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RESEARCH ARTICLE

EVALUATING HYGIENIC PRACTICES IN RESTAURANTS ('CHOPBARS') IN SUBIN SUB-METRO, KUMASI

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ABSTRACT

The purpose of this study was to find out health implications of food from restaurants on consumers in the Sub in Sub-Metro in Kumasi. Descriptive research design was adopted to guide the study and the instruments used were questionnaire and observation checklist. The data collected to answer the research questions were analysed with frequency, percentage and pie charts. The result from the study revealed that personal hygiene practices were very low in the 'chopbars' visited. Hand washing and handling of foods were found to be unhygienic in the 'chopbars' surveyed. The result further showed that majority of the customers that buy food in 'chopbars' in the sub-metro check for clean and neat surroundings before buying their food.

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INTRODUCTION

More and more people are eating away from home each year and a lot of factors may account for this developing trend. The contributing factors may be due to convenience or recreation and others due to necessity (Garden-Robinson, 2017). Food consumption away from home is becoming common and in the case of the US, 48% of food expenses were recorded in 2011 (as cited in Medeiros and Salay, 2013). According to Medeiros and Salay (2013), increasing relevance of food consumed away-from-home brings new challenges for public health policies. Policies to regulate how food should be preserved and served are some of the means to reduce food borne diseases as a result of contaminated foods. Kisembi (2010) noted that the lack of knowledge and skills on the good manufacturing practices in the developing countries have contributed to poor hygienic practices in food service establishments. Less studies on food safety among academics, in food science, has led to health administrative departments taking the evaluation of food safety and hygienic practices of food establishments (GoK, 1999).In other to enhance food safety globally, HACCP has been endorsed as universal code with regards to safe food production and consumption of food among the public (Food Codex Alimentarius Commission, 1995).

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Food borne illness cost lives and money. Millions of people become sick each year and thousands die after eating contaminated or mishandled foods (Garden-Robinson, 2017). Estimates for the cost of food borne illness were released in 2010 and 2012 to be $152 billion and $77.7 billion, respectively (Scharff, 2012). According to Scharff (2012) there are 30identifiablepathogens and other food borne illnesses for which no pathogen source can be identified were responsible for food borne illnesses. Hazards can be introduced into foodservice operations in numerous ways: by employees, food, equipment, cleaning supplies and customers (Garden-Robinson, 2017). According to Garden-Robinson (2017), the hazards may be biological, chemical or physical.

The research questions to evaluate hygienic practices in restaurants within Subin Sub-Metro in Kumasi are:

- Under what conditions is food prepared and served by restaurant operators?
- What is the health status of the food handlers or cooks?
- Is food properly handled and safe for consumption?

Review of related literature

Conditions under which food is prepared and *served in restaurants:* In Indonesia, a study had revealed that about 64

per cent of small restaurants and 72 per cent of medium restaurants comply with the requirements requested by the legislator with respect to safe food regulation (Sienny and Serli, 2010). The result obviously indicated that most of the restaurants have been doing the right thing in following the regulations as laid down by the Indonesia authorities. In the same study of Sienny and Serli (2010), the result had indicated that restaurant owners of the medium restaurants give the highest priority to the kitchen. Although the study did not actually indicate the issue pertaining to kitchen, it could be presumed that hygiene may form the major aspect of the restaurant owners. The kitchen environment forms the key area that food could be contaminated either during the preparation or serving the ready to eat food. In a similar study, conducted on environments where food is served had identified factors that could urge customers to buy food or otherwise (Leach, Mercer, Stew and Denyer, 2001). The factors as highlighted by customers are the most important factors in providing food. These factors were; flies being kept away from food; personal hygiene issues: cleanliness of equipment, surfaces and premises; and the temperature control of food (Leach, Mercer, Stew and Denyer, 2001).The factors as identified when found to be appealing to customer could let them buy the food. Everybody perhaps, would not like to use his/her money to buy any sickness. The individual can avoid food borne diseases by chosen where to buy food or not for the sake of his/her health.

A study conducted into hygiene practices in urban restaurants in Thika town of Kenya had revealed that restaurants in Thika town do not adequately follow safe food hygiene and manufacturing practices or processes (Kisembi, 2010). The study further revealed that the staff surveyed had acknowledged the fact that food contained bacteria which can present microbial hazard to their customers if the food is poorly handled in the kitchen (Kisembi, 2010). The study by Kisembi (2010) also noted that the respondents did not apply any good quality control strategy in preparing food. This has therefore made consumers not to be sure of the food safety standards. The mere fact that the respondents could not tell of how safe their prepared food is free from microbial hazards calls for a worry. The safety of the consumers is not totally secure with the fact that those directly handling the foods and cannot assure of microbial free status of the foods they prepare and serve.

Health status of the food handlers or Cooks: A study in Neuchâtel had revealed that food handlers did have substantial food safety knowledge gaps among restaurant food handlers and the researchers were of the view that this may place restaurant consumers at risk for food poisoning (Panchal, Bonhote and Dworkin, 2013). Inability of food handlers to determine what could cause food poisoning in their clients is very risky to those they may be serving the foods with. Any food borne diseases can easily be passed on to the unsuspecting general public in their catchment areas or even beyond. A study in Dubai had indicated that the prevalence of parasitic infection among food handlers was 2% (Al Suwaidi, Hussein, Al Faisal, El Sawaf and Wasfy, 2015). Despite the fact that the prevalence of parasitic infection was low, this does not mean there is no cause for alarm. Even the minute case could trigger food borne diseases which may be disastrous to the consumers. According to Sanlier (2009), food handlers may cause food borne diseases by cross-contaminating the raw and processed foodstuffs as well as cooking and storing food under inappropriate conditions and using contaminated equipment. The cross-contamination may not be intentional in anyway but the end result could be very dangerous to the people consuming the food. It is however, appalling to note that in the United Kingdom, only 58% of the food handlers knew that food poisoning can be caused by cooked rice and several food handlers did not know the temperature required to control the growth of bacteria (Walker, Pritchard and Forsythe, 2002).

Safe food for Consumption: In selecting safe food for consumption, women were perceived to be very careful as to what to feed their families with as compared to their male counterparts (Medeiros, and Salay, 2013). This study thus paints a vivid picture of how women are very careful of health as to what food their families have to feed on to avoid food borne diseases. In an experimental study, the result has revealed that posting food safety info sheets is an effective intervention tool that positively influences food safety behaviours of food handlers (Chapman, Eversley, Fillion, Maclaurin and Powell, 2010). Good knowledge on food handling makes it safe to some extent that any food being served could be safe for consumption. A person knowing what should be done to avoid unsafe food to his/her consumers become very important.

A study to find the consumer food safety perceptions of ready-to-eat deli foods in Northwest Arkansas had revealed that majority of the respondents have indicated that deli foods are "as safe as" (66%) or "safer than" (32%) restaurant foods. The food safety perception depended on shopping frequency at delis as well as formal education level. The study further showed that with an increasing frequency of shopping at stand-alone delis, consumers were more likely to perceive deli foods as "safer than" restaurant foods and consumers with a post-secondary degree were more likely to categorize deli foods as "as safe as" restaurant foods (Van Loo, Ricke, Milillo, Seideman and Crandall, 2010). This result has indicated that when it comes to food safety, the consumer has a greater say and it also borders on the individuals understanding of safe food. Food being safe largely depends on the person preparing the food for consumption. A study has shown that 74% of food handlers at home performed at least one unsafe food handling practice (Daniels, Daniels, Gilmet and Noonan, 2001). The unsafe food could lead to a lot of challenges to the person consuming the food. Lack of education and awareness about food safety according to Daniels *et al*. (2001), has accounted for 80% of unsafe food handling practices. Having knowledge on foods and its safety is seen as a prerequisite to safe food handling (Kennedy, Jackson, wan, Blair, McDowell and Bolton, 2005; Lin, Jensen and Yen, 2005).

RESEARCH METHODS

The methodology used in carrying out the study was discussed under the following sub-headings: The research design, sampling technique, data collection procedure and how the data was analysed.

Research Design: **In** view of the variable and the intent of the study, descriptive design was adopted for the study since the intention of the study was to report what actually exists on the field. None of the variables in the problem under investigation has been manipulated.

Population: The target population for the study includes food handlers or workers, employers (chop bar operators) and food consumers in the Subin Sub-Metro. According to Kumasi Metropolitan Assembly (KMA), four hundred (400) chop bar operators have registered and are operating with valid documents. Out of the four hundred operators, 160 are operating in the Subin Sub-Metro.

Sample* and *sampling Procedure: The sample size for the study was 100, which includes 10 chop bar operators or owners, 50 employers and 40 consumers. In determining the sample size for the study, multi-stage techniques was adopted which include simple random sampling, cluster sampling and purposive sampling. This was find necessary due to the fact that the focus of the study demand data to be collected from the customers,' chopbar' operators and officials so as to have input from the stakeholders. Ten 'chopbars' in the Subin Sub-Metro were randomly selected from the 160 registered 'chopbars' that were operating in the sub-metro.

Random sampling technique was used to sample the consumers that patronize those 'chopbar' meals. The sampling was done by visiting the selected 'chopbars' during their peak periods which was between 11:00am and 1:00pm. Cluster sampling was used to select the chop bars for the study. The Sub-Sub metro was divided into five clusters and two 'chopbars' were selected from each cluster. This technique was used because the area was too large and the characteristics of the 'chopbars' were almost the same. The names of the chop bars in a cluster were written on pieces of paper and folded. The pieces of the papers with the names were put into a box and shuffled. The shuffling was done to avoid bias while picking the names. Two pieces of papers were selected without replacement from each of the clusters. Four respondents were selected at random from the 10 'chopbar' and were given the questionnaire to complete. This process was repeated in the other 39 'chopbars'. Purposive sampling technique was used because it was only one official that was responsible for that sub-metro that data was being collected.

Research Instrument: The instruments used for the data collection were questionnaire, interview guide and observation guide. The observation was done alongside with the interview to obtain the required information for the study. Questionnaire used was divided into sections and it covers poor sanitary conditions in 'chopbars', unhygienic practices adapted by 'chopbar' operators within Kumasi Metropolis as well as the health status of food handlers. The interview guide was unstructured interview guide to collect data from the sanitary inspector, 'chopbar' operators and consumers. The interview guide covers areas such as 'arrangement of dining room', 'tables', 'chairs', 'walking spaces', 'flooring walls', 'ventilation and lighting', 'personal hygiene' and 'food hygiene. The observation checklist was to evaluate the layout of the 'chopbars', types of netting that was and working areas, serving procedures and the condition of dining rooms, nearness of refuse damps to the 'chopbars', type and state of gutters, place of convenience, storage facilities and bowls used for serving.

Data collection Procedure: The data collection was done by visiting the selected 'chopbars' in the Sub in sub-metro in Kumasi. Permission was sought from operators before the questionnaires were administered and the interviews conducted. The questionnaire and interview guide were used to collect quantitative and qualitative data from employers, employees and food consumers respectively. The interview was conducted on one-on-one basis for the sanitary inspector and 'chopbar' owners. The questionnaires were administered to the 'chopbars' operators, consumers and food handlers in the chop bars.

Data Analysis*:* Frequency and percentages were used to analyse the three research questions. The qualitative data was analyzed by converting the responses into frequencies. Tables, bar charts and pie charts have been used to present the results for discussion. The response with the highest percentage was considered as the general opinion of respondents with regard to the issues. Discussions and interpretation of the result were also carried out alongside the analysis after each table or chart.

RESULTS

The result for the three research questions has been presented and the discussions of the results have been presented after the result of the research questions. *Conditions under which food is prepared* and *served:* In addressing this research question, the results from the field have been presented in Tables 1-5 and Figures 1-6.

Table 1. Keeping kitchen hygiene

Description	Frequency	Percent
Cooking food in kitchen	7	17.5
Cleaning kitchen equipment thoroughly	25	62.5
Sweeping kitchen	7	17.5
Cooking, serving and eating food in kitchen	1	2.5
Total	40	100

Table 1 shows the customers perception about kitchen hygiene. It indicates that 17.5% of the costumers perceive kitchen hygiene is about cooking food in the kitchen, 62.5% perceive it is the cleaning of kitchen equipment thoroughly, 17.5% perceive it is sweeping of kitchen and 2.5% perceive it is about cooking, serving and eating food in kitchen. This depicts that majority of the customers understand kitchen hygiene as cleaning kitchen equipment thoroughly.

Operators practice of kitchen hygiene: Figure 1 shows the customers opinion about the operator's kitchen hygiene practices. According to the data79% of the respondents indicated that the operators practice kitchen hygiene while 21% of the respondents perceived the operator do not practice kitchen hygiene. This suggests that most of the customers are of the opinion that the operators practice kitchen hygiene.

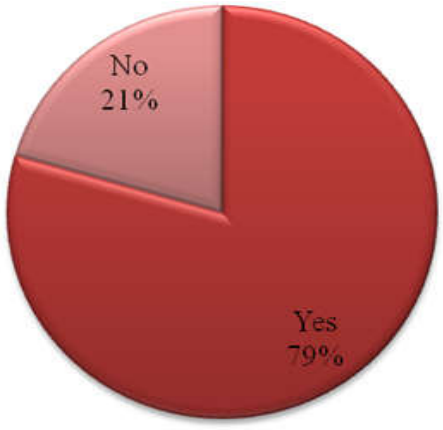


Figure 1- Kitchen hygiene practices of the operator

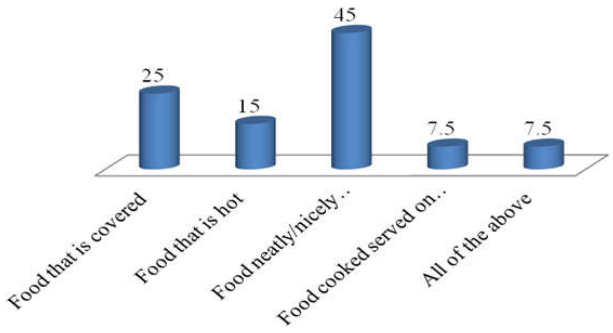


Figure 2. Hygiene check before buying food

Table 2. Reasons for perceiving that operators practice kitchen hygiene

Reason	Frequency	Percent
Cooking and serving equipment well clean	11	34
Equipment and items well arranged	8	25
No waste found on the premises	6	15
No pest/insect found on the premises	7	22
Total	32	100

Table 3. Reasons for buying food from chop bar operator

Reason	Frequency	Percent
To save time from cooking	10	25.0
Don't have time for cooking at home	17	42.5
The food is delicious	8	20.0
Don't know how to prepare this type of food	5	12.5
Total	40	100

What customers check before buying food: Figure 2 shows customers hygiene check before buying food. Twenty-five per cent of the customers check to for food that was covered before buying them. Also, 15% of the customers check to see if food are hot before buying. Forty-five percent of the customers check food that is neatly and nicely presented as their hygiene check before buying food; 7.5% check food that is cooked and served on time and 7.5% also check all the above conditions as their hygiene check before buying food. Table 2 showed the reasons customer perceived that operators practice kitchen hygiene. It indicates that 34.4% of the customers perceived cooking and serving equipment are well clean, 25% of the customers perceived it is when equipment and items are well arranged, 15% when there is no waste found on the premises and 22% perceived there is no pest or insect found in the premises. Table 3 shows the reasons for buying food from chop bar operator. It indicates that 25% of the customers buy food from chop bar operators because they save time from cooking, 42.5% buy from chop bar operators because they do not have time to cook at home, 20% because the food is delicious and 12.5% also buy because, they do not know how to prepare that particular type of food.

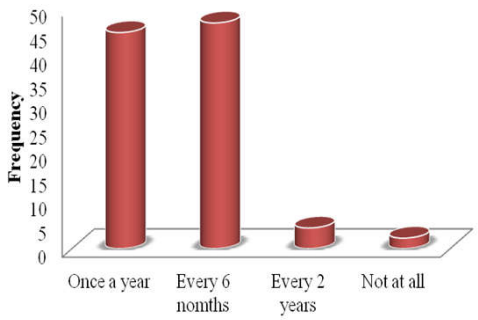


Figure 3-Frequency of medical screening

Frequency of medical screening: Figure 3 shows the frequency of medical screening of the operator. It indicates that 45% of the customers go for medical screening once a year, 47% every 6 months, 4.3% every 2 years and 2.2% do not go for medical screening at all.

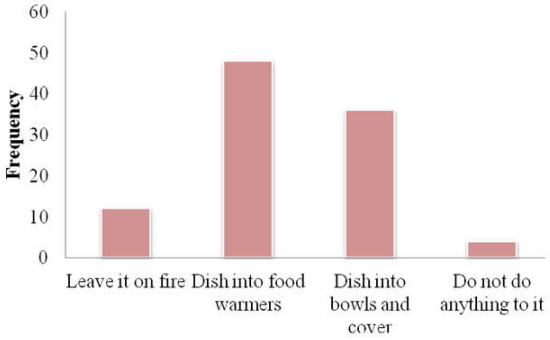


Figure 4. Method of keeping food hot until service time

Method of keeping food hot until service time: Figure 4 shows the method of keeping food hot until service time. It indicates that 12% of food operators leave food on fire until service time, 48% dish food into food warmer, 36% dish food into bowls and cover, and 4% do not do anything to the food. This depicts that most food operator dish food into food warmer to keep it hot until service.

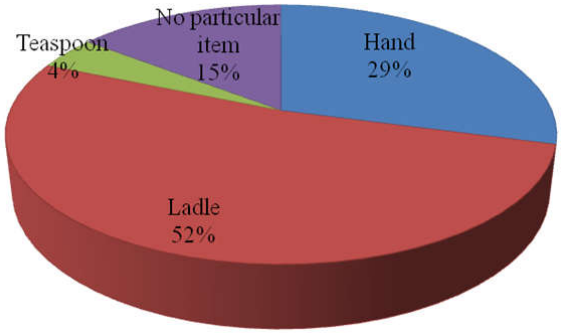


Figure 5. What is use for tasting food during cooking

Tasting food during cooking: Figure 5 shows what use for tasting food during cooking. It indicates that 29% use hand, 52% use ladle, 4% use teaspoon and 15% use no particular item. This shows that majority of food operators use ladle for tasting food.

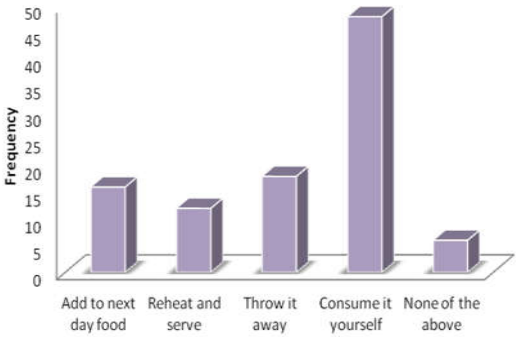


Figure 6. What you do to leftover food

How leftover food is used: Figure 6 shows what food operators do to leftover food. It indicates that 16% add to the next day food, 12% reheat the leftover food and serve, 18% throw it away, 48% consume the leftover food and 6% do none of the above.

Table 4. Disposal of liquid waste

Method	Frequency	Percent
Through drainage systems	17	34.0
Poured into gutter	12	24.0
Poured outside kitchen	5	10.0
Stored in container and poured away later	16	32.0
Total	50	100

Table 5. Place for storing dry Ingredient

Place	Frequency	Percent
Plastic containers	12	24.5
Well ventilated place	23	46.9
In basket	14	28.6
Total	49	100

Disposal of liquid waste: Table 4 shows the ways of disposal of liquid waste. It indicated that 34% of food operators disposed their liquid waste into drainage, 24% poured into gutter, 10% poured outside kitchen and 32% stored their liquid waste in container and poured away later.

Place for storing dry store: Table 5 shows the place for storing dry ingredient. The data shows that 24.5% of food operators store their dry store in plastic containers, 46.9% store in well ventilated place and 28.6% store their dry store in basket.

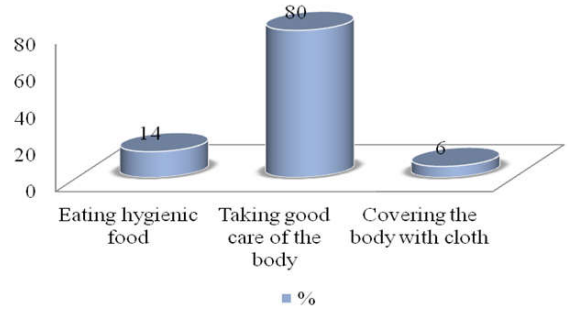


Figure 7. How food handlers handle cooked food

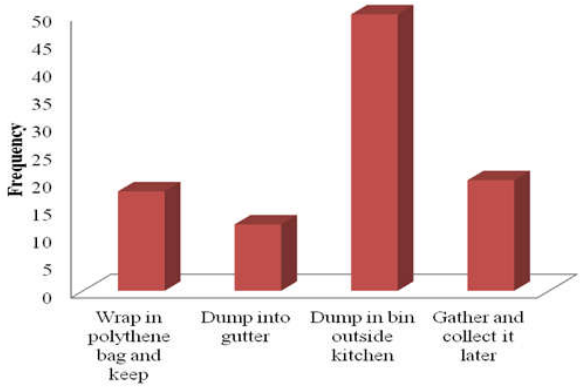
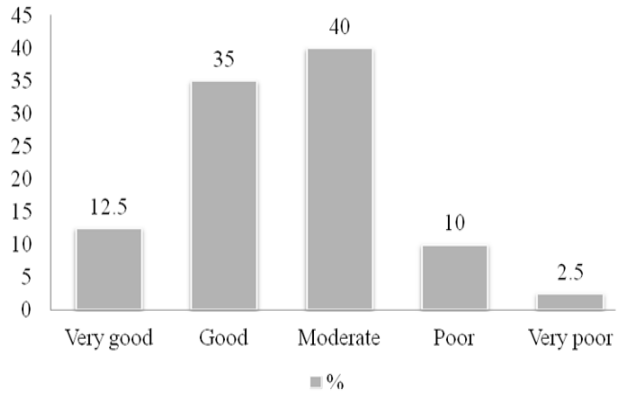


Figure 8. Ways of handling waste in kitchen

Method	Frequency	Percent
Apply mentholated spirit and cover with plaster	45	90.0
Chew cassava and apply on it	3	6.0
Put hands in mouth and tie with rag	1	2.0
Leave it just like that	1	2.0
Total	50	100

Health Status of the Food Cooks: The result from the field to answer the research question on the health status of the food handlers or cooks have been presented in Figures 7- 9.



How food handlers handle cooked food: Figure 7 shows how food handlers handle cooked food. It indicates that 20% of the customers perceived that food handlers use bare hands to handle food when cooking. Thirty percent of the customers perceive food handlers use food tongs for handling cooked food, gain 5% of the customers perceive food handlers cover their hands with polythene bag before handling cooked food, also 45% of the customers perceive food handlers wear gloves for handling cooked food.

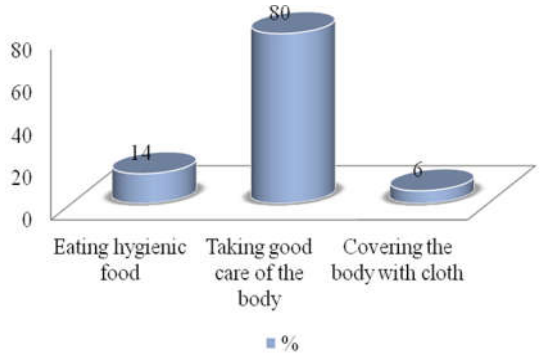


Figure 10. How food handlers handle cooked food

Description	Yes		No	
	Num.	%	Num.	%
Do you use towel/napkin for cleaning your hand	31	77.5	9	22.5
Do you drink from a common cup	25	67.6	12	32.4

Ways of handling waste in kitchen: Figure 8 shows the ways of handling waste in kitchen. It indicated that 18% of the food operators wrap their waste in polythene bag and keep in the kitchen, 12% dump their waste into gutter, and 50% dump waste in bin outside the kitchen and 20% gather in a corner and collect it later.

Proper way of Handling Food before Consumption: The third research objective is on the proper way of handling food for consumption. The results for analysis and discussion have been presented in Tables 6- 7 and Figures 9-10.

Treatment of cuts* and *wounds on your hands: Table 6 shows the treatment of cuts and wounds on your hands. The data shows that 90% apply mentholated spirit and cover with plaster as treatment for cuts and wounds on their hand, 6% chew cassava and apply on it, 48% put hands in mouth and tie with rag and 2% leave it just like that without any treatment.

Rating of quality of food sold: Figure 9 shows customers rating of quality of food sold.

It indicates that 12.5% of the customers rated the quality of food sold to be very good, 35% rated it to be good, 40% gave a moderate rating, 10% also gave a poor rating and finally 2.5% rated it very poor.

How food h*andl*ers h*andl*e cooked food: Figure 10 shows how food handlers handle cooked food. Twenty percent of the customers perceived food handlers use bare hands for handling cooked food and 30% of the customers perceived food handlers use food tongs for handling cooked food. Again, 5% of the customers perceived food handlers cover their hands with polythene bag before handling cooked food and 45% of the customers perceived food handlers wear gloves for handling cooked food.

Use of towel/napkin for cleaning h*ands and *drinking from a common cup: Table 7 shows the use of towel/napkin for cleaning hands and drinking from a common cup. It indicates that 77.5% use towel/napkin for cleaning hands while 22.5% do not use towel/napkin for cleaning hands. About 68 per cent (67.6%) drink from a common cup while 32.4% do not drink from a common cup. This depicts that majority of the customers use a common cup at the chop bar; this has implications on the health of the customers since contamination could easily be spread.

DISCUSSION

Four main understanding of kitchen hygiene exist among customers, they are cooking food in the kitchen, the cleaning of kitchen equipment thoroughly, sweeping of kitchen and cooking, serving and eating food in kitchen. Most of the customers perceived that the kitchen equipment has to be cleaned thoroughly. This is due to the fact that when the kitchen equipment are cleaned it will eliminate possible bacterial that can cause contamination and unhealthy tendencies in the kitchen. The finding is similar to an earlier study by Kisembi (2010) that food can easily be poisoned if safe food hygiene among others is not practiced to the later. Also, knowledge gap among staff in relation to proper food handling could cause food poisoning as well and put customers at risk of food poisoning (Panchal, Bonhote and Dworkin, 2013). In food service businesses, risk will always exist and therefore, food service operators need to identify preventive measures that can be taken at each level on their premises in order to eliminate or reduce such risks.

Most of the customers were of the opinion that the chop bar operators practiced kitchen hygiene. However, some of the customers had indicated that chop bar operators did not practice proper kitchen hygiene. This might be due to unclean eating tables, old and dirty hand towels, usage of common cups, old eating bowls, and poor water for washing hands, among others. Kitchen hygiene involves the cleanliness of work areas, all equipment and tools, the entire kitchen including walls and floors. Leach, Mercer, Stew and Denyer (2001), had also found in their earlier studies that the environment where foods are prepared and sold speaks a lot to customers. The surroundings where food is sold or prepared contributes to the decision of customers to buy the food or not bearing in mind the consequences of eating foods from such environments. Food handlers are a potential source of bacteria and physical contamination of food and so kitchen hygiene is a key element ensuring that food is prepared safely (Panchal, Bonhote and Dworkin, 2013; Sanlier, 2009).

Pests are known to carry a number of pathogenic organisms that can be transmitted to humans through contaminated food therefore serious attention should be on cleanliness since poor hygiene allows germs to enter the kitchen and cause diseases or contamination (Daniels, Daniels, Gilmet and Noonan, 2001). According to Daniel *et al*. (2001), lack of unsafe food handling knowledge contributes so much to food borne illness to consumers of such foods. The majority of the customers checked how neatly and nicely food was presented as their hygiene check before buying food as found in earlier studies (Sienny and Serli, 2010; Leach, Mercer, Stew and Denyer, 2001). This proves that neatness is of essence of customers' choice of place for buying food. Practicing hygiene helps operators to get more customers and increase productivity thereby reducing food borne illness (Leach, Mercer, Stew and Denyer, 2001). The use of gloves for handling cooked food dominated the others. This suggests that the use of gloves for handling food is quiet popular among food handlers. Approximately 10 to 20% of food-borne disease outbreaks are due to contamination by the food handler (Sanlier, 2009).Food handlers play an important role in food poisoning because they may introduce pathogen in to food during production, processing distribution and or preparation. Therefore, in every food service businesses, food handlers should have the skill and knowledge of food safety and hygiene to ensure that food is safe to be consumed by public.

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