

Assessment of Food Safety Practices in the Selected Second Cycle Boarding Institutions within Kumasi Metropolis of Ghana

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Abstract – Food safety is a scientific discipline describing handling, preparation, and storage of food in ways that prevent food borne illness. This includes a number of routines that should be followed to avoid potentially severe health hazards. Food can transmit disease from person to person as well as serve as a growth medium for bacteria that can cause food poisoning. The study investigated food safety practices in second boarding schools in the Kumasi metropolis. Three categories of people were contacted for the collection of data for the research. These comprised of one hundred (100) kitchen Staff, two hundred (200) students and fifty (50) teachers. The researchers used descriptive cross sectional design for the study. Written questionnaire and interview guide were used to collect data from respondents. Also the researcher conducted an observation to confirm the data collected. Simple random sampling, purposive sampling and systematic sampling were employed in the study and the data was descriptively presented into figures. The study revealed that as much as 42% kitchen staff were not medically screened before employment and 62% of those with health certificates had never renewed them. Students and teachers did like the appearance of the kitchen Staff, especially, the pantry men who always sweaty and gave bad body odour. The researchers Observation also revealed that there were no provisions made for hand washing in the kitchens and that one cook used bare hands to blow the nose without washing the hands before handling food. The study recommended that Ghana education service and stakeholders should screen new recruits and have their health certificates issued before they are employed in the schools, and also from time to time health officers should take unexpected inspections to find out those without certificates.

Keywords: food safety, hygienic practices, kitchen Staff, Food Handler, Meat Storage

Introduction

The global incidence of food borne disease is difficult to estimate, but it has been reported that in 2005 alone 1.8 million people died from diarrhoea diseases [1]. An extraordinary extent of these cases can be ascribed to pollution of nourishment and drinking water. Moreover, looseness of the bowels is a noteworthy reason for unhealthiness in newborn children and youthful kids. In industrialized nations, the level of the populace experiencing sustenance borne sicknesses every year has been accounted for to be up to 30%. In the United States of America (USA), for instance, around 76 million instances of sustenance borne infections, bringing about 325,000 hospitalizations and 5,000 passings, are evaluated to happen every year [1].

While less very much reported, creating nations endure the worst part of the issue because of the nearness of a wide scope of nourishment borne sicknesses, including those brought about by parasites. The high prevalence of diarrhoea diseases in many developing countries suggests major underlying food safety problems. Most food borne diseases are sporadic and often not reported, food borne disease outbreaks on the other hand may take on massive proportions. In 1994, an outbreak of *salmonellosis* due to contaminated ice cream occurred in the USA, affecting as many as 224,000 persons. In 1988, an occurrence of Hepatitis A, resultant from the eating of polluted clams, affected some 300,000 individuals in China [1].

In Ghana for instance, the Food and Drugs Board (FDB) Report of 2006 shows that 90,692 people died from food and personal hygiene-related illnesses in the country. Throughout the same period, a projected 297,104 people were documented as having reported at the various Out-Patients Departments of clinics and hospitals with

food and hygiene-related cases. It has been estimated that 1 in 40 Ghanaians suffer each year from serious food borne disease [2].

This worrying situation poses a big problem in the boarding schools. There have been several reported cases of outbreak of food borne illnesses in schools both locally and internationally where schools affected have to be closed down. In the United States of America, more than 600 food borne disease outbreaks in schools were reported to Centre for Disease Control and Prevention (CDC), between 1973 and 1997. These outbreaks resulted in nearly 50 000 illnesses, over 1500 hospitalizations and 1 death. This represents about 5% of all food borne disease outbreaks and 12% of all outbreak-associated cases reported to CDC.

In Ghana, there have been reported cases of food poisoning recently. For instance, dozens of pupils from two basic schools in Madina namely Queen of Peace RC and SDA Primary Schools were admitted in various hospitals for food poisoning after eating rice balls and groundnut soup at their respective schools [3]. There had also been reported case of food poisoning at Archbishop Porter Girls Senior High School. A team of health experts from the Noguchi Memorial Institute for Medical Research (NMIMR) had been deployed to test samples of food, vomit and stool of victims of suspected food poisoning. Twelve students of Teshie southern cluster of schools have been hospitalized after reacting to food bought at school. Speaking to Joy News, a teacher at the school said the students, all at Junior High School, were treated at Lekma Hospital at Teshie. What is encouraging is that food poison is 100% preventable according to WHO report. If food handlers both on the street and in the boarding schools adhere strictly to the food safety practice.

Literature review

Definitions of Food

Food is anything solid or liquid that when eaten and digested promotes growth, repair worn-out tissues, provides heat and energy, fight against diseases and infection and regulates the body processes [4]. The means that anything you eat to give energy or to promote growth or to protect your body against disease is food. According to Medical Dictionary, food is defined as any substance eaten to provide nutritional support for the body.

Food is also defined as any substance or materials that are consumed to provide nutritional support for the body or for pleasure. It is ordinarily of plant or creature source, and contains basic supplements, for example, sugars, fats, proteins, nutrients, or minerals. It is ingested and absorbed by a living being to deliver vitality, animate development, and look after life.

Food could also be defined as any substance consumed to provide nutritional support for the body. It usually of plant or animal origin and contains essential nutrients such as carbohydrates, fat, protein, vitamins or minerals. The substance is ingested by an organism and assimilated by the organism's cells in an effort to produce energy, maintain life, and/ or stimulate growth.

Traditionally, people got food from hunting and gathering, farming, ranching, and fishing, referred to as agriculture. Today, most of the food energy consumed by the world population is supplied by the food industry operated by multinational corporations using intensive farming and industrial agricultural methods.

Nourishment wellbeing and sustenance security are observed by offices, for example, the International Association for Food Protection, World Resources Institute, World Food Program, Food and Agriculture Organization, and International Food Information Council. They address issues, for example, maintainability, organic assorted variety, environmental change, nourishing financial matters, populace development, water supply, and access to sustenance.

The right to food is a human right derived from the International Covenant on Economic, Social and Cultural Rights (ICESCR), recognizing the "right to an adequate standard of living, including adequate food", as well as the "fundamental right to be free from hunger". According to [5], even as we have that right to food, it should be from a safe source and received from sources that have quality assurance and safety.

The Food Handler

Food handler is any person employed in food establishment, whether that person is an employer, employee or other neutral person who handles, stores, transport, prepares, manufactures, serves or sells food, or who comes in contact with eating or cooking utensils or other equipment used in the handling, preparation, manufacture, service or sale of food. According to a study conducted by [6], food handlers are the major threat to public health, from

primary stage until the serving stage of the food production. They stressed that personal hygiene practice of the food service operators is the most important factor to be looked at the management.

Boarding Schools in Ghana

In Ghana, the boarding schools are run similar to other countries. The second cycle schools have three terms a year, approximately twelve weeks each, with few days' mid-term holidays during which pupils are expected to go home away from school. There may be at least three exeats within each term; however, this depends on a particular school. All government Boarding Schools have kitchens which cater for the feeding of the students. Breakfast, lunch and supper are provided for the students which are partly funded by the government. Due to accommodation problems, most students' commutes from home to school every day, these students are known as the day students; however, the Day students have different and perhaps unfavorable view of the day system, as compared to students who are in the boarding house. In some cases, day students feel, they are treated as second-class students by the boarding students, and the school authorities, as most of the time all attention is shifted onto the "Boarders" because they stay on the school compound.

Ideal conditions under which food is prepared

There are several systems which have been developed for food handlers to control food safety problems. One of such systems is hazard analysis and critical control point (HACCP). [7] defines HACCP as an effective systems based on Good Manufacturing Practices (GMP) and Standard Sanitation Procedures (SSOP), for providing safe and healthy foods. This is an effective system because this food safety system is designed to provide the information flow for preventive and corrective actions and can easily be established on production ranks of all varieties of nourishments [8].

Hazard analysis identifies all factors that could lead to hazard for the consumers; all ingredient, stages in the processing of food, environmental features and human factors that could lead to unsafe food being served.

Critical Control Points (CCPs) are the points at which control is essential to ensure that potential hazards do not actually become hazardous. Putting such systems in place is very important, if not to eliminate, at least to minimize the intake of unsafe foods, because it may be very difficult to distinguish between contaminated food and safe food, since the most succulent, mouthwatering dish into which has gone all the skills and art of the world best chef using the possible ingredients, may look, taste and smell superb, yet be unsafe, even dangerous to eat because of harmful bacteria [9].

Good Hygiene Practices

Any establishment with good hygiene practices in place is ideal place for preparation and serving of food. This is because cross contamination is one of the most common causes of food poisoning. It happens when harmful bacteria are spread onto food from other food, surfaces, hands or equipment. A study conducted in Malaysian boarding schools' dining halls found the existence of *Escherichia coli*, *Staphylococcus aureus*, *Bacillus cereus* and *Salmonella* among 3,500 food samples taken through the total plate count procedure [10]. It is vital for staff to follow good personal hygiene practices to help prevent microorganisms from spreading to food, for instance food handlers with cuts and wounds should not be allowed to enter the food preparation area. Microorganisms are to be found in our body and can be transferred onto anything with which the body comes into contact with. Other contributing factors such as mannerism and smoking can contaminate hands and the possibility of transferring the microorganism to food is high [6] and [11]. For this reason, personal cleanliness is essential to prevent these microorganisms from getting onto food. This means good hygiene habits including bathing, washing and tiding of hair, wearing clean clothing and frequent hand washing is important. A food employees' fingers may be contaminated with saliva during eating or smoking. Saliva, sweat, and other body fluids can contaminate food if it comes into contact. Supervisors should enforce rules against eating, chewing gum and smoking in food preparation, service and dish washing areas [12].

Hair should always be washed regularly and kept covered where food is being handled. Hair that is not cared for is likely to come out or shed dandruff, which may fall onto food. Man's hair should be kept short; woman's hair can be covered as much as possible. The hair should never be scratched, combed or touched in the kitchen, as microorganisms could be transferred via the hands to the food [12].

Meat Storage

Ideally meat should be stored at a low temperature to help preserve its quality and prevent the growth of illness causing bacteria. Chilling meat below 40°F is recommended. Meat can be chilled or frozen. Meat could be stored in the refrigerator for a short period of time, only cured meat could be store for up to 60 days in the refrigerator, however, freezing is the excellent way to store meat for longer period of time. The [13] recommends that, frozen items should be below -10 0c; this allows the meat to maintain most of its physical properties, taste, texture, smell and nutritive properties. Small amount of nutrients are lost when thawing. (Salt, protein, peptides, amino acids and water-soluble vitamins) will be lost as drip when the meats are thawed [13]. [14], stresses that this type of food storage should be properly wrapped with plastic or aluminum foil.

Thawing Meat

According to a study that was conducted by the University of Illinois Extension, Centre for Animal Science, three safe ways of thawing meat was identified, that is in the refrigerator, in cold water and in the microwave, these same ways of thawing was also suggested by [15]. The university's extension center revealed that, freezing meat keeps bacteria in a dormant stage, however, once thawed, the bacteria present before freezing can be active again. This study also confirms that; meat should never be thawed in either hot water or on the counter. The study further reveals that, refrigeration, cold water and microwave thawing are the safest way to thaw meat.

Health Requirements of Food Vending Personnel

Food vending personnel always deals with guests therefore the image they project can say a lot about the way their establishment operates. As the saying goes first impression always carries a heavy signal about a person or an establishment as a whole. In this case the one who serves the food, probably the first person a guest or a student will see is extremely important and could give a professional and efficient impression or a very wrong impression about their establishment. All food handlers are expected to have a form of education, [16] screened medically and obtain health certificate. Therefore, there is the need for a definite requirement as far as health issues are concerned to guide the recruitment of personnel's in vending of food.

Kitchen Hygiene

Kitchen hygiene involves the cleanliness of work areas, all equipment and tools, the entire kitchen including walls and floors. Kitchen tidiness, when things are arranged in an orderly fashion, helps prevent accidents. Floors have to be wiped as soon as water spills on it, [17]. Peels have to be dropped into the bin nets instead of floor. Trap doors with net must be used to prevent flies. Pest and rodents that spoil and infect food are only kept away when kitchen sanitation is good [18].

There are a number of cloths that are used in the kitchen during food preparations and such clothes have to be always kept clean and neat, as food handlers have the responsibility of wearing suitable protective clothing, [19].

Cleaning the Kitchen

Cleaning a kitchen requires lots of extra attention. This is because the kitchen is where the food is. It is where food is cooked, stored and at times eaten. It is also one of the rooms in the house with lots of traffic, which means a lot more cleaning. In cleaning all cleaning supplies needed for cleaning has to be gathered in a container or basket. Hand- gloves has to be worn to protect the hands and if possible natural cleaning protects must be used instead of chemical which can damage the skin. According to [20], dirty equipment is one of the sources of contaminations. Therefore, the effective equipment cleaning program should be applied. During cleaning sessions, the large fixed equipment and all surfaces within the kitchen has to be cleaned first, followed by the ceiling, walls and cabinets, whiles cleaning these items dusters must be dumped after which the floor should be thoroughly cleaned.

Materials and methods

Research Design

The researcher used descriptive cross sectional design which was school based. Usually descriptive design gives a picture of a situation and exposes the nature of a phenomenon. The descriptive design requires organization and presentation of data systematically in order to arrive at accurate and valid conclusions. Quantitative method was adopted for the study. Quantitative descriptive research uses quantitative method in describing, recording, analyzing and interpreting conditions that exist. In quantitative studies all aspect of the study is carefully designed by the researchers before they actually collect any data.

Data Collection Techniques

The data collection techniques refer to methods of obtaining information (data) about a group of people. It is classified in many ways. The researcher used more than one data collection technique. This was because various categories of people participated in the study. Written questionnaire was adopted as a technique for the study. This is due to the fact that cross sections of the respondents were literates and therefore could respond to the questionnaire by themselves. The questionnaire was developed by the researchers and it was under five main topics namely: demographic characteristics, health status, condition under which food is prepared, condition for serving food and unhygienic practices. The researcher visited 10 selected schools where selected teachers and students were arranged to respond to the questionnaire. It was self-administered. The researchers also used interview to enable her gather data from the section of study population who found it challenging to read and write. The researchers used interview method on the kitchen staff mainly in the selected schools. The interview section was on one- on –one basis. Apart from the above mentioned data collection techniques, the researchers also used observation method for collecting data. The researchers visited the kitchen of the selected schools to observe conditions under which food is prepared and served.

Data Collection Tools

The data collection tools the researcher used for the study include questionnaire, interview guide and digital camera.

The questionnaire was developed by the researcher. It was pre tested to meet the requirement for validity and reliability.

Study Population

The study population constitutes the kitchen staff of second cycle boarding institutions in Kumasi metropolis, Ashanti Region, the teaching staff as well as the students.

Sample Size and Sample Techniques

The sample size for the study was 350 people, out of this 100 people were selected from kitchen staff of the selected institutions, 50 teachers were selected and for students, 200 of them were selected. For the selection of the members of the study units, multistage sampling techniques was applied which comprised of simple random sampling, purposive sampling and systematic sampling. The schools which form the study unit were selected by the simple random sampling. The names of the second cycle schools in Kumasi Metropolitan were written on the pieces of paper and all of them were put in basket. By the use of lottery method, the 10 schools were selected. For each selected school, 10 kitchen staff was selected for the study, 5 teachers were selected and for the students 20 of them were selected for the study. Purposive sampling was also used to select key informant who were specialist on the subject matter. Systematic sampling method was used to select students who participated in the studies. It was convenient because the students were seated in the classroom and on roll. The researcher selects number one (1) as a random start and at interval of five.

Pre Testing

The survey instruments (interview guide and questionnaire) were pre tested in two schools which were not selected for the actual study. The purpose was to modify the guide and the questionnaire to make it respondent friendly.

Data Handling and Analysis

For proper handling of data gathered, research assistants were recruited to be responsible for checking the completeness and accuracy of the data, numbering the questionnaires serially and sequentially before storing.

Ethical Consideration

Ethical clearance for the research was obtained from the University authorities and Ashanti Regional directorate of education. In the Metropolis and school levels, both written and oral consent were sought before the project was embarked upon.

Analysis and discussion Background Information

The researcher investigated the background characteristics of the respondents. It was revealed that kitchen staffs who were 41 years and over consisted of 32% of the total number, 28% of them were in ages between 36 and 40 years, 18% were in ages between 31 and 35 years, 16% of them were in ages 26 and 30 years, and 6% of the respondents were in ages 20 and 25 years.

Educational Level

In the case of educational level, 30% of the Kitchen Staff indicated that they had never been to school. From the primary level and above, 70% of the kitchen staff has been to school, as can be seen in Fig. 1.

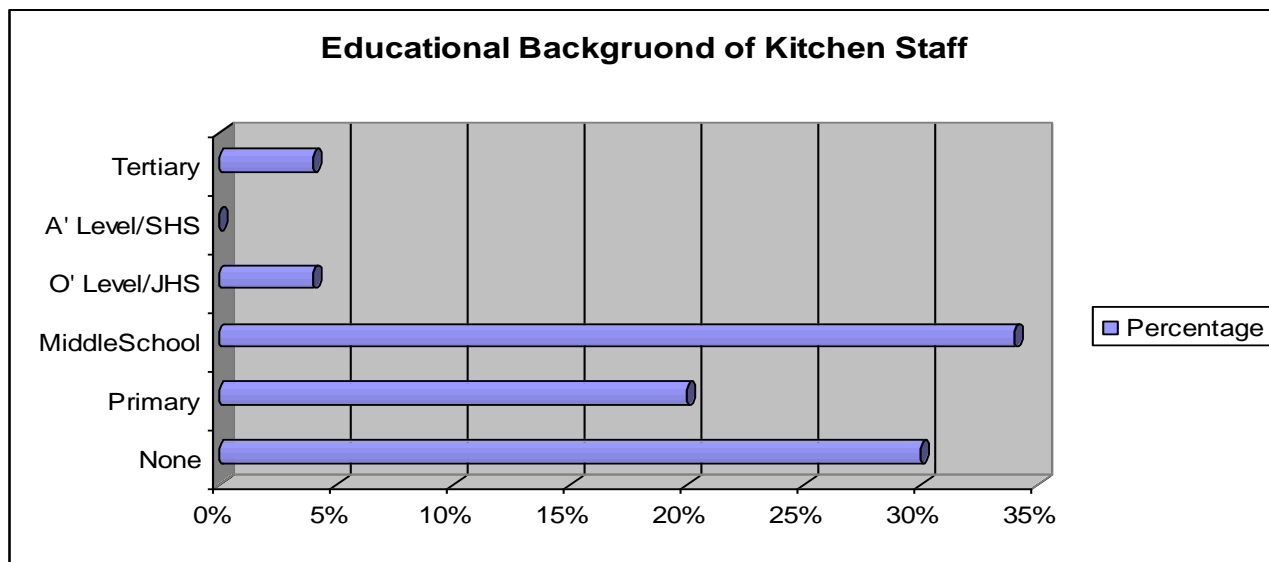
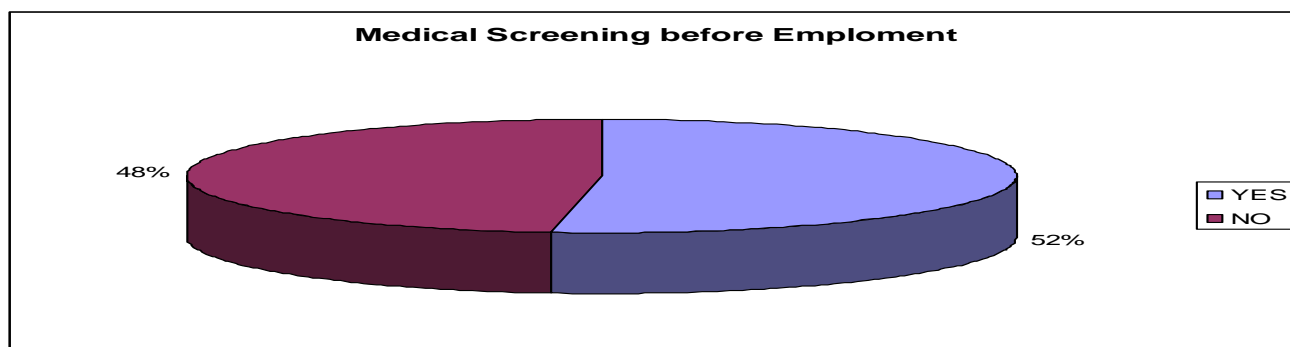


Figure 1. Educational Level of the Kitchen staff
Source: Field Data, 2011

30% of the Kitchen Staff indicated that they had never been to school. From the primary level and above, 70% of the kitchen staffs have been to school. The 30 percent who had not been to school is not consistent with what [16], said, to him every food handler should possessed, knowledge, skills both technical and culinary and the ability to explain and demonstrate that he or she can perform the essential functions of the job with or without reasonable supervision, using some other combination of skills and ability. Contrary to this, a study that was conducted in Nigerian’s South Eastern Metropolis, on the knowledge, attitude and practices of food handlers in food sanitation, for the Public Health and Community Medicine Papers 2011, there was no significant difference in attitude and practice between trained and untrained food handler [20].

Medical Screening before Employment

The kitchen staffs from the selected second cycle institutions were asked if they were medically screened before employment. Fig. 6 shows that 52% respondents were screened whiles 48% were not screened before employment. Refer to fig. 6 below for the detailed results.



Source: Field Data, 2011

Fig. 2: Medical Screening before Employment

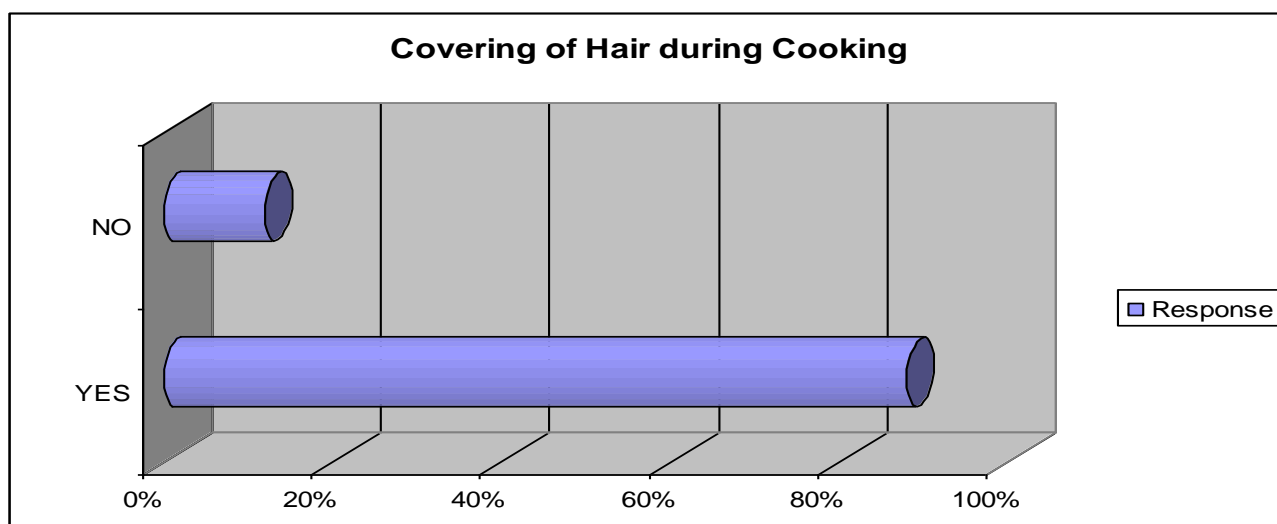
The findings from the survey revealed that 58% of the kitchen staff were screened medically before they were recruited/employed. As much as 42% of the respondents were not medically screened before recruitment. They could present a serious problem as one cannot be sure if the food handler carries any communicable/contagious disease which could easily be transmitted to colleague workers and more importantly to the students. This is against standards. In consistent with Indiana, medical screening and certification is required before one can handle food [21]. Another study that was conducted in Malasia, UiTM on food borne Illness Risk Factors Assessment indicated that, typhoid immunization proof (certificate) is required before one could enter the food preparation area [22].

Out of the 52% of respondents who indicated that they were screened and issued health certificate before employment, 62% indicated they have not renewed their health certificate after it was issued. This is not acceptable; Health certificate is subject to renewal annually. Refusal to renew health certificate is against the regulation that governs the caterers, cooks, food vendor among others. Miss Appiah the District coordinator of schools Health Education programme (SHEP), of Fantekwa District Directorate of Education in Eastern Region, one time expressed regret that, about 90 per cent of the food handlers in the district operate in schools without health certificates. The kitchen staff by law is to first of all acquire the health certificate and renew it annually. The responsibility lies on the District/Municipal environmental health directorate to ensure that the said groups of people are screened and health certificate issue to them.

The researcher investigated to know why the respondents failed to renew the health certificate. The reasons given included: *I don't know where to renew the health certificate, the officer responsible did not come to our place, I'm now going to renew it, I don't know where to go and renew it.* These were some of the reasons given for the refusal to renew the health certificate. This suggests that, the kitchen staff must be given much education on the importance of acquiring health certificate and renewing it annually. It also means that the implementing agencies must be proactive and responsible.

Covering of Hair during cooking

The respondents were asked whether they cover their hair during cooking. Fig. 1 indicates, 88% respondents covered their hair during cooking, while 12% indicated that they do not.



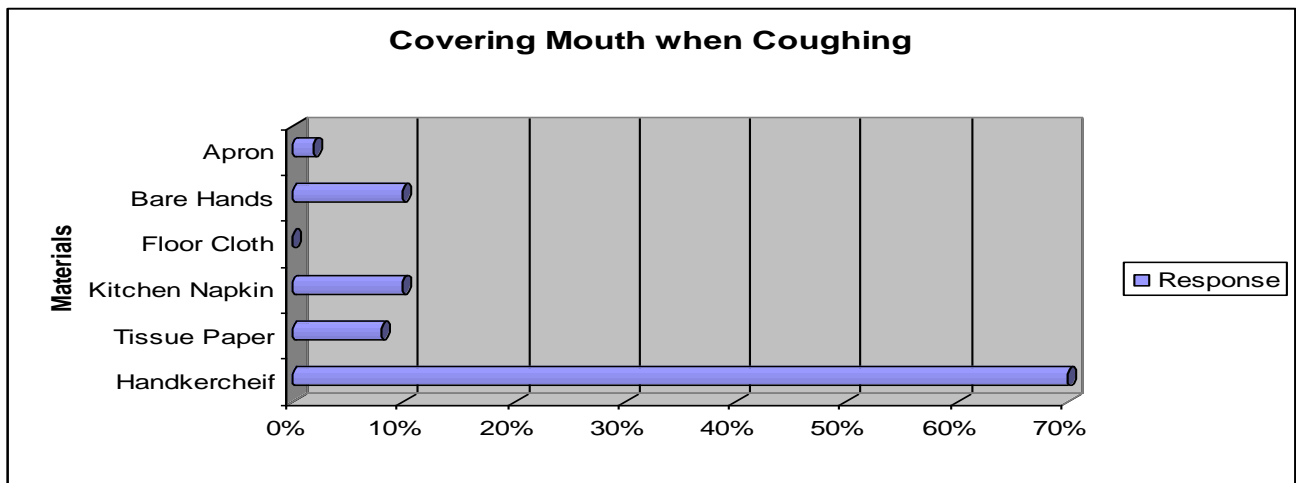
Source: Field data, 2011

Fig. 3: Covering of Hair during Cooking

Eighty-eight percent (88%) of the respondents indicated that they covered their hair during cooking. This

conforms to the regulation regarding personnel hygiene. The hair of the personnel handling food should be washed regularly, and kept covered when food is being handled. The hair that is not cared for is likely to come out or shed dandruff which may fall into the food according to [24]. The means that education still has to go on because 12% of the respondents said they do not cover their hair during cooking in consistent with this [4] indicated that hair must be covered with a cap, net or scarf. On the contrary upon the researcher's observation, it was found out that, more than half of the kitchen staffs do not cover their hair which is more than the 12% indicated by the respondents. Based on the interaction the researcher had with the kitchen staffs it was realized that, the food handlers do not know the implication of not covering the hair, this means an intervention program could help to deal with such situations, as in consistent with what happened in Delhi, in India where after providing health education program in food and personal hygiene to food handlers there was change in knowledge, attitudes, and self -reported hand-washing practices [25].

Covering mouth when coughing



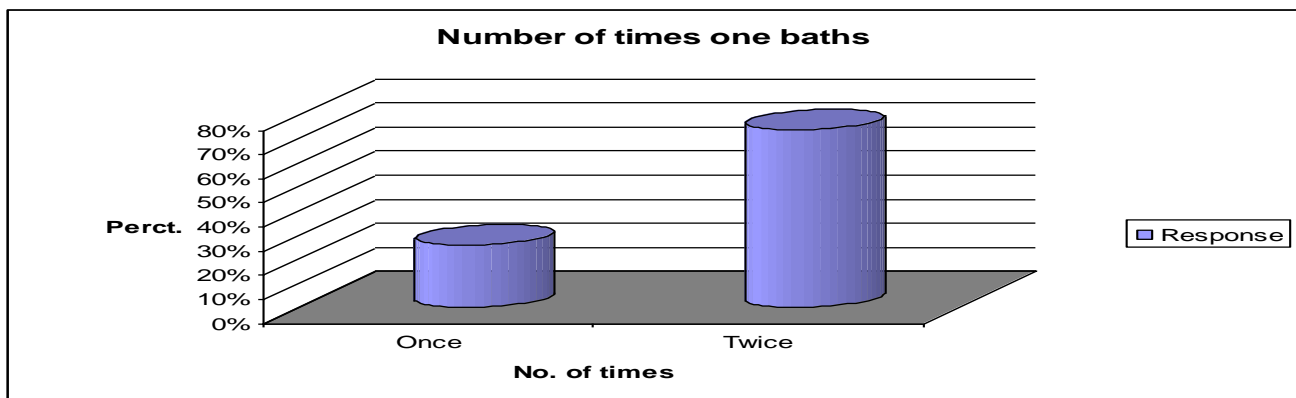
Source: Field Data, 2010

Fig. 4: Covering the mouth when coughing

A question was asked regarding, covering of mouth when coughing, sneezing or yawning. All of the respondents revealed that the mouth is covered. Among the respondents, 70% of them stated that the use handkerchief to cover their mouth. For the usage of disposable tissue paper, only 8% of the indicated that. The responses for the remaining 22% were quite serious, bare hands and others. This particularly showed how ignorant they were about the hygienic practices at the kitchen. Ten (10%) of the kitchen staffs said they used kitchen napkin to cover their mouth, the other 10% and 2% responded that bare hands and apron are used respectively to cover their mouth.

Number of times one baths

In response to number of times one takes his/her bath a day, 74% of the kitchen staff stated that they bath twice a day as can be seen in fig.5



Source: Field Data, 2011

Fig.5: Number of times one baths

The researchers were interested in the number of times respondents bath a day. Seventy-four percent (74%) of them responded they bath twice a day, with 26% of them indicated that they bath once day. Personal cleanliness is very essential regarding food handlers, this because germs and bacteria are found in and on the body and can be transferred unto anything with which the body comes into contact with as stated in literature. For this reason, a person who is not clean, according to the regulation should not handle food, in consistent with this [23] stated that, *Staphylococcus aureus*, *Salmonella* and *Clostridium perfringes* may all be carried by personnel involved in food preparation. In this case, it is essential to bath or shower every day at least two times otherwise microbes can be transferred onto clothes and to food, particularly in warm weather [24], this is in consistent with [4], who indicated that food hand les should bath regularly, at least twice in a day. The kitchen staff who responded that they bath once a day whether before or after work, needs to be educated to at least bath before starting duties and also after duties to enhance their level of cleanliness as in literature.

Special cleaning of kitchen

The respondents were asked the number of times the kitchen was specially cleaned, 90% of them did indicate that the kitchen was specially cleaned once a week. 10% of them also said it was cleaned twice a week. For the cleaning of the dining hall, 94% of the kitchen staff did indicate that the dining hall is specially cleaned once a week, 6% of them did say that the dining hall is cleaned once a month.

The researchers wanted to find out how often is the dining table cleaned. 136 students representing 68% revealed that the dining tables were cleaned after every meal. The teachers 20 (40%) showed that dining tables are cleaned after every meal. Again, 19% of the students indicated that the dining hall was cleaned at the end of the day, 60% of the teachers revealed that it was cleaned at the end of the day.

Students and teachers were asked to describe the kitchen floor, the response from students 39% were that the kitchen floor has cracked. 28% of the teachers stated that the kitchen floor was cracked. With the same question asked, 33% of students and 28% of teachers indicated that the kitchen floor was wet. Students (29%) and teachers (32%) did say that the kitchen floor was soiled. Students (8%) indicated that the floor was sandy, whiles 4% of teachers revealed that floor was sandy. The detailed results are presented in the fig. 6.

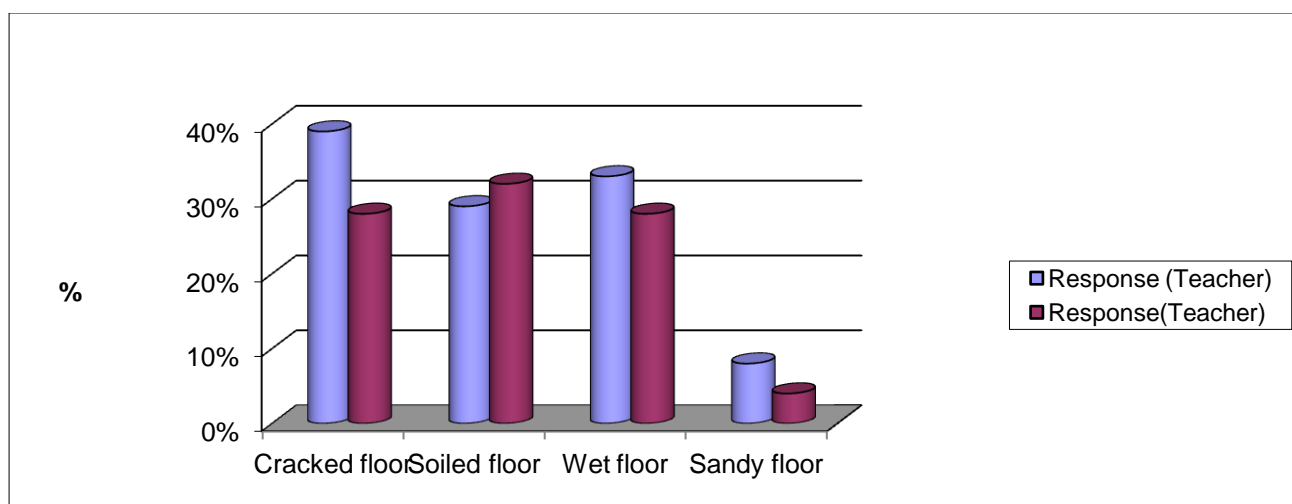


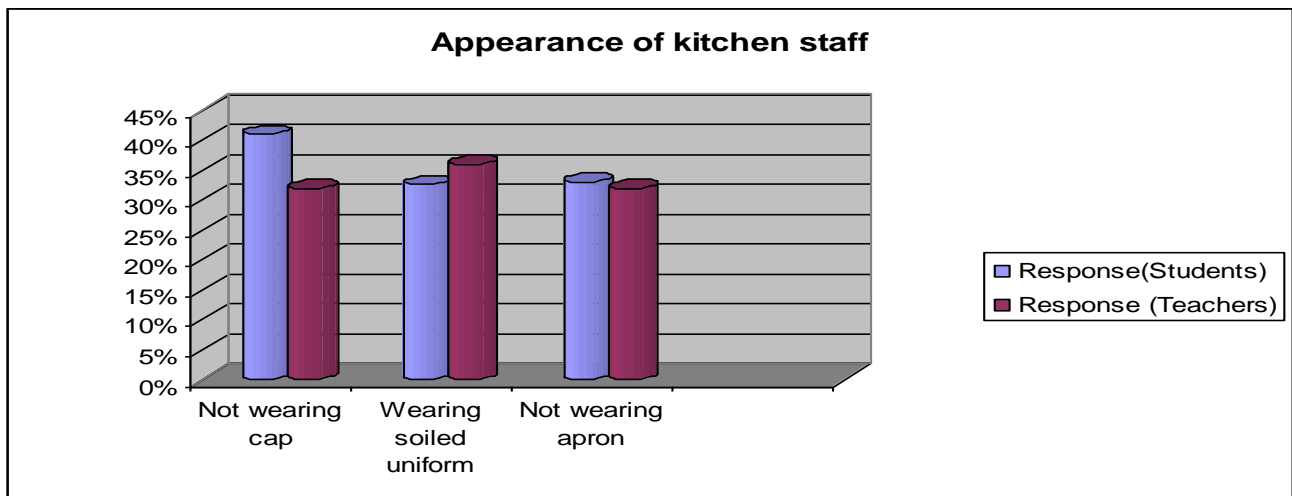
Fig.6: Description of kitchen floor (*Respondents were allowed to make more than one choice)

Source: Field data, 2011

Description of appearance of the kitchen staff

Both students and teachers were given the opportunity to describe the appearance of the Kitchen staff. Seventy

eight (78) students representing 41% of the total number did indicate that the kitchen staff do not wear cap during cooking. For the teacher, sixteen (16) of them representing 32% did say that kitchen staff do not wear cap. Again, 32.6% of students and 36% of teachers indicated the kitchen staff wore soiled uniform as can be seen in fig. 7



Source: Field data, 2011 (*Respondents were allowed to make more than choice)
 Fig 7 Description of appearance of kitchen staff

Students 73% indicated that talking into food during preparation and serving is one of the unhygienic practices undertaken by the kitchen staff. Correspond with teachers, 40% did indicate that. Students 38% and teacher 60% indicated that the kitchen staff, tasted food with their hands. Again 16% of students and 8% of teachers indicated they sneezed into the food. Students (24%) and teachers (24%) revealed that the kitchen staff scratched their bodies when preparing and serving food. Detailed results are presented in Fig 8.

Unhygienic practices by the kitchen staff

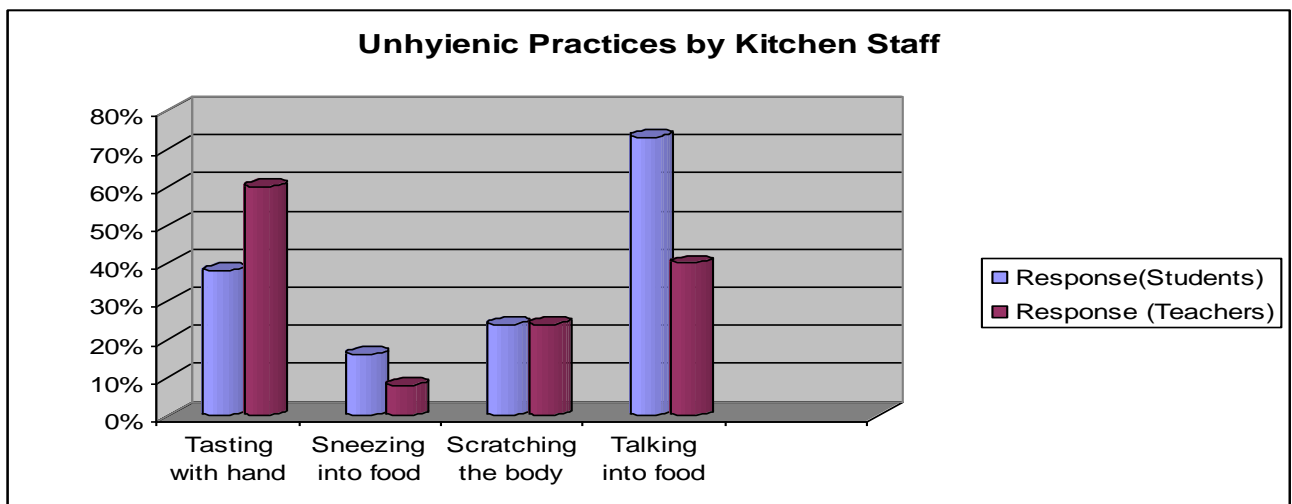


Fig.8 Unhygienic practices by the kitchen staff Source: Field data, 2011(*Respondents were allowed to make more than choice)

In response to the question, have you ever kept dining hall food and eaten the next day, 70 of the students representing 35% responded they ever kept dining hall food and eaten the following day. 130 (65%) students stated they had not kept food and eaten the following day. Only 4 (5.7%) of students, have ever heated leftover food before eating. As much of 66 (94.3%) of students did not heat the leftover food before eating.

Responding to the question where students keep their plates and cups before dining sessions, (68%) of the students stated that, they kept their plate/cup in the dormitory. 65% also indicated that they kept their plate/cup at the pantry.

Conclusion

With increasing reported cases of food poisoning in our second cycle boarding schools, in Ghana, there is the need to determine the health status of all employees who handle food in the various school kitchens and also to discourage any negative hygienic practices which can cause transmission of food borne illness. The food and drugs board and the rest of law enforcement agencies must be up and doing to sustain the sensitization and other programs that will help improve the situation.

Recommendations

- i. The government should improve the working conditions of environmental health inspectors and encourage them to carry out more rigorous inspections to ensure every food handler is medically screened before handling food. Also those who are already in the business without health certificates must be screened medically and issued health certificates, and the authorities must ensure that renewal is done annually.
- ii. Education seminars and talks on food borne illness or disease has to be organized for the kitchen staffs in the Kumasi metropolis on a quality basis, for the food handlers to have more insight on the dangers involved in consuming contaminated foods which have the potential to cause food borne illness.
- iii. New recruits must be screened and be issued health certificate before they are employed in the schools, and also from time to time health officers should take an unexpected inspections to find out those without certificates.

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