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Exploring Knowledge, Attitudes and Practices towards Food Hygiene by Hospitality Students in Ghana

Paulina Nillie Adzoyi [1]* Ben Quarshie Honyenuga [2]

[1] Faculty of Applied Sciences & Technology, Ho Polytechnic, P.O. Box, HP 217, Ho- Ghana

[2] Faculty of Business & Management Studies, Ho Polytechnic, P.O. Box, HP 217, Ho- Ghana

*E-mail of corresponding author: heladzoyi@yahoo.com

Abstract

There have been several reports of outbreaks of food poisoning in Ghana in recent times. Most of these outbreaks were attributed to non-adherence to hygiene practices by employees of the hospitality industry. It is argued that, employees of the industry do not practice food hygiene because either they have little or no training in food hygiene or because of work pressures, lack of equipment and supervision at the work place. Most of these studies have concentrated on employees in the hospitality industry and leaving out hospitality students who are future employees in the industry. The purpose of this study therefore was to explore food hygiene knowledge, practices and attitudes regarding handling of leftover foods, cross contamination and personal hygiene, by first year hospitality students of a tertiary institution who had just taken a course in food hygiene. Questionnaires and focus group interviews were used to collect data. The result was analysed using deductions and SPSS version 16.0 for windows. Findings revealed that, majority of students had knowledge regarding handling leftover food, cross contamination and personal hygiene. There were, however, deficiencies in food hygiene practices and attitudes due to complacency, time, poverty and peer pressure.

Keywords: Food Hygiene, Food poisoning, Hospitality Students, Polytechnics. Training,

1. Introduction

Tourism promotion continues to be a major government business in Ghana because of the revenue tourism generates into the economy. Available statistics from the Ghana Tourist Board revealed that, revenue generated by the tourism sector in 2009 was $1,615.2 million dollars, compared to $1,403.1 million dollars obtained in 2008 (GNA 2010). Ghana also earned some $1.8 billion from tourism in 2010. This amount was realized from some 950,000 tourists who visited the country within the period (Debra 2011). The passing of the Ghana Tourism Authority bill [Act 817] which upgraded the Ghana Tourist Board to an Authority now known as the Ghana Tourism Authority (GTA) is expected to promote the sustainable development of the tourism industry. The attention on tourism promotion may have resulted in the mushrooming of hospitality businesses scattered all over Ghana. They include hotel, restaurants, pubs, clubs and roaming food vendors. These facilities provide among other services, prepared meals of all kinds to anybody who could afford even though some of these sellers have little or no food hygiene education (Mensah et al, 2002; Ansong, 2008). Recent developments, however, have given rise to concerns about these already prepared foods eaten particularly from outside the home. These concerns centre on the increasing rate of food poisoning (Holt, & Henson, 2000); arising mostly from poor food hygiene practices by food handlers (Hertzman, & Barrash 2007; Worsfold, & Griffith, 2003). According to Salas, (2011); Dominic, (2010) and Koomsom, (2010), food poisoning statistics in Ghana is 5.8 million annually. These outbreaks resulted in hospitalisation and death of people who were affected. A study by Mensah et al, (2002) to investigate the microbial quality of street foods in Accra, the capital city of Ghana, also revealed that, many foods that were being sold to the public on the streets of Accra were contaminated with Salmonella Arionae and Escherichia Coli.

Experts suggest food hygiene training is required to improve food hygiene practices amongst food handlers (Mensah et al, 2002). These suggestions appear to support other findings (Haapala, & Probart, 2004), since training has been found to improve food hygiene knowledge (Worsfold, 2004). Annor & Baiden (2011) also

evaluated hygiene knowledge and practices among food handlers in hotels in Ghana and found a relationship between food hygiene training and employees level of knowledge of food hygiene. This is probably the reason why food hygiene practices in hotels is perceived better than outside the hotel environment since food handlers in hotels are mostly trained graduates from hospitality institutions and are therefore expected to have knowledge about food hygiene and be able to practice food hygiene. The relationship between knowledge and practice, however, has not been fully established. Researchers like Medieros et al., 2001; Haaple, & Probart, (2004), Clayton and Griffith, (2004) argue that, food hygiene knowledge does not necessarily result in behavior change. Herzman and Barrash (2007)'s work on catering events in Las Vegas also found that even though catering employees had knowledge of food hygiene, many of them did not practice it. The reasons for the inability of caterers to practice food hygiene are often attributed to work stress, lack of adequate equipment and lack of enforcement (Green &Selman 2005; Seaman, & Eves, 2008; Pocock et al, 2007).

Hospitality students are not affected by the pressures of work environment and therefore are expected to demonstrate food hygiene knowledge and be able to practice food hygiene. Hospitality programmes of polytechnics in Ghana include courses in food hygiene (National Syllabus for HND in Hospitality Management, undated). At the Higher National Diploma level for example, food hygiene is one of the first semester courses of the six- semester programme. The food hygiene courses include personal hygiene, food storage and cross contamination among others (National Syllabus for HND in Hospitality Management, undated). It is therefore expected that hospitality students exhibit the necessary knowledge and attitudes towards food hygiene practices in order to ensure food safety and reduce food poisoning outbreaks in Ghana.

The purpose of this study therefore is to explore food hygiene knowledge, practices and attitudes regarding handling leftover food, cross contamination and personal hygiene. To the best of the authors' knowledge, food hygiene research on knowledge, attitude and practices of hospitality students in the Ghana is limited. The originality therefore lies in the focus of this study on hospitality students of polytechnics in Ghana in particular. It is important to do this study because of the students' future roles as food handlers in hotels and other sectors of the hospitality industry.

1.2 Literature Review

1.2.1Food Hygiene

Food hygiene is the science and practice of preserving health and is one of the most important subjects for all persons working in the hospitality industry. (Foskett et al, 2003). Food hygiene refers to the measures food handlers use to ensure the safety of food during preparation, storage, cooling and service. Lack of adequate food hygiene can lead to food poisoning and death of the consumer. The five key principles of food hygiene, according to World Health Organisation (WHO) are prevention of contaminating food with pathogens spreading from people, pets, and pests, separation of raw and cooked foods to prevent contamination, cooking foods for the appropriate length of time and at the appropriate temperature to kill pathogens, storage of food at the proper temperature and the use of safe water and cooked materials. To ensure food hygiene means food handlers must pay attention to personal hygiene, food preparation and storage as well as the service of food (Wikipedia, 2014)

1.2.1.1Personal hygiene

Personal hygiene is important if food contamination is to be prevented. Food can transmit disease from person to person as well as serve as a growth medium for bacteria that can cause food poisoning. According to Fosket et al, (2003), persons suffering from ill health or who are not clean about themselves should not handle food. Research indicates that most of the food poisoning outbreaks were caused by poor personal hygiene especially concerning improper washing of hands (Weinstein, 1991) According to Fosket et al, (2003), hands must be washed thoroughly and frequently, particularly after the usage of the toilet, before commencing work and during the handling of food. The nose should not be touched when food is being handled in the presence of a customer. Ideally, paper handkerchiefs should be used when sneezing or coughing and then destroyed, and the hands washed afterwards with soap.

1.2.1.2Cross Contamination

Cross contaminations which refers to the transfer of germs from one food item to another occurs mainly in the kitchen because of contact between cooked food and contaminated hands and equipments. Many diseases can be introduced by hands, for example, Hepatitis A can be introduced by unwashed hands of food handlers who are

themselves infected (Ansari-Lari etal, 2010). To avoid cross contamination, a factsheet published by Bupa's health information team, (2008), suggests that, it is important to wash the hands and nails with hot, soapy water before handling food, between handling cooked and uncooked foods, and after going to the toilet. Hands must always be clean and dry because hands transfer germs more effectively than dry hands. Different cloths must also used for different jobs (e.g. washing up and cleaning surfaces). The team also suggests that, caterers must not handle food when having stomach problems such as diarrhoea and vomiting, or during sneezing or coughing frequently. Cuts and sores must also be covered with waterproof plasters. If possible, rings, watches and bracelets must be removed before handling food because germs can hide under them (A factsheet published by Bupa's health information team, September 2008).

1.2.1.3 Handling Leftover Foods

According to the European Food Information Council, (2000), most people hate to throw out food that has not been eaten at the end of a meal resulting in leftovers. Many restaurant customers also choose to take home leftover food for a family member or themselves to eat, however there are potential food safety risks involved in doing this (Consumer protection Western Australia, 2012). Improper handling and storage of leftovers is one of the most common causes of food poisoning in the home. News release by The Salt Lake Valley Health Department (SLVHD) in November 22, 2010 issues a "Left-over Alert" indicating 400,000 cases of food poisoning are caused by leftovers each year. However, with care, it is possible to avoid food poisoning. The SLVHD recommends that leftover food should never be allowed in room temperature for more than one hour especially in warm weather because bacteria can grow to harmful levels, making it unsafe to eat and must therefore be thrown away. The SLVHD also suggests that leftover food should be moved to a new container, not stored in the container it was cooked or served in. Leftovers must not be cooled on the kitchen counter; it should be covered and put straight into the refrigerator at a temperature below 5°C.to avoid food poisoning (Martin, 2012).

1.3Method

1.3.1 Research Design

The study adopted an exploratory approach using questionnaires and focus group interviews to explore and collect data for the study. This approach was adopted because of the need to collect in-depth information from the respondents (Saunders, 2012). Interviews were therefore semi-structured using questions adopted from a combination of consumer attitude survey by Food Standard Australian, New Zealand (2008) and Patah et al, (2009). The authors used relevant questions on food hygiene knowledge, food hygiene practice and food hygiene attitudes which were found useful in this study.

All female first year hospitality students totaling one hundred and twenty-two (122) of one Polytechnic in Ghana were targeted for the study. The students were targeted because they had just taken a food hygiene course. Female students were targeted because male students were too few to influence this study and therefore were not included. Out of a total student population of one hundred and twenty-two (122), only ten (10) were males (Class list, 2011/2012). Out of the targeted female population of one hundred and twelve (112), only one hundred and four students were present at the time of data collection. The questionnaires were administered personally to all female students present in class on the day of data collection and filled questionnaire were collected on the same day. After screening the filled questionnaires, only ninety-three (93) filled questionnaires were suitable for analysis.

A focus group discussion was also organized using eight final year hospitality students to further explore attitudes to food hygiene. The students were conveniently picked to take part in the study. The interview questions were unstructured to allow students to express their knowledge freely about student attitudes to food hygiene. The interview lasted for one hour thirty-five minutes. All the eight hospitality students were present in the same room at the same time.

1.4 Findings

A number of variables were incorporated in the questionnaire to assess students' knowledge and practices of food hygiene. The questions were to assess student knowledge on handling leftover foods, prevention of cross contamination and personal hygiene.

Table 1 Age of Respondents

Response	Frequency	Percent
Below 20	9	9.7
21 - 30	77	82.8
31 - 40	7	7.5
Total	**93**	**100.0**

Source: Field Data, April 2013

The table above shows the category of students who took part in the study. The table indicates that majority of students were young adults between the ages 21-30 representing 82.8 percent of the respondents. Few totaling nine (9) representing 9.7 percent and seven (7) representing 7.5 per cent were below 20years and above 30 years respectively.

1.4.1 Handling leftover foods.

In order to determine students' knowledge about how to handle leftover food, two questions were asked, namely; *How do you store your leftover food to avoid food poisoning* and *at what temperature do you preserve it?* Finding indicates 13 out of 93 students refrigerate their leftover food in the saucepan in which the food was cooked. 72 of the students transfer the remaining food in a plastic container before placing in the refrigerator and 8 of the students leave the cooked food in the saucepan on the stove in the kitchen.

Table 2 Storage of leftover food after cooking

Response	Frequency	Percent
Place saucepan in refrigerator	13	14.0
Store remaining in a plastic container	72	77.4
Leave the rest on the stove in the kitchen	8	8.6
Total	**93**	**100.0**

Source: Field Data, April 2013

The above table shows that majority of students forming about 77% have knowledge on how to store leftover food to avoid food poisoning. It is however worrying that more than 22% of the students have no knowledge about how to correctly preserve left-over food.

The second question which seeks to determine student knowledge about the correct temperature of storing leftover food also revealed mixed responses. Responses to the question ' *at what temperature should leftover food be stored in a refrigerator?'*

Table 3 Temperature for storage of leftover to avoid food poisoning

Response	Frequency	Percent
Below 5 °c	69	74.2
5 °c - 10 °c	15	16.1
10 °c - 15 °c	7	7.5
Above 15 °c	2	2.2
Total	**93**	**100.0**

Source: Field Data, April 2013

The table above indicates that sixty nine (69) out of the ninety-three (93) students indicate below 5°c, fifteen (15) students indicated between 5 °c - 105 °c, seven (7) of the students indicated 10 °c - 15°c and only two (2) students indicated above 15°c. This shows that majority of students forming 74% know the temperature at which left-over food should be stored to prevent food poisoning. The remaining 26% have no knowledge about the temperature at which leftover must be preserved.

Cross Tabulation of Storage of Left**- Over Food and Temperature**

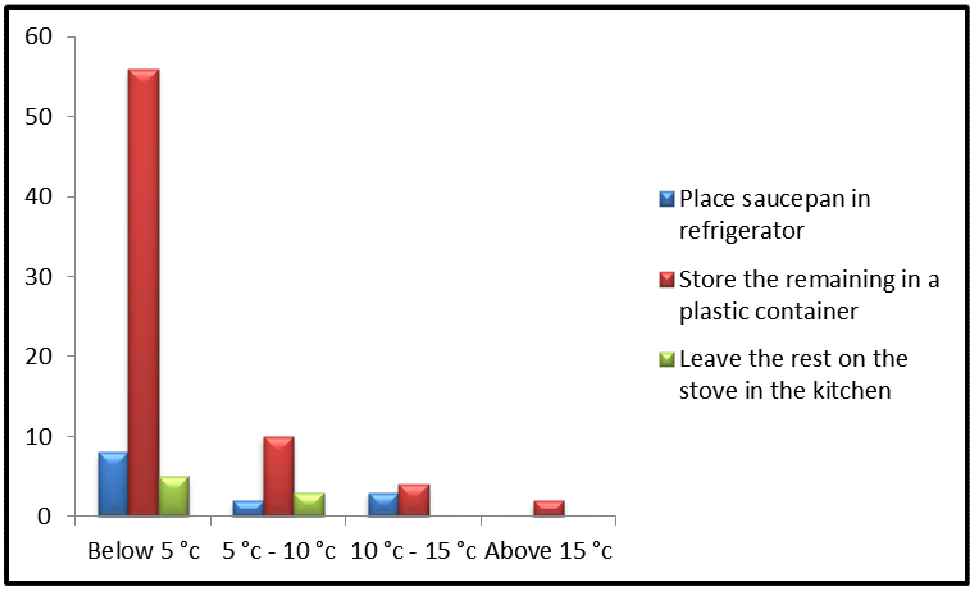

Fig 1 Cross Tabulation of Left- Over Storage/ Temperature.

Field data: April, 2013

A cross tabulation of the responses to both questions as shown on figure 1 revealed that, out of the ninety-three (93) students sampled, only fifty –six (56) students representing 60% of total respondents had knowledge about how to preserve leftover food properly to prevent food poisoning. Five students had both storage and temperature wrong, fourteen (14) of the students had knowledge about storage but did not know the temperature. Thirteen (13) students knew the temperature but did not know how to store that left-over food properly.

1.4.2 Cross Contamination

To determine student knowledge about cross contamination, the following questions were asked. 1.*What would you do if you found cracked egg among eggs purchased* and *2. Suppose you have raw meat and salad to store in the refrigerator, how will you position both* ? Response indicates that eleven (11) of the students will cook the eggs , fifty-nine (59) of them will throw it away and twenty-three (23) of students will put it in the refrigerator.

Table 4 Handling purchased cracked egg

Response	Frequency	Percent
I cook it	11	11.8
I throw it away	59	63.4
I put in the fridge	23	24.7
Total	**93**	**100.0**

Source: Field Data, April 2013

This means majority of students have knowledge about how to prevent cross contamination by throwing such eggs away.

In response to the second question, three (3) of the students will place both raw meat and salad on the same shelf in the refrigerator, seventeen (17) of them will place meat above salad whiles seventy-three (73) of the students will place salad on a shelf above the raw meat.

Table 5: Positioning raw meat and salads in refrigerator

Response	Frequency	Percent
Both on the same shelf	3	3.2
Meat on shelf above salad	17	18.3
Salad on shelf above meat	73	78.5
Total	**93**	**100.0**

Source: Field Data, April 2013

This response also indicates that, majority of the students answered correctly and therefore had knowledge about how to prevent cross contamination.

Cross Tabulation of Positioning Meat and Salad in a Refrigerator

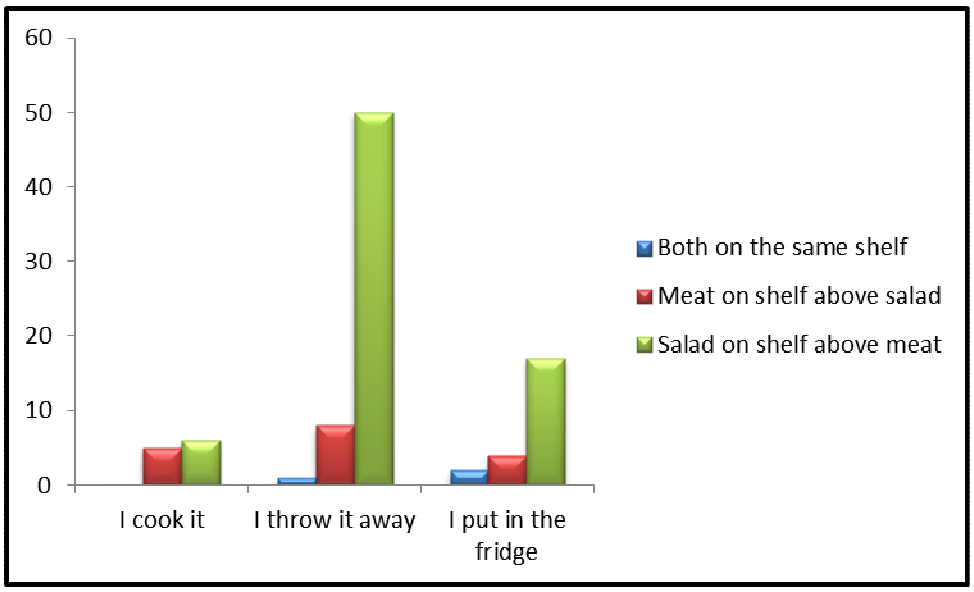

***Fig 2* Cross Tabulation of Positioning Meat/Salad**

Field data: April, 2013

Cross tabulation revealed that majority of students representing 53% of the respondents will place salad above meat in the refrigerator and will throw cracked eggs away. Ten percent (10%) of the students will throw egg away but had no knowledge about how to place raw meat and salad correctly in the refrigerator, twenty-five percent (25%) of students had knowledge about how to position raw meat and salad in a refrigerator but did not know how to handle purchased cracked egg to avoid cross contamination. Twelve percent (12%) of the students did not know how to either handle purchased cracked eggs or correctly position raw meat and salad in a refrigerator to prevent cross contamination. This means a total of thirty-seven percent (37%) of the students may not able to prevent cross contamination as shown in figure 2 above.

1.4.3 Personal Hygiene

To determine whether students had knowledge about personal hygiene, two questions were asked namely 1. *What do you do when you want to sneeze or cough whiles cooking?* and *2.What do you do immediately after sneezing / coughing whiles cooking?* The results indicate that twenty-eight (28) out of the ninety-three (93) students sneeze in their handkerchief, 19 students turn their face away from food and sneeze/ cough without covering their mouth whiles forty-six (46) of them cough/sneeze in disposable tissue

Table 6 Handling coughing / sneezing whiles cooking

Response	Frequency	Percent
Cough/sneeze in my handkerchief	28	30.1
Turn face away and Cough/sneeze	19	20.4
Cough/sneeze in disposable tissue	46	49.5
Total	**93**	**100.0**

Source: Field Data, April 2013

This means majority of the students had knowledge on how to sneeze/cough hygienically whiles cooking to prevent food contamination.

On washing hands after coughing /sneezing, ninety-one (91) wash their hand with soap after coughing /sneezing whiles only two (2) indicated they wash their hands but without soap

Table 7. Hand washing with soap after sneezing/ coughing?

Response	Frequency	Percent
Wash hands with soap	91	97.8
Wash hands but without soap	2	2.2
Total	**93**	**100.0**

Source: Field Data, April 2013

The table above shows that more that 97% forming the majority of respondents wash their hands with soap after sneezing and coughing.

Cross Tabulation of Sneezing and Hand Wash during Food Preparation

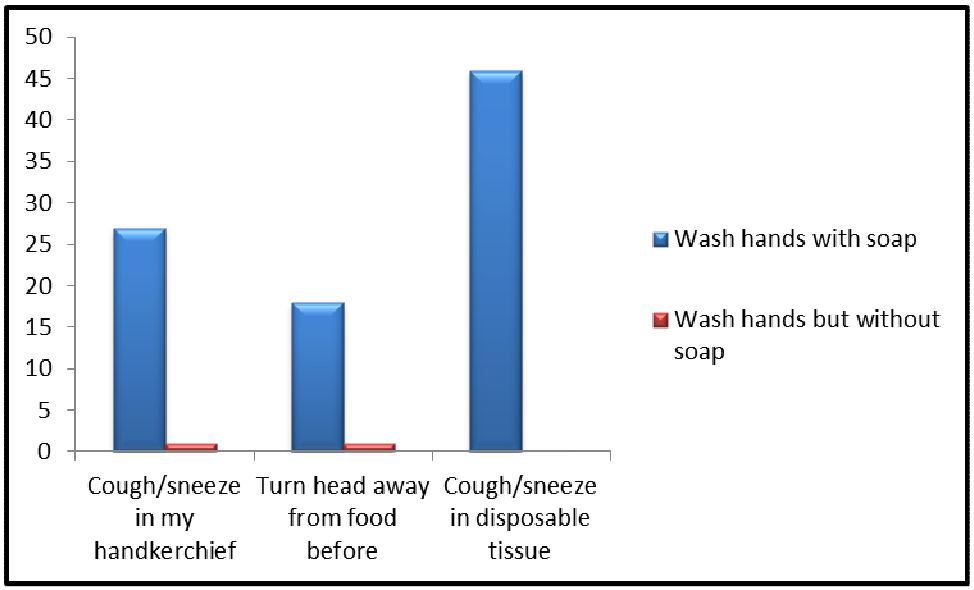

FIG 3: Cross Tabulation of Sneezing/ Hand wash

Field data: April, 2013

Figure 3 above shows results from cross contamination between sneezing/ coughing and hand washing revealed that forty-nine percent (49) of the students cough/sneeze into disposable tissue and wash their hands with soap after coughing / sneezing. Forty- eight percent (48%) of them do not handle cough and sneeze hygienically but wash their hands with soap after coughing /sneezing. Only two percent (2%) do not handle cough/ sneeze hygienically. This shows that less than 50% of the students had knowledge about personal hygiene.

1.4.4 Attitudes to food hygiene

The focus group discussions centered on whether students were interested in food hygiene and whether they were concerned about food hygiene. Issues about why students patronize foods from unhygienic places and how they feel about leftover foods were also explored.

1.4.4.1 Students' Interests in Food Hygiene

From the discussion, it was revealed that majority of students were interested in food hygiene. Generally, students are concerned about the sources of raw materials for cooking as well as the hygiene conditions of sellers of cooked food on campus where students are compelled to purchase. This was amply summarised by one student as follows;

'*Just look at the woman selling kooko (corn-dough porridge) over there on campus, she used to sell under the tree but has recently moved to another location very close to a filthy gutter with all the smell and the flies but students continue to patronize the kooko (corn-dough porridge), just look at the queue waiting to buy the kooko, it is serious.' I can never buy from that woman'.*

However, not all students were really interested in food hygiene because students consider food hygiene as sometimes boring and repetitive since food hygiene is practiced at home. According to one student even without food hygiene lessons, it is possible to provide safe food. This is quoted as follows;

'*Food hygiene is basic and taught at home from childhood. For example, parents always insist you wash your hands before eating, wash your fruit before eating, you don't eat in dirty plates etc. so food hygiene lessons become one of repetition and boring'.*

1.4.4.2 Patronage of unhygienic foods

Students are concerned about food hygiene practices of food sellers on campus but continue to patronise such foods mainly because of limited time available to prepare their own foods. Some students also do not believe they can get infected because they have 'African stomach', which they claim is immune to any bacteria, even though some students suffered foods poisoning after eating such food. There are also students who just do not care or just feel too lazy to cook and therefore will buy any food whether hygienically presented or not, hoping nothing will happen to them. There are also students who buy such foods because it is cheaper and affordable and can sometimes be tastier than restaurant food as explained by one student;

'*It is cheaper to buy from such places. Even though there are other places to buy food on campus, cost per plate is comparatively high. If you have one cedi, you can buy a plate of food at the 'bush canteen' but you cannot use the same amount to buy food at the student cafeteria'. 'Sometimes their food is nicer than those being sold at the restaurant.*

1.4.4.3 Handling leftover foods

Students would eat leftover foods from family members and never from friends. The students believe it is safer to eat leftovers from family members because they trust their family members.

Storage of leftover cooked food depends on the availability of time and refrigerator. Students feel it is faster to reheat such food than left-over from the refrigerator. In addition, leftover food can be stored safely without refrigerator as remarked by one of the student as follows;

'Our forefathers and parents never had any refrigerator. That is how they have been preserving their food for all the years and nothing happens. What they do is simply heat the food very well and make sure nobody fetches some until the next day. The first thing they do is to heat all foods left overnight for use during the day'. Nobody had food poisoning from that practice. Our forefathers even lived longer than we are doing now'

Students who leave their food overnight in the kitchen do so because of lack of refrigerators and the belief that food prepared by them was safe. This attitude supports others who suggest that, people believe there is little risk associated with food prepared by them (Griffith, & Redmond, 2001).

1.5 Discussions and Conclusions

Food hygiene training is important if consumers are to be protected from food poisoning because many researchers recommend training as a means of improving food handling standards (Rennie, 1994; Mensah etal, 2002) In this paper, it has been revealed that food hygiene training can result in food hygiene knowledge but does not necessarily result in positive attitudes (Medeiros et al., 2001; Haaple, & Probart, (2004), Clayton and Griffith, (2004). Attitudes toward food hygiene especially by students depend on other variables such as time (Worsfold et al, 2004), finance, peer pressure and the level of training one gets at home. Seyler et al, 1998 in Worsfold et al, (2004) also found that peer support is important in behaviour change after food hygiene training. The result of this study showed only 60% of total respondents had knowledge about how to preserve leftover food properly. Fifty-three percent (53%) of the respondents have knowledge about how to prevent cross contamination and forty-nine percent (49%) of the students have knowledge about personal hygiene. Even though it appears only about fifty percent (50%) of students had knowledge, practice and attitudes towards food hygiene, other results such as Eves et al, (2006) and Tang & Fong, (2004) also indicates that, not all participants of food hygiene training had adequate food hygiene knowledge or practice food hygiene. The reasons for poor attitudes and poor hygiene practices at work places include work stress, lack of adequate equipment and lack of enforcement (Green, & Selman 2005; Seaman, & Eves (2008; Pocock et al, 2007), but in educational institutions factors such as boredom, time, poverty and complacency influence food hygiene practices and attitudes especially on student campuses. A study therefore to establish the relationship between food hygiene practices and the variables like poverty, peer pressure and complacency, will further advance the debate about the causes of non- adherence to food hygiene practices especially amongst hospitality students. It will also be interesting to research into how much students knew about food hygiene before coming to school and how that influences their attitudes towards food hygiene. Perhaps, the major question to be answered from now onwards is how research can enable scholars find how to make students' knowledge of food hygiene result in attitude change too. If the present condition is due to lack of interest because of complacency about what they already know before coming to school, or because of the boredom it brings upon them, peer pressure or poverty, then what kind of research can help discover the ways to raise their interest, eliminate boredom, poverty and connect their knowledge of food hygiene to attitude change? Hence, what is attitude, and how can it be achieved in connection with the knowledge of food hygiene?

1.6 Research Limitations/Implications

The population of this study, consisted of only first year polytechnic students from only one polytechnic, hence, the results may not be generalized to all hospitality students in Ghana. Notwithstanding the limitation, this study draws attention to critical issues on food hygiene knowledge, attitudes and practices amongst hospitality students in Ghana which may form the bases for future research.

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