzugu SHS

<b>Meals</b>	<b>Frequency (respondents)</b>
Breakfast: Tea with milk and bread	36
White porridge	1
Broken maize porridge	9
Rice water with milk and bread	38
Tom brown	15
Millet porridge	1
Total	100

This table illustrated response on our questionnaire item 8 which sought to find out students' preference of meals provided them. The table shows that students sampled like two main meals, tea with milk and bread (36%) and rice porridge with milk and bread (38%). Apart from these two meals, some respondents, (15% of them) also like tom brown porridge followed by (9%) preference of broken maize porridge. White porridge and millet porridge were the least preferred with only (1%) of our respondents showing some preference for them.

The high preference for the two meals with bread added could be associated with the fact that the bread makes them heavier and makes the meals last longer on the consumers. This desire shown by students suggests that these adolescents need more food for development than the school authority are providing. Consistent with the study conducted by Intiful, F. D. and Lartey, A. (2014), the breakfast meal contributes significantly to the total energy and nutrient intakes of Ghanaian school children. According to Intiful, F. D. and Lartey, A. (2014), the breakfast meal contributes to between 32% and 41.3% of the total daily energy and between 23.4% and 55.7% of the other nutrients.

Consequently, it is probable that without healthy breakfast meal, many of the children would not be able to meet their daily nutrient requirements, due to the difficulty to compensate for energy and nutrients lost in the morning when conscious effort is not made to replace nutrients lost. Encouraging breakfast consumption among Ghanaian school children, Intiful, F. D. and Lartey, A. (2014), concluded that breakfast meal consumption is a way to ensure that they (children) meet their daily nutrient and energy intakes. Therefore, food service providers are entreated to give students nutritious breakfast meals that can enhance their nutritional status.

Another study conducted by Olumaikaiye, *et al.* (2010) on food consumption patterns of Nigerian adolescents in secondary schools and effects on body weight also revealed that the rate of underweight is higher among those who don't take snacks as compared to their counterparts who take snacks twice a day in addition to their three main meals.

Table 4.7 Meals preference among students of Zabzugu SHS

<b>Meals</b>	<b>Frequency (respondents)</b>
Lunch: Jollof rice and egg	37
Rice with beans stew	18
Gari and beans	1
Yam and palaver sauce	17
Rice and beans jollof	25
Plain rice and groundnut soup	2
Total	100

This data presented rather a mixed preference with average preference for more meals. Nevertheless, jollof rice with egg was preferred by the majority (37%) of respondents. Rice

and beans jollof is the next preferred with (25%) of the respondents going for it. Rice with beans stew and yam with palaver sauce had (18%) and (17%) preference respectively. Gari and beans only had (1%) preference. This information suggests that if given the chance, the majority of students sampled would propose the removal of Gari and beans from the menu. Although the meal is rich in protein, carbohydrate vitamin A, etc., students should be consulted on how to improve the meal to enhance their interest in it.

Table 4.8 Meals preference among students of Zabzugu SHS

Meals	Frequency (respondents)
Supper: Banku with groundnut soup	1
Tuo-Zaafi with groundnut soup/ bra /meat	30
Kenkey with hot pepper and fish	60
Tuo-Zaafi with dry okro groundnut soup	3
Rice balls and groundnut soup	6
Total	100

This table also presents information on students' preference of the meals served them for supper. Information from the table shows that out of a sample of 100 students, 60 students representing (60%) prefer kenkey with hot pepper and fish. This rate of preference of kenkey is followed by preference for Tuo-Zaafi with bra groundnut soup and meat. Bra is one of the favorite vegetables among most ethnic groups in the Northern region including Dagombas which is mostly prepared with groundnut soup. No wonder (30%) of the sampled students like Tuo-Zaafi with bra groundnut soup and meat. Tuo-Zaafi was served with a different soup, dry okro groundnut soup, and amazingly, only 3% of respondents prefer it. Rice balls with groundnut soup also had 6% of respondents preferring it while Banku with groundnut

soup being the least preferred meal, only having only 1% of respondents showing preference for it.

All responses collated and summarized from questionnaire item 9 which demands that respondents suggest changes on the menu reveal that:

- Some kind of pastry be added to all breakfast meals to make them last longer because the interval between breakfast and lunch is 6 hours (20 respondents).
- White porridge should be served only once a week (17 respondents).
- Groundnut soup should no longer be prepared all the days of the week but it should be complemented with other soups such as palm nut soup, vegetable soup, etc (25 respondents).
- Gari and beans be reduced to once a week (18 respondents).
- Fish and meat be each served twice a week (9 respondents).
- Plain rice for lunch should be served with stew instead of groundnut soup as ground nut soup again served for supper (11 respondents).

These concerns suggest that students like some meals more than others because of some things that are not provided to make them more attractive to students. On that note, school authorities must consult with student leaders to understand their concerns vis- a- vis the challenges in the provision of school meals.

## **Research Question Two**

### **Meal preparation patterns and hygienic practices**

All the 100 respondents indicated that they consume three-square meal per day. In the same way, all the respondents indicated that they always take breakfast between 8:31am- 9:30am; lunch between 2:01- 3:00pm and supper between 5:00- 5:30pm. The researcher dedicated interview guide 4 and 8 to find out the kinds of meals provided for students.

The school's management and the kitchen staff testified how difficult it is sometimes when their creditors demand for payment of their debts owed them before supplying the school with new stocks. This, they attribute to delays on the part of government in disbursing the Northern schools' feeding grants. However, answering the question *“How do you manage to provide balanced diet when feeding grants are in arrears?”* during an interview with him, the headmaster assured the researcher of provision of good meals to the students. Below is the verbatim explanation of the headmaster.

*“We owe it a duty to provide these young ones the right proportions of nutrients that would aid their growth and cognitive development. You know it is no fault of these young ones that the grants always delay, so we also try our best to pass through thick and thin to feed them well”.*

A careful study of the meals provided for students in Zabzugu SHS show that students take bread twice a week for breakfast. The rest of meals provided for breakfast go with no accompaniment; white porridge, Tom brown and millet porridge are served without anything to eat with. These meals are generally light meals which are taken early within the day until lunch is served after 2:00pm. This explains the low preference of 1% each meals such as white porridge and millet porridge as shown on table 4.6 of the data analysis.

The observation guide 5 and 6, helped to find out whether the school has a planned menu for meals and whether the menu is really followed. The researcher discovered that:

1. There is a planned menu.
2. The menu is not always followed.
3. The changes in the menu occur when a particular day's meal is exchanged with another day's; for instance, Monday's breakfast is exchanged with that of Tuesday.

### **Hygienic Practices in Zabzugu SHS**

The researcher sought to ascertain the realities of pertaining hygienic practices in the school.

### **Hygiene at school's kitchen**

Students were given the chance to assess the hygienic practices by the kitchen staff and responses to questionnaire item 16 presents what they say. Interview guide 1, 2, 3 and 6 gives the chance to the kitchen staff to describe how they practice proper hand washing, cleanliness of the kitchen, store, equipment and the foodstuffs. These same things were also investigated through observation by the researcher with observation guide 1, 2 and 3.

Table 4.9 Cooks hygienic practice at school's kitchen

<b>Respondents</b>	<b>View</b>	<b>Frequency</b>
Students :	Cooks are hygienic	65
	Cooks are not hygienic	13
	Cooks are somehow hygienic	22
Total		100

Questionnaire item 16 was designed to find out how students view the hygienic practices of their cooks. The table depicts that out of the 100 students sampled, 65 of them, representing (65%) are of the view that the cooks are hygienic towards their food service delivery. On other hand, 13 respondents which represent (13%) think that the cooks are not hygienic enough; but 22 students representing (22%) show some moderation in their assessment stating that cooks are somehow hygienic.

Looking at the data provided, one can observe that 35 students, representing 35% have found some faults on the cooks, which when given the chance, they would state without any fear of victimization. The good portion of sampled students, 65% of them gave a positive recommendation on the cooks. Indeed the issue of hygiene corroborates the proposition by Federal Ministry of Education of Nigeria (2006) through its school health education



programme (SHEP), that feeding should take place in the dining room / hall where the meals are served under the supervision of the teachers with the appropriate teaching on health habits.

This data would be best analyzed in tandem with the data from observation guides 1, 2 and 3 on hygienic practices at the school's kitchen in order to reduce all doubts of undue praises or undue condemnation.

### **Measures to ensure food safety at school's kitchen**

Data from our interview items 1, 2, 3 and 6 with kitchen staff and our own observation item 1, 2 and 3 show the following realities that are listed below. These items were designed to find out measures employed to ensure food safety at school's kitchen. The following are the positive assessments on the kitchen staff.

- i. Weekly exercise of sterilizing the kitchen.
- ii. Daily cleaning of knives, other cutting substances, and wiping cloths in the kitchen.
- iii. Routine and compulsory hands washing with soap before touching food
- iv. A practice of covering all meals very well before consumption
- v. Serving only hot meals for students
- vi. Ensuring that only wholesome foodstuffs are prepared for students.
- vii. Cooks are neatly dressed

The following are also the negative assessments on the kitchen staff.

- i. Most of them wash their hands without soap after visiting toilet
- ii. Conversation during times of processing foodstuffs
- iii. Some clean their flams with bare hands
- iv. Cooks don't use hand sanitizers
- v. Cooks don't wear aprons
- vi. Napkins used for wiping utensils are also used by some cooks to clean their sweats.

Looking carefully at these data gathered, it is obvious that generally the kitchen staff and the school's authorities are doing their best to provide safe food for students. Also, students' positive assessment of cooks' hygiene coupled with the positive observations made confirms the good effort that is in place towards safe food delivery. However, the negative observations made at the kitchen confirmed by the 35% negative responses by students on cooks' hygiene, show that the personnel at the kitchen have to inculcate a few more hygienic practices. On the other hand, matron must also step up their education and supervision on hygienic practices among her staff. These findings also confirm the directives from the Centers for Disease Control and Prevention (CDC) Surveillance Report for 1993-1997, which indicates that food borne illnesses can result from either food from unsafe sources, inadequate cooking, improper holding temperatures, contaminated equipment or poor personal hygiene. This perfectly agrees with the call from the Food Safety (General Food Hygiene) Regulations 1995, that if risk cannot be totally eliminated in an eating environment, the displayed food should be covered and protected from contamination. So it is mandatory for food service providers to practice a high level of hygiene without any excuse or negligence if they are committed to the well-being of their consumers.

### **Research question three**

#### **Relationship between the meals served and the health status of students**

This particular question was designed to solicit the views of both students and kitchen staff on how meals impact the health of students.

Table 4.10 Do students suffer from foodborne ailments after consuming dining hall food?

Respondents	Response	Frequency
Boys:	Yes	1
	No	59
Girls	Yes	6
	No	34
Total		100

According to the responses, (59%) of our 60 male respondents have not either personally suffered from any sickness after eating meals at the school or even witnessed any colleague suffering from such issues before. However a male respondent representing (1%) said he has experience such a problem.

On the part of the 40 female respondents, (34%) testified that they have not suffered neither have they witnessed any of their colleagues suffer from any foodborne diseases from the school meals. On the contrary, (6%) said they have experienced such difficulties as a result of eating dining hall food.

With these data, it is possible that there were foodborne ailments in schools but on a rather minimal proportion.

### **Foodborne ailment experienced in Zabzugu SHS**

The questionnaire item 13 is a follow up question to question 12 to find the kind of foodborne ailments that were suffered by students of Zabzugu SHS. The responses are collated and listed below.

1. Loose stools( 1 respondent)
2. Vomiting (2 respondents)
3. Stomach ache (3 respondents)

4. Constipation (1 respondent)

This is the number of respondents (7 respondents) who indicated that they suffered or witnessed a colleague suffering from foodborne ailments as indicated in table 4.10 above.

**Measures adopted by students to contain food related ailments**

The questionnaire item 14 sought to find out measures students normally adopt when they have a suspected case of foodborne ailment.

- *I quickly send the victim to the hospital (1 respondent)*
- *We report to the housemaster or housemistress before sending him or her to the hospital (2 respondents)*
- *We administer first aid drugs from the house nurse (2 respondents).*
- *I take a lot of water and lie down (1 respondent).*
- *I avoid taking that particular meal the next time it is prepared (1 respondent).*

These responses show that some students suffered from foodborne ailments and they take actions to contain the situation each time it occurred. However, some of the steps such as the response (*I take a lot of water and lie down*) made it difficult for the researcher to conclude that the conditions suffered by the students are caused by food contamination or other food related ailments.

Responses gathered on item 7 of our interview guide also revealed that the kitchen staff has never suspected or even received any complaints on a food related ailment but the matron was quick to add that:

*“We cannot deny our own observation that students don’t patronize some of our meals. We interrogated the prefects on such developments and it discovered that those meals such as white porridge and millet porridge make them feel sleepy in class and those same breakfast meals make them hungry earlier than usual. We have never had a situation confirmed from the hospital concerning sickness related to the food we give the students. Though some of the*

*students frequent the hospital which is just a stone throw from, none of those ailments was ever linked to our food.”*

When asked to assess the health of students by their look (interview item 9) and relate it to the kind of meals provided, (interview item 10), the senior housemistress, among other respondents who confirmed that students look very healthy because of the healthy meals they always consume, said comically that:

*Our meals make them so healthy. The tiny boys and girls we normally admit always become young adults by their third year’s stay with us.*

Though one cannot accurately confirm the health status of an individual by his looks but this unscientific assessment which the researcher did also confirmed that students are active and look healthy; at least a glance.

Generally, it was discovered from the study that students in Zabzugu Senior High School are provided a blend of nutritious Ghanaian traditional staples and foreign meals. These meals are prepared under a fairly hygienic condition. There has not been any medically confirmed foodborne ailment in the school though students sometimes blame some sicknesses on the meals they consumed at the school.

## CHAPTER FIVE

### SUMMARY OF FINDINGS, CONCLUSIONS, RECOMMENDATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

#### 5.0 Introduction

The main objective of this study was to investigate the meal preparation pattern for boarding students in Senior High Schools in Ghana. The study also sought to find out the impact of meals provided on the health of students in the school. To achieve these objectives, the questionnaire and the interview guide were used to elicit the views of respondents. In all, 100 students responded to a questionnaire and 12 were interviewed.

The simple random sampling technique was used in selecting the students and the kitchen staff and other members of staff to answer both the questionnaire and the interview. Data collected with the questionnaire were analyzed using percentages and frequency tables whilst the data collected with the interview guide was analyzed based on themes that emerged.

#### 5.1 Summary of Findings.

The research, “the meal preparation pattern of boarding schools and its impacts on the health status of students: a case study on Zabzugu Senior High School” primarily was conducted with the objective of finding out the type of meals served students; its preparation pattern and the kind of hygienic practices adopted at the kitchen and finally assess how those meals impact the health of students. This section of the study would be discussed based on the objectives stated.

#### Meals provided to students

Students were provided three meals per day: breakfast, lunch and supper. Those meals prepared from local Ghanaian and imported foodstuffs. A variety of meals were provided with only one meal (Gari and Beans) was provided twice a week.

Students are happy with a number of the meals provided them. However they have problems with some of the meals. They think that some breakfast meals are too light to take them to lunch period as they are not accompanied with any pastry.

### **Meal preparation patterns and hygienic practices in school kitchen**

Apart from the type of meals provided, the study also examined the preparation pattern of those meals as well as the hygienic conditions under which meals are prepared. From the study, it was discovered that meals were prepared and served at regular intervals as it is in most schools in the country. Also, meals were prepared under the supervision of a qualified caterer, matron and an assistant. A planned menu was followed for the preparation of meals. Nevertheless, meals on the menu were sometimes interchanged in case of unforeseen eventualities such as shortage of some foodstuffs.

Meals were equally prepared under fairly good hygienic environment and condition. That said, it was however discovered that cooks sometimes neglected or were negligent on some basic hygienic practices such as how to avoid wiping sweat with napkins, washing hands with soap after visiting the washroom, use of hand sanitizers etc.

### **Relationship between meals provided and the health status of students**

The last focal point of this study sought the relationship that existed between the meals served and the health status of the students who consume them. This effort was to clear all doubt about whether student's complaint of ill health in the school had anything to do with the meals they consumed on campus or not. Data collected revealed that no case of foodborne

ailment has ever been recorded in the school. Data collected from interview guide 7 revealed that all the students who associated their ailments to the school meals could not have their complaints justified when they are sent to the hospital. Also, the majority of the respondents testified that they have never fallen ill as a result of eating meals from the dining hall neither have ever seen any of their colleagues under such difficulties. Nonetheless, 7% of respondents alleged to have had health problems suspected to be foodborne. Students looked good and were active in going about their activities on campus.

### **Conclusions**

The study was based three major objectives: to examine the meals provided for Zabzugu SHS students; examine meal preparation patterns and the hygienic practices in the school's kitchen and assess the relationship between meals and the health status of students. In view of the findings of this study the following conclusions can be made:

#### **Meals provided to the students**

- On the basis of the findings of this study, it is concluded that assessment of the provision of meals for students identified generally acceptable meals which were preferred by the students. Notwithstanding, there were a few issues with regards to the breakfast being too light could cause dissatisfaction in the students towards the breakfast meals.
- It is also concluded based on the findings that students are equally fed up with groundnut soup which is served with almost every meal for supper.
- It is again concluded that though three meals are provided to students in Zabzugu Senior High School at regular time frames, changes were sometimes made on the menu without prior notice to students. This sometimes made students unhappy.



- **Meal preparation patterns and hygienic practices an school kitchen**
- Meals prepared and served at regular intervals.
- Considering all available data from this study it is concluded that meals were prepared and consumed under a good hygienic atmosphere.
- The kitchen as well as the dining hall was always tidy as a way of preventing food contamination in the school.
- It is however concluded that cooks do not practice personal hygiene and food hygiene to an appreciable standard. They sometimes wipe their sweat with the kitchen napkins and still used them without washing.

#### **Relationship between meals provided and the health status of students**

- It is concluded that as healthy meals are provided for students at regular intervals, students do not suffer ailments related to food consumed at school dining. This translates in their physically healthy and active adolescent life in Zabzugu Senior High School.
- Last but not the least, it is concluded that no foodborne ailment has ever been recorded or confirmed in the school thanks to the prudent hygienic practices adopted towards save and uncontaminated food service delivery in the school.

#### **5.4 Recommendations**

The following recommendations have been made in view of the findings of the study. It is envisaged that when these recommendations are considered and implemented food service delivery in Zabzugu Senior High School as well as students' confidence on school meals would improve. This will in turn influence the educational achievement of these adolescent students.

In view of the problem on hygienic practices identified among the cooks, it is recommended that there should be in service training for cooks on hygiene. This would go a long way to always refresh their memories on the importance of hygiene on health as well as the consequence of its neglect in food service delivery. Participants should be taken through processes of preventing food contamination.

In times when changes would be made the menu due to unforeseen circumstances as indicated in the findings, it is recommended that there should be prior communication to students. This would bring an end to understandings between students and the kitchen staff on issues of changes on the planned menu.

Breakfast meals provided for the students should always be nutritionally rich and they should be accompanied with pastries. This would encourage students to patronize breakfast meals the more.

The school authority should facilitate a compulsory medical examination on students who complain on food related ailments to know their health problems and devise special meals for those who are allergic to some meals.

Meals for supper should be varied so that students do not get fed up with them

### **5.5 Suggestions for Further Research.**

The current study was limited in scope. This is because the study covered only the Zabzugu Senior High School in the Northern Region of Ghana. A replication study could be conducted in other schools of the country to make the results of the study more generalisable.

It is also suggested that studies be conducted in the study area to find out the views of parents on boarding house meals and the health status of their wards who are boarders in Senior High Schools.

Further studies may also be necessary to find out whether provisions brought from home affect students' attitude or preference towards some school meals or not.



## REFERENCES

- Abdul-Karim, N. (2014). Food poisoning kills seven in northern Ghana. Retrieved June 12, 2014, from [citifmonline.com](http://citifmonline.com)
- Akinyemi, O. and Ibraheem, G. (2009). 'Assessment of nutritional status of Queens College students of Lagos State, Nigeria', *Pakistan Journal of Nutrition*, 8:7, 937-939, [online] Available: <http://www.pjbs.org/pjnonline/fin1192.pdf>. (25 August, 2011)
- Allamani, A. (2007). Addiction, risk, and resources. *Subst Use Misuse*. pp. 421-39.
- Amoafu, (2012). 12,000 children in Ghana die annually of malnutrition. Available on GNA, Thursday 20th September, 2012.
- Anthelme, B-S. (1842). *Physiologie du Gout, ou Méditations de Gastronomie Transcendante*. Paris: Charpentier, Libraire-éditeur, 29, rue de seine.
- Antun, J.M., Gustafson, C.M. (2005). Menu analysis: design, merchandising and pricing strategies used by successful restaurants and private clubs. *J. Nutr. Recipe Menu Dev.* 3 (3), 81-101.
- Bandini, LG, Vu D, Must A, Cyr H, Goldberg A, Dietz WH. (1999). Comparison of high-calorie, low-nutrient-dense food consumption among obese and nonobese adolescents. *Obes Res* 7:438- 43.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioural change. *Psychological Review*, 84,191-215.
- Byrd-Bredbenner, C., Maurer Abbot J. (2008). Food choice influencers of mothers of young children. Implications for nutrition educators. *Topics in Clinical Nutrition*, 23(3):198-215.

Caraher M, Coveney J. (2004). Public health nutrition and food policy. *Public Health Nutrition*; 7(5):591-598.

Caraher M, Dixon P, Lang T, Carr-Hill R. (1999). The state of cooking in England: the relationship of cooking skills to food choice. *British Food Journal*; 101(8):590-609.

Colquhoun I, Bunday S. (1981). A lack of essential fatty acids as a possible cause of hyperactivity in children. *Med Hypotheses*; 7(5):673-9.

Cooking practices in the context of an increasingly processed food supply. *Health Education and*

Dayle Hayes. (2014). [Does the current school food fight benefit hungry kids and hard-working nutrition professionals?](#) Retrieved May 19, 2014, from WordPress.com

Elliott, P. Stamler, J. Nichols, R. Dyer, A. R. Stamler, R. Kesteloot, H. & Marmot, M. (1996). Intersalt Revisited: Further Analyses of 24 hour Sodium Excretion and Blood Pressure Within and Across Populations. *British Medical Journal*, 312: 1249–1253.

Engler-Stringer R. (2009). The Domestic foodscapes of young low-income women in Montreal:

Gate & McDaniel. (2004). *Marketing Research Essentials*. 4<sup>th</sup> edition, Hoboken: John Wiley and Sons, Inc.

Gerba, C.P., Rose, J.B., & Haas, C.N. (1996). Sensitive populations: Who is at the greater risk? *International Journal of Food Microbiology*, 30, 113-123.

Ghana Home Economics Association (1990). *Home Economics for Schools*. Accra: Afram Publications.

Gleason P, Suitor C. (2001) *Food for Thought: Children's Diets in the 1990s*. Princeton, NJ.

GNA. (2014). *40 students hospitalized for food poisoning*. Retrieved March 4, 2013, from citifmonline.com

GNA. (2014). *Daboase SHS food poisoning, samples for test*. Retrieved February 2, 2014, from Ghanaweb.com

GNA. (2014). *Eating red meat can cause breast cancer*. Retrieved June 15, 2014, from ghanaweb.com

GNA. (2014). *Food Poisoning at Awudome SHS*. Retrieved June 1, 2014, from Ghanaweb.com

Graham, M.E. (2002). Health beliefs and self-breast examination in black women. *Journal of Cultural Diversity*, 9(2), 49-54.

Hanson, J.A., & Benedict, J.A. (2002). Use of Health Belief Model to examine older adult's food-handling behaviours. *Journal of Nutrition Education*, 34, S25-S30.

Hochbaum, G.M. (1958). Public Participation in Medical Screening Programs: A socio-psychological Study. *Public Health Service Publication No.572, Washington, DC: Government Printing Office*.

Hwang, J., Lorenzon, C.L. (2008). Effective nutrition labeling of restaurant menu and pricing of healthy menu. *J.Foodserv.*19,270–276.

Iglesias, M.P., Guillen, M. J. Y. (2002). The components of total perceived price: an empirical analysis in restaurant services. *J.Foodserv.Bus.Res.*5(1), 1–22.

Intiful, F. D. and Lartey, A. (2014). Breakfast habits among school children in selected communities in the Eastern Region of Ghana. *Ghana Medical Journal*, volume 48, No.2

Jaffe J, Gertler M. (2006). Victual vicissitudes: Consumer deskilling and the (gendered) transformation of food systems. *Agriculture and Human Values*; 23(2):143-162.

Janz, N.K., & Becker, M.H. (1984). The Health Belief Model: A decade later. *Health Education Quarterly*, 11(1), 1-47.

Johansen, Diana. (2007). ["Practical Guide to Nutrition for People Living with HIV"](#), *Canadian Aids Treatment Information Exchange*

Kelly, T.J., Kiefer, N.M., Burdett, K. (2009). A Demand-Based Approach to Menu Pricing, *Cornell Hos.Q.*50(3),383–387.

Kincaid, C.S., Corsun, D.L. (2003). Are consultants blowing smoke? An empirical test of the impact of menu layout on item sales. *Int.J. Contemp. Hosp. Manag.*15(4),226–231.

Kivela, J.J. (2003). Results of a qualitative approach to menu planning using control and experimental groups. *J. Foodserv. Bus. Res.* 6(4),43–65.

Lang T, Caraher M. (2001). Is there a culinary skills transition? Data and debate from the UK about changes in cooking culture. *Journal of the Australian Institute of Home Economics*; 8(2):2-14.

Liebman, B. & Scharet, M. (2001). Defensive Eating: Staying Lean in Fatness World. *Nutrition Action Health Letter*.

Lockyer, T. (2006). Would a restaurant menu item by any other name taste as sweet? *FUI Hosp.Rev.*24(1),21–31.

Lyon P, Colquhoun A, Alexander E. (2003). Deskilling the domestic kitchen: national tragedy or the making of a modern myth? *Food Service Technology*; 3:167-175.

- McCall, M., Lynn, A. (2008). The effects of restaurant menu item description on perceptions of quality, price, and purchase intention. *J.Foodserv. Bus. Res.* 11(4), 439–445.
- Munoz, K.A. Krebs-Smith, S.M. Ballard-Barbash, R. & Cleveland, L.E. (1997). Food Intakes of US Children and Adolescents Compared with Recommendations. *Pediatrics* 100: 323–329.
- Naipaul, S., Parsa, H.G. (2001). Menu price endings that communicate value and quality. *CornellHotel Restaur. Adm.Q.*42(1),26–37.
- Noguchi Memorial Institute for Medical Research (2003). Nutrition of Young Children and others *Ghana Statistical Service*, 28: 53-60 Online: [www.chnet-works.ca](http://www.chnet-works.ca)
- Oti-Mensah, M.A. (2005). *Catering Made Easy*. Accra: Martmag publications. Papalia, E.D. Olds, S.W. & Fieldman, D.R. (2006). *A Child's World: Infancy through Adolescence 9<sup>th</sup>* edition. New York: The McGraw-Hill companies Inc.
- Owusu A., O'Hara Murdock P., Weatherby N.L. (2007). 'Measuring nutritional intake of adolescents in Ghana, West Africa', *International Electronic Journal of Health Education*, 10, 104-113.
- Parcard Lucile Report (2006). Growth and Development. School Age Child Nutrition Children Hospital, Palo Ato. California
- Parsa, H.G., Hu,S. (2004). Price-ending practices and cultural differences in the food service industry: a study of Taiwanese Restaurants. *FoodServ. Technol.* 4, 21–30.
- Peterson, P. E. Jeffrey, D. B. Bridgewater, C. A. & Dawson, B. (1984). How Pro-nutrition Television Programming Affects Children's Dietary Habits. *Developmental Psychology*, 20, 55–63.



Raab, C., Mayer, K., Kim, Y.S., Shoemaker, S. (2009). Price-sensitivity measurement: a tool for restaurant menu pricing. *J. Tourism Hosp. Res.*33, 93–105.

Reynolds, D., Merritt, E.A., Pinckney, S. (2005). Understanding menu psychology: an empirical investigation of menu design and customer response. *Int.J. Hosp. Tourism Adm.*6(1),1–9.

Riddler, Sharon A. (2003). ["Impact of HIV Infection and HAART on Serum Lipids in Men"](#), *Journal of American Medical Association.* (28):4-16.

Rogers, A. & Pilgrim, D. (2003). *Mental Health and Inequality*. Palgrave Macmillan: Basingstoke.

Saba *et al*, (2012). *Emerging Problems in Infectious Diseases*. University for Development Studies, Tamale, Ghana.

Shoemaker, S., (1994). A proposal to improve the overall price value perception of a product line. *J. Restaur. Foodserv. Mark.*1(1),89–101.

Short F. (2003). Domestic cooking skills—what are they? *Journal of the Australian Institute of Home Economics*; 10(3):13-22.

Story, M., Nannery MS, Schwartz MB. (2009) Schools and obesity prevention: creating school environments and policies to promote healthy eating and physical activity. *The Milbank Quarterly*, 87(1):71-100.

Telljohann, K. Symon, C. & Pateman, B. (2004). *Health Education 4<sup>th</sup> edition: Elementary and Middle School Applications*. New York: McGraw-Hill Companies Inc

Tuttle, C. R. (2000). *Healthy Eating for 2- to 5-year-old Children*. Maryland, College Park, MD: Cooperative Extension.

U.S. Department of Agriculture (2000). *Nutrition and Your Health: Dietary Guidelines for Americans*, 5th edition. Washington, DC: U.S. Government Printing Office.

Vanderkooy, P. (2010). Food skills of Waterloo Region adults. Fireside Chat Presentation. 1-20.

Walter, B. (2000). *Sociology and Modern Systems Theory*. Englewood: Cliff New Jersey Printing-Hall.

Wansink, B., Painter, J., VanIttersum, K., (2001). Descriptive menu labels' effect on sales. *Cornell Hotel Restaur. Adm.Q.*42(6),68–72.

Wansink, B., Van Ittersum, K., Painter, J.E. (2005). How descriptive food names bias sensory perceptions in restaurants. *Food Qual. Prefer.*16 (5), 393–400.

Wardlaw, G.M. (2003). *Contemporary Nutrition: Issues and Insight 5<sup>th</sup> edition*. New York: McGraw-Hill Company Inc.

WHO. (2002). *Global strategy of food safety: safer food for better health*. In Saba et al (2012). *Emerging Problems in Infectious Diseases. University for Development Studies, Tamale, Ghana*

## APPENDIX A

UNIVERSITY OF EDUCATION, WINNEBA

SCHOOL OF TECHNOLOGY, KUMASI

### QUESTIONNAIRE FOR BOARDING STUDENTS

The purpose of this research is for academic work only. Respondents are assured that information collected will be held confidential in accordance with the ethics of research.

PROJECT TOPIC: THE MEAL PREPARATION PATTERNS OF BOARDING SCHOOLS AND ITS IMPACTS ON THE HEALTH OF STUDENTS: A CASE STUDY ON ZABZUGU SENIOR HIGH SCHOOL.

Instruction: **Please tick (√) when appropriate**

1. Sex of the student.      Male ( )      Female ( )
2. Year group      First Year ( )      Second Year ( )      Third Year ( )
3. How many times are you fed in a day? .....
4. What is the range of time in which you normally go for breakfast in your school?  
a) 6:30am - 7:30am      b) 7:31am – 8:30am      c) 8:31am – 9:30
5. What is the range of time in which you normally go for lunch in your school?  
a) 12:00- 1:00 pm      b) 1:01pm – 2:00pm      c) 2:01pm – 3:00pm
6. What is the range of time in which you normally go for supper in your school?  
a) 4:30pm – 5:00pm      b) 5:01pm – 5:30pm      c) 5:31pm – 6:00pm
7. Do you like the intervals between each meal?    Yes ( )      No ( )
8. Do you like all the meals provided in your school? Yes ( )      No ( )

9. Give at least one reason for your response to question 8 above

.....

10. Would you like some of the meals on the school's menu changed? Yes ( ) No ( )

11. If Yes, which ones and why

.....

.....

12. Have you or any of your colleagues ever had stomach upset, vomiting or loose stool after eating some of the meals provided? Yes ( ) No ( )

13. If you answered Yes to question 10 above, state what you or your colleagues suffered from .....

14. What do you do as students when someone falls sick after eating dining food?

.....

15. What do you know about hygiene?

.....

.....

16. Do you think that cooks observe good hygienic practices in preparing and serving your meals? Yes ( ) No ( ) Somehow ( )

17. What do you students do to enhance personal hygiene before, during and after eating your meals?

.....

.....

## **APPENDIX B**

UNIVERSITY OF EDUCATION, WINNEBA

SCHOOL OF TECHNOLOGY, KUMASI

PROPOSED INTERVIEW QUESTIONS FOR KITCHEN STAFF AND SOME MEMBERS OF THE SCHOOL'S MANAGEMENT BOARD

1. How often do you sterilize your utensils before using?
2. In which ways do you clean and sanitize the knives, cutting substances, and wiping cloths in the kitchen?
3. How often do you wash your hands before touching food?
4. Which meals do provide for students?
5. Do students like all the meals you provide?
6. Which measures do you employ to prevent cross contamination of ready to eat food in the kitchen?
7. Have you ever suspected or received any complaint from students on a food borne related disease?
8. How do you manage to provide balanced diet when feeding grants are in arrears?
9. How would you assess generally, without any medical report, the health status of your students?
10. Would attribute the health of students to your meals provided?

## **APPENDIX C**

UNIVERSITY OF EDUCATION, WINNEBA

SCHOOL OF TECHNOLOGY, KUMASI

### THE THINGS TO FIND OUT WITH OBSERVATION

1. What do cooks do after visiting the washroom?
2. Do they avoid excessive conversation during cooking and serving food?
3. How clean are equipment, kitchen, store and the workers themselves?
4. Do students also practice hygiene before, during and after eating? Eg. Wash cutlery, plates, cups, etc.
5. Which meals do they provide for the students at breakfast, lunch and super?
6. Do the meals provided correspond with the menu?
7. Do students look healthy?