

[ACST.2018.2] THE ROLE OF PERSONAL AND PREMISES HYGIENE IN THE ASSUAGEMENT OF FOOD SAFETY IN SELECTED HOTELS WITHIN ELDORET TOWN

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## 2.1 ABSTRACT

*In the last two to three years there have been reported cases of Cholera and other outbreaks related to food which necessitates the need to find out if personal hygiene may have a role to play in all these cases. Consequently, this study was carried out in order to investigate the food handlers' practice of food safety management with respect to personal hygiene, temperature control, prevention of cross contamination, purchasing and storage, food safety training and rules, and kitchen physical features. The study adopted both descriptive and explanatory research designs. Twelve conventional hotels were purposively selected and all 106 food handlers in the hotels were recruited into the study. Data was collected by use of structured questionnaires, interviews and observation. Quantitative data was analyzed with the help of Statistical Package for Social Sciences (SPSS) version 21 and excel. Pearson Chi-square test of independence and Pearson Correlation analysis were performed to test association between the various variables under study. Content analysis was used to analyze qualitative data and results presented in narrative form. The results of the study have been discussed as relates to personal hygiene, temperature control, cross contamination, purchase and storage, following of food safety rules and physical appearance of food safety premises. Conclusions and recommendations have been drawn as pertains to this study.*

**Keywords:** food safety, personal hygiene, food safety management

## 2.2 INTRODUCTION

WHO (2008) defines contamination as “the introduction or occurrence of a contaminant in food environment which causes food to be unsafe. World Bank states that unsafe food contains hazards that can make people sick, either immediately or by increasing their risk of chronic disease and outlines the following among other hazards that receive attention from policy makers: they include microorganisms like *Salmonella*, *Listeria*, *Campylobacter*, or *E. coli* that occur naturally in animals, humans, or the environment. Out of these, reported incidences of foodborne illnesses from microbial pathogens has been on the increase worldwide (The World Bank, 2000). A good example is when in 2017 there were reported three thousand nine hundred and sixty seven (3967) cases of cholera which led to seventy six (76) fatalities (WHO, 2017). Food may be accidentally or deliberately contaminated by microbiological, chemical or physical hazards.

Kitagwa et al., (2012) point out that contaminated food leads to food-borne illnesses which lead to loss of tourism, loss of trade, loss of food, increased health care costs, and loss of productivity which all result in economic losses for a country thus leading to poverty and underdevelopment. Furthermore, Barbara et al., (2012) state that the impacts of food contamination range from thousands of dollars to meet the cost of monitoring analysis, to many millions of dollars due to court prosecutions, bankruptcy, product disposal, compensation for revenue loss, damage to brand or reputation, or loss of life. For example, Marriott (1999) cites Harrington (1992) as reporting that direct costs of food borne illness outbreak can approximate \$75 000 per food service establishment including investigation, clean up, re-staffing and restocking, product loss, settlements and increased regulatory sanctions.

Food safety management includes a number of routines that should be followed by food handlers in order to preserve the quality of food and prevent the food from contamination. Ensuring food safety management entails identifying every potential hazard within a food service operation that could, if left uncontrolled, lead to an outbreak of food-borne illness (Payne-Palacio and Monica Theis, 2012). Yiannas (2009) asserts that ensuring conformance to food safety management by employees begins with creating food safety performance expectations that are clear, achievable, and understood by all.

Mohamady et al., (2012) asserts that concerning personal hygiene, it is recommended that those who come into contact with food either directly or indirectly should maintain an appropriate degree of personal cleanliness and behave and operate in an appropriate manner. This requires the maintenance of records of health status for routine medical checkups and training on personal hygiene so a training tool should be developed. It is also important that product information is provided whereby all food products should be accompanied by or bear adequate information to enable the next person in the food chain to handle, display, store, and prepare and use the product safely and correctly.

### 2.3 PURPOSE OF THE STUDY

The purpose of the study was to establish the role of personal and premises hygiene in assuagement of food safety.

### 2.4 OBJECTIVES OF THE STUDY

- ✚ To determine the role of personal hygiene on Food safety
- ✚ To determine the role of Temperature control on Food safety
- ✚ To determine the role of Cross contamination on Food safety
- ✚ To determine the role of Premises hygiene on Food Safety

### 2.5 THEORETICAL FRAMEWORK

For purposes of this study The Social Cognitive Theory (SCT) was used to anchor the study among other theories. The Social Cognitive Theory (SCT) by Albert Bandura (1977) emphasizes that learning occurs in a social context and that much of what is learned is gained through observation. There are three core concepts at the heart of social learning theory. First is the idea that people can learn through observation. Next is the idea that internal mental states are an essential part of this process. Finally, this theory recognizes that just because something has been learned, it does not mean that it will result in a change in behavior. There are therefore cognitive/personal, behavioral and environmental factors that determine human behavior. The cognitive/personal factors include knowledge, expectations, and attitudes. The behavioral factors include skills, practices, and self-efficacy while the environmental factors include social norms, access in community, and influence on others (Huitt & Hummel, 1999). The purpose of this research therefore, was to establish the role of personal and premises hygiene in assuagement of food safety.

### 2.6 METHODOLOGY

This study was carried out in Uasin Gishu County which is found to the North rift region of Kenya. The study was carried out within selected conventional hotels which are fully serviced and thus have all the major departments of a hotel. A mixed methods research design involving both descriptive and explanatory research designs was used.

The study population involved one hundred and six (106) respondents all of whom were food handlers. The food handlers comprised of cooks/chefs, waiters, assistant cooks, store keepers, purchasing officers, food and beverage managers, and the general managers from the participating hotels totaling 106. As a result a census was done where the whole population was used in the study otherwise other methods of sampling would have given very few numbers to warrant the use of inferential statistics for analysis.

Purposive sampling technique was used to obtain sample size for the hotels in the study within Eldoret town which are classified as conventional hotels. A total of ninety (90) respondents from the 12 hotels participated in the study (by filling in the questionnaires). For the qualitative data, ten hotels were

purposely chosen for observation and ten managers were also purposely chosen from the ten hotels to be interviewed. Data was collected from employees through self administered questionnaires.

The researcher conducted a non participant observation to view operations as they actually occurred on the ground as follows:

Personal hygiene of employees was established by determining whether they had medical examination certificates, by evaluating their level of cleanliness, suitability of clothing worn, the state of their nails, and whether hair was appropriately covered.

Secondly the environment within which staff worked was observed for the following: physical environment in order to determine the availability of separate sinks for hand washing, disposable hand towels or presence of a hand dryer, and running warm water with soap;

Food preparation as possible source of contamination i.e availability of separate rooms for different food preparation, availability of various color coded chopping boards to avoid cross contamination, storage of cooked and raw foods separately, methods of cooling hot foods, holding temperatures, cooking temperatures, and method of thawing frozen foods.

Equipment in terms of cleanliness and maintenance, suitability for use, and usage i.e availability and use of thermometer to check internal temperature of foods, availability and use of gloves, availability and use of differ color coded chopping boards, and availability of various storages with correct temperatures. Lighting and ventilation in the kitchen

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## 2.7 VALIDITY AND RELIABILITY

Validity is the most critical criterion that indicates the degree to which the data collection instrument measures what it is supposed to measure (Kothari, 2004). Content validity was ensured by pre-testing the data collection instrument (the questionnaire) in four hotels in Nandi County which is a neighboring county and therefore is not part of the study area. This study applied the Cronbach's alpha reliability coefficient test to test the reliability of the constructs under study. According to Hair *et al.*, (2005) the general agreed upon lower limit for Cronbach's alpha is  $\geq 0.70$ .

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## 2.8 DATA ANALYSIS

Quantitative data was analyzed with the help of Statistical Package for Social Sciences (SPSS) version 21 and excel then presented in descriptive form using tables and percentages.

Qualitative data analysis was done by use of content analysis and presented in narrative form.

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## 2.9 RESULTS

The study investigated the food handlers' practice of food safety management with respect to personal hygiene, temperature control, prevention of cross contamination, purchasing and storage, food safety

training and rules, and kitchen physical features. Table 4.7 shows the frequency with which food safety is practiced in the hotels.

## 2.10 PERSONAL HYGIENE

From the results, Personal hygiene practices were always observed by 70% of the food handlers according to responses from the questionnaire (Table 4.1). Results attained by observation revealed that not all food handlers wore adequate clothing all the time and no adequate hand washing facilities are available to ensure double hand washing technique. This is contrary to the policy of personal hygiene expected of personnel handling food (Schmidt & Rodrick, 2003; <http://www.foodservice.org>; & US Department of Health and Human Services). Of the hotels (50%) provide a separate hand washing sink, while those that provided the facilities, they lacked soap and hand drying towel. In other hotels, the chef's sink doubled up as the hand-washing sink as well while in others the sink for washing utensils is the same one that is used for washing hands. With the lack of necessary hand washing facilities, it becomes difficult for the foodservice employees to practice proper hand washing (the double hand washing technique). In some cases it was observed that non-food handlers (cleaners) were allowed to handle food.

Table 1: Practice of Food Safety Management (Source: Survey Data, 2016)

Variables	Never (%)	Sometimes (%)	Always (%)
<b>Personal hygiene</b>			
Food handlers wash their hands before beginning work, sneezing, visiting	3(3.6)	14(16.7)	67(79.8)
Food handlers use the double hand washing technique	5(5.7)	21(24.1)	61(70.1)
Food handlers are examined medically after six months	7(8.1)	9(10.5)	70(81.4)
Food handlers wear appropriate aprons, head gear, and footwear	6(7.0)	7(8.1)	73(84.9)
Food handlers are not permitted to handle food when sick from clinically recognized conditions	11(12.9)	5(5.9)	69(81.7)
Temperature control	-	-	-
Internal temperature of held foods are checked every two hours	11(13.3)	29(35)	43(51.8)
Leftover foods are promptly cooled using acceptable methods	16(19.3)	9(10.8)	58(69.9)
Highly hazardous foods are cooked to temperatures >700C	6(7.1)	24(28.6)	54(64.3)
Leftover foods are reheated to temperatures >820C	12(14.3)	25(30)	47(56)
Prepared foods are never held at temperatures between 40 to 1400F	10(12)	24(29)	49(59)
<b>Cross contamination</b>			
Ready to eat foods and raw foods are prepared separately	8(9.6)	5(6.0)	70(84.3)
Work surfaces are sanitized after cutting raw food	6(7.2)	6(7.2)	71(85.5)
Work surfaces are sanitized before Beginning work	7(8.6)	12(14.8)	62(76.5)
Different color coded chopping boards are used for specific jobs	9(11.0)	14(17.0)	59(72)
Ready to eat and raw foods are stored separately	6(7.2)	7(8.4)	70(84.3)
Periodic facility cleaning is done	9(11.0)	10(12.2)	63(76.8)

<i>Variables</i>	<i>Never (%)</i>	<i>Sometimes (%)</i>	<i>Always (%)</i>
<b><i>Purchasing and storage</i></b>			
Food is purchased from approved suppliers	5(6.0)	14(16.7)	65(77.4)
Receiving of supplies is strictly done against specifications	9(10.7)	10(11.9)	65(77.4)
Supplies that do not meet the standards are rejected	9(10.8)	12(14.5)	62(74.7)
Food is stored using FIFO method	12(14.5)	14(16.9)	57(68.7)
Food safety training and rules	-	-	-
Foodservice employees are oriented on FSM rules upon employment	8(9.4)	10(11.8)	67(78.8)
Food safety trainings are organized for food handlers	8(9.4)	15(17.6)	62(73)
Food safety rules are displayed on the notice boards for easy access	17(20.7)	13(15.9)	52(63.4)
<b><i>Physical features</i></b>			
Food preparation areas are well lit and ventilated	8(9.4)	3(3.5)	74(87.1)
Different storage areas have correct temperature readings	7(8.2)	8(9.4)	70(82.4)

In one hotel waiters were observed to be sticking their fingers in the nose while waiting on guests and another waiter was observed to be removing food that was stuck in the teeth with fingers while waiting on guests and in both cases hands were never washed before proceeding with the work. In another instance, waiters were observed to be wiping the chairs and tables as they waited for guests to come and proceeded to attend to guests without washing hands. Infact, they just got a dish towel, wiped the glass and served the guests then proceeded with the wiping as they waited to serve other guests. The rug for wiping food spills from the table was also put in the same service tray for carrying food to the guests.

## 2.11 TEMPERATURE CONTROL

In relation to temperature control measures, fifty eight respondents (69.9%) reported that leftover foods were promptly cooled using acceptable methods (using a wide container to allow the food to cool faster) and fifty four respondents (64.3%) indicated that highly hazardous foods were cooked to temperatures above 70°C. The results also showed that 35% of the respondents reported that the internal temperatures of held foods are not always checked every two hours, 30% of the respondents indicated that leftover foods are sometimes reheated to temperatures above 82°C. There were twenty four respondents (29%) who reported that highly hazardous foods are not always cooked to temperatures above 70°C and also prepared foods are sometimes held at temperatures between 4°F to 140°F. Table 4.8 highlights that only 59% of the respondents reported that prepared foods are never held at temperatures between 4°F to 140°F. This finding was confirmed by the in-depth interview and observation in the hotels where it was found out that there is a bit of negligence when it comes to the control of temperature in food. For example, foods that were served for buffet were not kept at recommended temperatures. The foods were actually warm.

Further observations ascertained that the necessary equipment are lacking for the food handlers to ensure proper temperature control. However, half (50%) of hotels had adequate storage facility with thermometers temperature readings (plate 4.6 & 4.7). Some freezers and refrigerators did not have



temperature readings and so it became difficult to ensure proper storage temperatures. This may lead to food going bad and especially when power goes off for those hotels that do not have generators. Only one hotel had a generator in case of emergency. In one hotel the manager said that they ensure that they have ice blocks to put in the freezers at night to take care of emergency power black outs so that their food does not go bad (PW).

When it comes to thawing of frozen foods, five (50%) of the hotels thawed frozen foods using acceptable standards (either using cold water or putting the food to thaw overnight in the refrigerator) while others used other unacceptable means such as leaving the food on the counter overnight, putting in hot water or microwaving. All the hotels cooled leftover foods properly as recommended. However, holding temperatures were quite inadequate as only one (10%) of the hotels was observed to have held hot and cold foods at the appropriate temperatures. Storage temperatures were also observed to be not appropriate in most of the hotels. For instance, only five (50%) of the ten hotels observed had thermometers on their correct refrigerators, two (20%) had thermometers in the cold room, five (50%) had correct freezer temperature. Seven (70%) of the hotels had the correct temperatures for dry goods storage.

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## **2.12 PREVENTION OF CROSS CONTAMINATION**

Regarding cross contamination prevention, seventy-one respondents (85.5%) reported that work surfaces were sanitized after cutting raw food, seventy respondents (84.3%) reported that ready to eat and raw foods were prepared separately and also stored separately. However, fourteen respondents (17%) indicated that different color-coded chopping boards are not always used. This is because those boards are not there since some of the hotels only a few boards and therefore the food handlers were forced to share.

These results were complemented with the observations that the researcher did to verify the practice of cross contamination prevention and the findings are presented in table 4.9.

Results of the study indicated that only one hotel (10%) had separate rooms for preparation of the various food items and only two (20%) hotels stored raw and cooked foods separately. Furthermore, most hotels (80%) had foods prepared in the same room though with designated areas for specific tasks and one hotel (10%) used the same table for various tasks with imaginary lines to distinguish which section should be used for various tasks. One hotel (10%) did not even designate any space for different tasks but any food was prepared in any available space on the same table since different food items were prepared at different times as was reported by the chef. 80% of the hotels stored foods using FiFo method, and seven hotels (70%) had separate color-coded chopping boards for different activities.

Other than inadequate food preparation and storage areas in most of the hotels, three (30%) of the hotels did not have appropriate working surfaces whereby work surfaces were not made of the right material (non-absorbent and inert materials – stainless steel) and in some cases the work surfaces were joined with nails, while in other situations joinery sections were not continuous and had rust and some surfaces

were made of chipped formica. One hotel (10%) even had a log of wood in the butchery for cutting meat.

Observation made in the hotels revealed that six of the hotels that had separate storage for raw and cooked foods, most of them (3 hotels) had raw foods stored together with cooked foods with some foods uncovered, other stores had food together with other things like cleaning detergents and steel wool and spirit, some foods were kept on the floor, and others stored food in the filing room. Only 1 (10%) hotel had distinct and separate areas for food storage. The rest of the hotels had cooked food being stored together with raw food either in the cold room or in the refrigerator while in other cases food items were not covered besides being put on the floor. Furthermore, eight of the managers interviewed reported that they did not recycle their leftover foods but instead gave it to their workers as part of their meals while at work.

Despite all the hotels (100%) under study having different color-coded chopping boards for various tasks, washing them after use was not thoroughly done and this could be a big source of contamination as well as cross contamination.

Observation made also revealed that food contamination can easily occur because of the presence of flies and cockroaches in a number of hotels under study. They were present on food preparation surfaces and even dining tables in the restaurant a clear indication to lack of hygiene.

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### **2.13 KITCHEN PHYSICAL ENVIRONMENT**

Regarding kitchen physical features, majority of the respondents (87.1%) indicated that food preparation areas were well lit and ventilated and 82.4% of the respondents reported that different storage areas had correct temperature readings. This result was supported by the observation made in that most of the hotels had storage areas especially freezer storages with correct temperature reading below 00C. However, the other storage areas such as the cold room did not have correct temperatures readings

Observation also revealed that the hand washing facilities and food preparation areas in most of the hotels were inadequate. Despite 80% of the hotels having separate sinks for hand washing, did not have soap and hand driers/towels. Only one (10%) hotel had soap. One supervisor reported that the foodservice workers are expected to take a shower upon arrival and so did not see the need of having a hand-washing facility (PW).

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### **2.14 CONCLUSION**

In conclusion the study was able to establish that there was a significant difference between results obtained by self-administered questionnaire compared to results obtained through observation. For instance, on personal hygiene not all food handlers wore correct uniform as per expectations, there were inadequate hand washing facilities and there was poor observation of hygiene rules expected of food service personnel



Results on temperature control confirmed that most establishments lacked something as basic as a thermometer whose main use is to take internal temperature of food as it cooks in order to ensure food borne bacteria are destroyed and also to measure refrigeration temperature.

As appertains to cross contamination it was observed that there were no separate sections for preparation of raw food such as meat which has to be cooked to be consumed and a section for preparing food which is eaten raw such as vegetable salad.

Lastly as relates to premises hygiene, it was observed that there was the presence of both flies and cockroaches which is a testament to the low standards of premises hygiene.

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