

## Evaluation of some hotel kitchen staff on their knowledge on food safety and kitchen hygiene in the Kumasi Metropolis

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### Abstract

The hotel industry in Ghana forms one of the sectors of the hospitality industry that offer catering services for profit. People within the high socioeconomic group as well as foreigners patronize prepared food from the hotels with the assumption that foods sold from these hotels are prepared under good hygienic conditions and that the food handlers will practice food safety. In this study, 39 hotel kitchen staffs were evaluated on food safety through semi-structured questionnaire on demographics, knowledge and practices on food safety/hygiene as well as kitchen sanitation. Results indicated that females comprising 56.4%, dominated the hotel food preparation establishment. All the respondents were educated. 74.4 % kitchen staff members were aware of the causes of food poisoning while 35 (89.7 %) were aware that microorganisms can be found in refrigerated foods. All subjects responded positively to the washing of hands during food preparation with over 87.2% indicating that the hands should be washed after touching something different from what is being cooked. In the case of items used to wipe hands, 71% (28) used kitchen napkin. Respondents who were medically examined were 82.7% (34) with only 7.7 % (3) who were employed without medical checkup. In the area of sanitation, 94.9% (37) respondents used fly-proof doors in their kitchens while 66.7% respondents know that cooking environment should be cleaned in the morning, afternoon and evening. Thirty eight (97.4%) respondents disinfected their work surfaces when required. Thus, the research revealed that most hotel kitchen staff from the ten hotels studied, had adequate knowledge of food safety and kitchen hygiene.

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### Introduction

Numerous microbiological hazards and risks are associated with different areas of the food industry (Todd, 2003). According to Clayton *et al.* (2002) the number of food handlers in hotels that receive food hygiene education is high, yet a high proportion of food poisoning outbreaks still occur due to poor food handling practices. Good Hygiene Practices describes “all practices regarding the conditions and measures necessary to ensure the safety and suitability of food at all stages of the food chain”, which is an important process that eventually leads to the safety in the kitchen (FAO, 2012).

The Hygiene Practices covers proper storage of food items, maintenance of clean environment during food preparation, and assurance of all dishes served clean and free of bacteria that can potentially cause further contamination and cause food borne illness (Lee *et al.*, 2012). Although provision of food handling education aid food handling practices, Clayton *et*

*al.* (2002) has stated that, a high proportion of food poisoning outbreaks can still occur irrespective of the number of food handlers that receive food hygiene education. However, it has been shown that provision of food handling education can influence the food handling practices.

Food borne diseases are perhaps the most widespread health problem in the contemporary world and an important cause of reduced economic productivity (Mahami and Odonkor, 2012). In industrialized countries, population suffering from food borne diseases each year has been reported to be up to 30% (WHO, 2007). Developing countries, however, bear the brunt of the problem due to the presence of a wide range of food borne diseases including those caused by parasites (Salas, 2011).

In Ghana, the extrapolated incidence of food poisoning is estimated to be 5.8 million annually (Salas, 2011). The high prevalence of diarrhoeal diseases in many developing countries suggests major underlying food safety problems (WHO,

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2007). Mishandling of food plays a significant role in the occurrence of food borne illnesses. For instance, improper food handling is implicated in 97% of all food borne illnesses associated with catering outlets with Africa contributing 90% of cholera cases globally (Addo *et al.*, 2007). Ghana accounted for 27,000 of these cases with Kumasi in the Ashanti Region being the most affected (Ababio and Addy, 2012). Similarly, poor food-handling practices were implicated to be the major cause of outbreaks of infectious intestinal diseases (IID) in England and Wales according to Egan *et al.* (2007).

Studies on food borne disease outbreaks show that eating food prepared in restaurants is an important source of infection (Angulo and Jones, 2006). These data suggest a critical need for action that is focused on preventing disease transmission within the hotel industry (Angulo and Jones, 2006). This study aims to evaluate the knowledge of kitchen staff on food safety as well as kitchen hygiene in some hotel industries in Kumasi, the Ashanti Region of Ghana.

## Materials and Methods

### Research location

The study was undertaken at ten hotels in the Kumasi metropolis in the Ashanti Region of Ghana. The hotels selected ranged from “three star to budget” and have intense patronage throughout the year.

### Ethical consideration

The data was collected after a written informed consent was obtained from all the Managers of the Hotels and the study approved by the Committee for Human Research and Ethics (CHRE) at the School of Medical Sciences, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.

### Sample size and sampling method

Data was obtained by administering pre-tested semi-structured questionnaire to 39 kitchen employees comprising the cooks, chefs and their assistants from September to December 2012. Stratified random sampling technique was used. The questions covered the demographic information of respondents, knowledge of food hygiene/safety practices and kitchen sanitation.

### Statistical analysis

Statistical Package for the Social Sciences (version 17) was used to analyze survey data using descriptive analysis such as frequencies and percentages and presented using tables, bar and pie charts

## Results

### Demographic information of respondents

The gender of respondents was 38.5% (15) males and 56.4% (22) females 5.9% (2) did not answer this section (missing) (Figure 1). Respondents were within the age range of 15-44 years as shown in Table 1. Fourteen (35.9%) of the respondents were in the ages of 25- 29 years with 20.5% (8) of the respondents being between 20-24 years. Again, 15.4% (6) were between the ages of 30-34 and 12.8% (5) were between 35-39 years and 5.1% (2) of the respondents did not answer that section of the questionnaire.

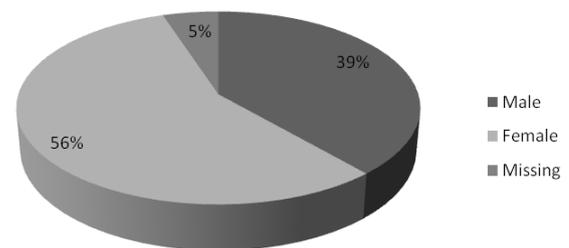


Figure 1. Gender distribution of respondents (n=39)

A reasonable level of education was recorded for the respondents. Table 1, indicates that 35.9% (14) of the respondents attained vocational education, 17.9% (7) had senior high school education, 10.3% (4) had middle school education and 5.1% (2) attained junior secondary school and/or primary school.

From Table 1, 23.1% (9) of the respondents had ordinary certificate in catering while 17.9% (7) had National Vocational Training Institute certificate. Higher National Diploma Certificate holders were 15.4% (6) and 10.3% (4) had Degree in Catering and Food and Beverage service. Only 2.6% (1) of the respondents had 812/2 certificate (that is Advanced Cookery for the Catering Industry). Those without certificate were 17.9% (7) while only 2.6% (1) had other certificate apart from the required ones and no answers were provided from 10.3 (4) of the respondents and this is indicated as missing.

### Knowledge on food safety and practices

The results in Table 2 indicate that 92.3% (36) of respondents have knowledge about food poisoning and only 2.6% (1) had not heard about food poisoning. Those who did not answer were 5.1% (2). Again 89.7% (35) of the respondents knew that microorganisms can grow on refrigerated foods (Table 2). Only 7.7% (3) did not know about this fact and 5.1% (1) did not answer the question. Responses to the number of times the hands should be washed

Table 1. Demographic Information of respondents

Variable	Frequency	%
<b>Age (years)</b>		
15-19	1	2.6
20-24	8	20.5
25-29	14	35.9
30-34	6	15.4
35-39	5	12.8
40-44	3	7.7
Missing	2	5.1
<b>Total</b>	<b>39</b>	<b>100.0</b>
<b>Education level</b>		
Tertiary	8	20.5
Vocational	14	35.9
Senior secondary	7	17.9
Junior secondary	2	5.1
Primary	2	5.1
Middle school	4	10.3
Illiterate	1	2.6
Missing	1	2.6
<b>Total</b>	<b>39</b>	<b>100.0</b>
<b>Professional qualification</b>		
Degree in catering and food and beverage service	4	10.3
HND certificate	6	15.4
Ordinary certificate in catering	9	23.1
812/2 certificate	1	2.6
NVTI certificate	7	17.9
No certificate	7	17.9
Others	1	2.6
Missing	4	10.3
<b>Total</b>	<b>39</b>	<b>100.0</b>

Table 2. Food safety knowledge and practices

Knowledge about food poisoning	Frequency	%
Yes	36	92.3
No	1	2.6
Missing	2	5.1
<b>Total</b>	<b>39</b>	<b>100.0</b>
<b>Knowledge of microorganisms found in Refrigerated foods</b>		
Yes	35	89.7
No	3	7.7
Missing	1	2.6
<b>Total</b>	<b>39</b>	<b>100.0</b>
<b>Number of times hands should be washed during food preparation</b>		
Twice	4	10.3
Three times	1	2.6
When you touch something different from what is being cooked	34	87.2
<b>Total</b>	<b>39</b>	<b>100.0</b>
<b>Items used to wipe hands after hands washing in the kitchen</b>		
Terry towel	4	10.3
Paper towel	6	15.4
Kitchen napkin	28	71.8
Missing	1	2.6
<b>Total</b>	<b>39</b>	<b>100.0</b>
<b>Possession of medical certificate?</b>		
Yes	34	87.2
No	3	7.7
Missing	2	5.1
<b>Total</b>	<b>39</b>	<b>100.0</b>

were very encouraging. Majority of the respondents 87.3% (34) confirmed that when you touch something during food preparation the hands should be washed. Only 10.3% (4) responded that the hands should be washed only twice during food preparation and three times by 1 person 2.6% (Table 2). From Table 2, most of the caterers 71.8% (28) in the kitchen wiped their hands with kitchen napkin. Respondents who use paper towel were 15.4% (4) while 10.3% (6) used terry towel and the missing answers was 2.6% (1).

#### Sanitation knowledge and practices of respondents

Fly-proof doors were common in the hotel kitchens (Table 3). Almost all the kitchens 94.9% (37) had some installed and this is to prevent flies from entering food preparation and consumption areas and subsequently falling into food. Contaminated food preparation surfaces are just a few of the places where microorganisms can enter food. Almost all respondents 97.4% (38 out of 39), disinfected their work surfaces regularly (Table 3). Over half of respondents, 66.7% (26), swept the kitchen morning, afternoon and evening which is a sign of good practice, 15% (6) swept at different times, and the rest, 12.8% (5), morning and evening as shown in Figure 2. Only 2.6% (1) did not provide any answer. It is noted in Table 2 that almost all the cooks in the kitchens had medical certificate 87.2% (34). Only 7.7% (3) did not have medical certificate.

## Discussion

Customer satisfaction in hotels is actually based on the quality of hygiene of food, kitchen and the dining experience. Pathogens in the food preparation area can come from infected food workers and therefore it is important to know whether hotel staffs have any knowledge of food safety. Thus the result obtained from the responses on the perception of food safety/hygiene and sanitation practices on some hotel kitchen workers in the Kumasi metropolis are discussed. Clayton and Griffith (2004) observed that questionnaire studies examining the knowledge, attitude and self reported practices of food handlers may provide general indication of the food safety practices undertaken by commercial food handlers. In this study, the dominance of women in the preparation of food in the hotels is shown in Table 1. This confirms Annor and Baiden (2011) and works by Tomlin *et al.* (2002) on gender of food handlers in the Greater Accra Region of Ghana which concluded that food is mostly prepared by women in Ghana and that they do form the highest number in restaurant operations. Again, other studies conducted in Kumasi on street foods showed that most of the food handlers were females (Ababio and Adi, 2012). The Ghanaian culture where women are the majority food preparers is exhibited in the hotels in Ghana; however, the main

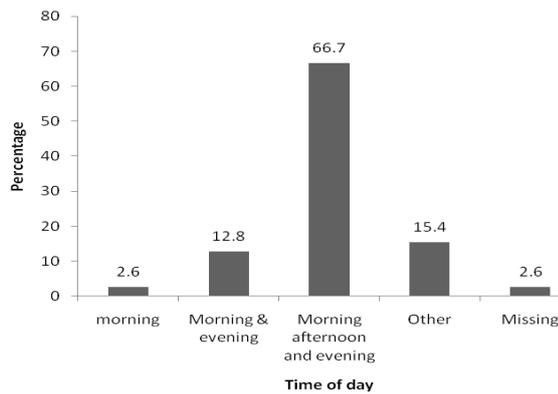


Figure 2. Responses to the number of times cooking environment is cleaned during the day

cooks/ chefs were mostly men with women being assistants.

Majority of respondents, were within the active working group. Other studies done in some hotels in Accra, Ghana by Annor and Baiden (2011) also showed that majority of respondents were under thirty years. At this age, respondents are very young and are able to manage any work given to them. The educational level of respondents is in contrast with the findings of Addo *et al.* (2007) who indicated that most food preparers in hotels in Accra had barely any formal education. The result is however in line with Tonder *et al.* (2007) who reported that 74% of food handlers sampled in their study had some basic education. This could be due to the fact that, the polytechnics, vocational schools and some universities, offer courses in cookery for the hotel industry at various levels, therefore, it is not surprising to find a lot of professionally qualified food handlers with various categories of certificates working in hotels.

However, the fact that one is professionally qualified does not mean what is learnt is being put into practice because literature indicate that 70% of all bacterial food poisoning is caused by caterers with some form of education (Annor and Baiden, 2011).

#### *Food safety knowledge and practices*

Respondents' level of education might have contributed to their knowledge of food poisoning which is important to the prevention of food borne illness in the hotel industry. Respondents may have learnt about food poisoning in their various schools since majority had professional certificate and food hygiene is likely to be found on their syllabus. There were a few respondents who did not know that microorganisms could be found in refrigerated foods.

To promote food safety in hotels every food handler should be educated on refrigeration of food with periodic refresher courses offered.

Table 3. Respondent's knowledge on kitchen sanitation

Fly-proof doors for kitchen	Frequency	%
Yes	37	94.9
No	1	2.6
Missing	1	2.6
<b>Total</b>	<b>39</b>	<b>100.0</b>
<b>Disinfecting work surfaces</b>		
Yes	38	97.4
No	1	2.6
<b>Total</b>	<b>39</b>	<b>100.0</b>

Centre for Disease Control in the USA estimated that errors of food handler contribute about 97% of all cases of food-borne disease in food-service establishments (Clayton and Griffith, 2004). Chen *et al.* (2001) reported that proper hand washing has been recognized as one of the most effective measures to prevent cross-contamination and minimize transfer of microorganisms to ready-to-eat foods in large-scale kitchens. Most people do not realize that as part of the normal flora, we carry a lot of different disease causing microorganisms on our hands.

For instance, it is estimated that approximately 40-50% of all healthy humans carry the *Staphylococcus* bacterium (mainly in the nasal passage which can easily be transferred to hands by simply touching or blowing the nose). About 60-70% of the healthy humans carry *Clostridium perfringens*, which can also be easily transmitted onto foods with hands. Thus, workers should thoroughly wash their hands prior to and periodically during the time that contact is necessary (Vaclavik and Christian, 2008; Mariott and Gravani, 2006). During the work shift, hands should be washed after using the toilets, handling garbage or other soiled material, handling uncooked muscle foods, egg products, or dairy products, handling money, and coughing or sneezing.

As high as 71.8% respondents (Table 2) wipe hands with kitchen napkins. This is not a good hygiene practice because bacteria can be transferred from the napkin onto food after being used repeatedly. Probably, respondents were not exposed to the correct hand wiping materials when they were in school and/or the managers in the study hotels may not have provided the appropriate hand wiping materials for the cooks because they may be costly. Ceserani and Foskett, (2007) maintain that after washing, hands should be cleaned and dried on a clean towel, suitable paper towel or by hot air dryer. Transmission is much more efficient from wet hands, therefore, hand drying after washing has been strongly advocated to reduce cross-contamination and drying is best done with towels from a hands-free towel dispenser (Merry *et al.*, 2001; Harrison *et al.*, 2003).

### *Sanitation knowledge and practices of respondents*

It was good to know that most of the hotels use fly proof doors (Table 3). Flies transmit diseases because they feed on animal and human waste and collect these microorganisms on their feet, mouth, gut and wings and transmit a variety of organisms to humans and food (Foskett and Ceserani, 2007). It has been reported that contamination from the adult house fly is a risk factor in the transmission of diarrhoeal pathogens (Mensah *et al.*, 2007). *Salmonella typhimurium* and *shigellae* have also been shown to multiply in the gut of the house fly (Vaclavik and Christian, 2008).

### *Disinfecting of work surfaces*

It is encouraging to note that 97.4% of respondents disinfected their work surfaces regularly (Table 3). Contaminated food preparation surfaces, are just a few of the places where microorganisms can enter food. Mariott and Gravani (2006), have emphasised that work surfaces can collect microorganisms and other debris from the air, as well as from employees and materials in the kitchen.

Furthermore, microorganisms on raw foods can be transferred to various surfaces, such as cutting boards and tap water handles (Chen *et al.*, 2001). Work conducted by Addo *et al.* (2007) showed 70% coliform on work surfaces after cleaning. Surfaces can be of improved hygienic design such as stainless steel and marble especially in a hotel. The findings as presented in Figure 2 indicate that over half of respondents, 66.7%, swept the kitchen morning, afternoon and evening which is a sign of good hygiene practice. The respondents understand the importance of sweeping to reduce the risk of contamination. This is important because during regular food operation bacteria can be transferred throughout the preparation environment. Foskett and Ceserani, (2007) maintain that sweeping will remove materials and foods that could provide harbor and nourishment for microorganisms as well as prevent the physical contamination of food. Regular sweeping assist in maintaining a comfortable working environment that is safe by reducing the risk of accident to kitchen staff and also provide an attractive environment.

Majority of respondents shown in Table 2 had medical certificate. This is in contrast with studies carried out by Abera *et al.* (2010) on food handlers in Ethiopia where none of them had medical checkup. In a preliminary report on a study conducted by Zain and Naing (2002) on Socio-demographic characteristics of food handlers and their knowledge, attitude and practice towards food sanitation, 61.9% had undergone medical examination which is a good

food safety practice. Food handlers in the kitchens can easily transfer diseases they have onto food which can infect consumers. Even those with medical certificate should periodically go for review.

This study is the first to be reported on evaluation of hotel kitchen staffs on food safety in the Kumasi Metropolis. Respondents seemed to have a lot of knowledge about food hygiene and sanitation probably because of their level of education attained.

### **Conclusion**

Generally, it was observed that respondents were knowledgeable about food safety, hygiene and sanitation which are one of the international codes of practice by the Codex Alimentarius Commission. It was also found out that over half of the food preparers in the hotels were females, mostly being young adults with formal education and professionally qualified. The food safety knowledge and the professional qualification indicate that foods from these hotels would be safe and suitable for consumption as well as improve the reputation and consumer confidence of the hotels. The control of the environmental and technical sources of contamination is necessary to protect the consumer. Regular evaluation has to be carried out to ensure constant food hygiene practices.

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