

A faint, light blue world map is visible in the background of the top half of the cover.

International Journal of **Food Science** (IJF)

**ROLE OF FOOD MANAGEMENT SYSTEMS ON FOOD
SAFETY IN HOTELS**

Alfred Mutua



CARI
Journals

ROLE OF FOOD MANAGEMENT SYSTEMS ON FOOD SAFETY IN HOTELS

¹Alfred Mutua,

Department of Food Science, University of Nairobi

*Corresponding author's Email: Mutua127@gmail.com

Abstract

Purpose: Food is an essential part of life, but if it is contaminated it can cause illness even death, and food can be contaminated with toxic substances from outside or even it is already in the food itself. Food safety synonymous with food hygiene embracing anything in the processing, preparation or handling of food to ensure it is safe to eat. The general objective of the study was to the study was to establish role of food management systems on food safety in hotels.

Methodology: The paper used a desk study review methodology where relevant empirical literature was reviewed to identify main themes and to extract knowledge gaps.

Findings: The study found out that application of standard food safety systems, compliance to food safety system and implementation of food safety system impact the provision of safe food in hotels.

Recommendations: The study recommends that that application of standard food safety systems led to the provision of safe food in hotels. The study recommends that all hotels meet requirements to ensure the safety of foods. The proliferation of laws and regulations to food safety management system standards are the response to concerns of the hotel management. Developments in food safety regulation spark a move towards a more strict approach to food safety. A range of laws, acts, regulations, norms and directives addressing a variety of different aspects in food hygiene, should be enforced by relevant authorities.

Keywords: *role, food management systems, food safety, hotels*

1.0 INTRODUCTION

1.1 Background of the Study

Food service establishments are a major source of food borne illnesses and food handling contributes to food borne illness outbreaks (Brkti, Dejen, & Lalit, 2015). Negligence of food safety practices, in food establishments, enables pathogens to grow and contaminate food. Research has shown that most of the outbreaks are caused by failure to attend to sufficient safe practices. According to (Angulo & Timothy, 2015), studies of both sporadic and outbreaks associated illnesses suggest that restaurants are an important source of foodborne illnesses in the USA. A common denominator in the hotels is the dependence on manual processes in food production and service resulting in increased numbers of food handlers. Researchers have focused on the role of the food handler, in attempting to determine the reasons for these outbreaks, and findings indicate that indeed the role of the food handler is significant (Githiri, Kimiywe, & Okemo, 2013). (AbdulMutaib, et al., 2012) and (Jenie, Nor, & Sharif, 2015), identify the contribution to foodborne outbreaks as lack of knowledge of food hygiene safety during preparation, processing and storage.

A study done in Ankara, Turkey, Mekelle and Bahir Dar towns in Ethiopia indicated that knowledge of food handling is significantly related with food handling practices (Abera & Kibret, 2012) (Kumie & Nigusse, 2012). However, food handling practices was associated with educational status of food handlers (Dawale, Goyal, Mudey, & Wagh, 2010), (Dey & Rabbi, 2013), in a study done in Nigeria, Bangladesh, and central India. Whereas, study done in Nigeria and Kenya, showed that type of premise, unclean equipment and work responsibility were factors affecting food handling practices (Havelaar, et al., 2013). Based on the results of these studies, it is hypothesized that improving food handlers' food safety practices would result in a direct improvement in food safety. A food safety system is viewed as the documented and prescribed system for controlling against exposure to risk or impairment. Nevertheless, the specification of an organization's documented system essentially does not reflect the organization's practice. It is the safety culture of the organization that will prompt the development, operation and efficiency of the management safety policies, procedures and practices, as it embodies the work environment and attitudes employee's practice at all levels (Griffith, Jackson, & Lues, 2017).

Provision of safe food is highly dependent on mode of food management practices (FontannazAujoulat, Frost, & Schlundt, 2019). Food management practices include handling practices, application of standard food safety systems, compliance to food safety system and implementation of food safety system in the provision of safe food (Gibson, Kniel, & Riggio, 2019). Likewise, poor food management practices could results in the transmission of food poisoning, as pathogens may be introduced into food during production, processing, distribution and even presentation (Zayed, 2017). An understanding of food safety procedures and potential factors that cause food contamination is very important for all food handlers (Mohd Firdaus, Son, Mohhiddin, Toh, & Chai, 2015). Contamination of food owing to limited knowledge of food safety practices primarily increases the risk of food borne illnesses.

Food safety management systems include a number of procedures that should be adhered to by food handlers in order to keep food safe by preventing contamination (Payne-Palacio & Theis, 2012). Ensuring food safety management entails identifying every potential hazard within a food service operation and taking proper measures to prevent food contamination. Food safety management will ensure that consumers are not subjected to unsafe food thus ensuring healthy lives and promoting well-being of everyone. (Zayed 2017) asserts that ensuring conformance to food safety starts with generating food safety performance expectations that are well-defined, achievable, and understood by all. This means that the parties involved in food management need to know what is expected and what must be done to preserve food safety.

An efficient food safety management system is crucial in the food service operation, to ensure that safe services, particularly safe food is delivered to customers. This is not just a proficiency to be developed but a value that should be instilled in the entire hotel industry. According to (Perez & Manzano, 2017), there are three principle components of a food safety management systems; person, environment, behavior. This means that facilities should be planned with food safety and sanitation in mind and they must comply with all relevant regulatory standards. The correct equipment should be chosen for the right job and employees should be provided with the appropriate tools necessary to do their work if food safety management is to be effected.

(Mohamady, Essam, & El Kashlan, 2012), proposed a food safety management framework based on Codex Alimentarius by FAO and WHO which integrates internationally recognized and globally applicable food safety and quality management standards at different stages of the food safety management. The Codex Alimentarius recommends six general principles of food hygiene which include facility, operation control, maintenance, sanitation, personal hygiene, product information, and training. (Manzano, 2013), conducted a study on Competency-Based Modules in Food Sanitation and Safety. The study was conducted to assess the food safety practices among food service establishments in order to increase awareness among students of the dangers of food poisoning. The study used the descriptive method research. Supervisors of selected fast-food chains and deluxe hotels in Manila were the respondents of the study. Food service establishment have the paramount responsibility of the safety of consumers and as such to prevent the outbreak of food borne illnesses and intoxication, standards, procedures and guidelines are developed. However, food sanitation and safety will be meaningless if these standards, procedures and guidelines are not study implemented through education, training and dissemination of information among the personnel. Moreover, most hotel and restaurants lack or do not follow proper food management practices

Food safety according to HACCP framework entails practice of ensuring that food causes no harm to the consumer. According to HACCP framework, provision of safe food entails protection of the food supply from harmful contamination, prevention of the development and spread of harmful contamination and effective removal of contamination (Ghezzi, 2017). Safe food provision calls for proper handling, preparation, and storage of food in ways that prevent food-borne illness. According to WHO (2015) safe food provision food aims at ensuring that all food is as safe as possible and outlines the five key principles of food hygiene which should be observed by all food

handlers. These five keys to safer food include: keep clean, separate raw and cooked; cook thoroughly, keep food at safe temperature; use safe water and raw materials. Food handlers should ensure personal hygiene which includes issues such as washing hands prior to handling food and washing hands especially after going to the toilet, washing and sanitizing all surfaces and equipment used for food preparation, protecting kitchen areas and food from insects, pests and other animals (Temesgen & Abdisa, 2015). Food safety is a critical issue that should be implemented and monitored in all aspects of food delivery to the general public (Admasu & Kelbessa, 2018). Patrons at restaurants, hotels and other eating outlets are at risk if the appropriate food safety procedures are not employed, thereby placing a huge responsibility for management to oversee and carry out food safety procedures in their establishment.

1.2 Statement of the Problem

Observing high safety standards and handling procedures, food consumed in restaurants of hotels, in an ideal situation, should be unblemished. Maintaining safe food should start at the farm where it is produced, transported in safe materials, stored in safe environment with proper range of temperatures, prepared and cooked in clean environment, handled and served in clean utensils. Moreover, the persons handling food and serving to the customers must observe the highest level of food safety guidelines that include wearing clean protective clothing, at the beginning of each shift and change them daily or as regularly, when necessary. Food safety is a specific aspect of food quality and is expressed as the reassurance that food will not cause injury to the consumer when it is prepared and/or eaten in accordance with its intended use. Contaminated food can, and does result in food poisoning if not guarded against hazards and can do more harm to the eater than the good it is intended. Depending on the severity of the poisoning, it can result in either illness or death (Adebitan, Khayiya, & Mugambi, 2014).

Botches in food safety can have devastating effects for public confidence, human life and the wider economy. People may become sick if they consume food that has been contaminated by bacteria because of poor food hygiene, or if they eat food that is contaminated through poor handling. However, in the recent past, there have been press reports of a number of cases related to food borne illness and the increased visibility of such cases highlights food safety in hotels. Most hotels lack clear guidelines on food safety management systems (Oloo, 2010). Moreover, most hotels lack proper facilities to enhance food safety: Food storage facilities, food preparation and production equipment and service tools (WHO, 2015).

Following the huge numbers of customers served, service utensils may be inadequate and so is the service team, hence replenishing clean service equipment as fast as required may be a challenge posing a high risk of re-using plates and spoons without proper washing with clean hot detergent water as recommended by food hygiene practices (Perez & Manzano, 2017). Moreover, a common denominator in the hotels is the dependence on manual processes in food production and service resulting in increased numbers of food handler (Githiri, Kimiywe, & Okemo, 2013). As such, most of the food production and service staff may lack or have very little knowledge on food safety from the most junior to senior staff. More emphasis is put on mass production with little attention to the conditions under which food is prepared and served. In addition, there may be lack of adequate

and proper facilities to enhance food safety: Food storage facilities, food preparation and production equipment and service tools (Nyabera, Muzhingi, & Abong, 2018). Previous studies have implicated food handlers and have shown improper food practices to be a significant origin of most of these cases (Akonor & Akonor, 2013).

This can be attributed to non-compliance with food hygiene practices, in handling food by the food handlers and in maintaining standards of food hygiene as prescribed. Food safety requires management intervention and it is the responsibility of the hotel management to develop, implement and monitor systems that ensure employees carry out their food handling tasks effectively and within the acceptable safe food handling standards. Though there is a general assumption that safe food handling practices are applied particularly in hotels, there is limited empirical evidence to this effect. Further, there exists limited data relating to role of food management systems on food safety in hotels prompting the need for this study.

1.3 Objectives of the Study

The general objective of the study was to establish role of food management systems on food safety in hotels.

1.4 Justification and Significance of the Study

The study findings are useful to food safety regulators and policy makers. The results will be of significant to Departments of Public Health (DPH) globally since it is mandated in overseeing that safe food is served in hotels. Department of Public Health should periodically evaluate state of food served by various hotel outlets in respective countries. The results are of significant importance to the Ministry of Tourism. Health concerns associated with international and domestic tourism are receiving increased attention by the tourism industry and must be addressed sufficiently by promoting food safety. Ministry of Tourism in conjunction with hotel service providers shall formulate food safety guidelines that must be observed in ensuring that safe food is served to tour guests and visitors. The results findings of the study will be significant to hotels. Hoteliers will benefit from the understanding of their social responsibility of safeguarding public health through their operations. The results points out proper food handling process that can be employed by hotels to enhance food safety. The recommendations on food safety provisions emanating from the results of the study will be essential to hoteliers and other hospitality establishments. It is intended that the study will encourage compliance with hygiene and sanitation standards in hotels and will assure public health through hygienic food preparation. This compliance will lead to prevention of food contamination or sanitation-related food borne illness outbreaks. The results of the study will form basis for future reference to scholars in food management systems and food safety. The scholars will be able to relate how different hotel service providers are involved in the implementation of food safety measures. The study will shed more light on standards, systems and policy on future direction of inquiry in food safety. The research also add into the existing literature related to establish role of food management systems on food safety in hotels.

2.0 LITERATURE REVIEW

2.1 Theoretical review

Two theories were found to be relevant in establishing role of food management systems on food safety in hotels. The theories that were found to best inform the research constructs are theory of planned behavior (Ajzen, 2011) and Food Systems theory (Ericksen, 2008).

2.2.1 Theory of planned Behavior

Theory of planned Behavior (Ajzen, 2011) suggests that behaviour is determined by behavioural intention. Intention to act is assumed to capture the motivational factors that influence a behavior and are indications of how much of an effort an individual is planning to exert, in order to perform the behavior (Mullan, Wong, & Kothe, 2013). In turn, intention is predicted by three variables – attitude, the overall evaluation of the behaviour; subjective norm, which represents the perceived pressure from significant others to perform the behaviour; and perceived behavioural control (Mullan & Wong, 2010). Theory of planned Behavior is a component that represents the individual's perceptions of the ease or difficulty of performing the behavior of interest (Phillip & Anita, 2010). (Ajzen, 2011), contended that Theory of planned Behavior directly influences both intention and behaviour for behaviours that are under volitional control.

According to this theory, a person's intention is a function of two basic determinants, one personal in nature and the other reflecting social influence (Ajzen, 2011). In the area of food safety, the Theory of planned Behavior can be used to predict of intention and application of safe food management practices. Theory of planned Behavior has been found to be the strongest predictor of intention to handle food hygienically; however, it did not directly predict behaviour. As aforementioned, Theory of planned Behavior was the most significant predictor of safe food handling intention and a significant predictor of intention for hand hygiene practices. Therefore, interventions aimed at increasing PBC, which includes both a self-efficacy and a controllability component, may assist in increasing both intentions and safe food handling behaviour.

2.2.2. Food Systems theory

Food Systems theory by Ericksen (2008) which states that: "A food system is as a set of dynamic interactions between and within the biogeophysical and human environments and include a number of activities leading to a number of associated outcomes." Food systems comprise a set of activities and outcomes ranging from production through to consumption, which involve both human and environmental dimensions. Food systems are often described as comprising four sets of activities: those involved in food production, processing and packaging, distribution and retail, and consumption. All these activities encompass social, economic, political, and environmental processes and dimensions. A food ,...system can be more broadly conceived as including the determinants (or drivers) and outcomes of these activities. The determinants comprise the interactions between and within biophysical and human environments that determine how food system activities are performed. These activities lead to a number of outcomes, some of which contribute to food security and others that relate to the environment and other societal concerns. These outcomes are also affected directly by the determinants. Food security is the principal policy

objective of a food system (Ericksen, 2008). Food security outcomes are described in terms of three components and their subcomponents: food availability (production, distribution, and exchange); food access (affordability, allocation, and preference); and food utilization (nutritional and social values and food safety). Although the food system activities have a large influence on food security outcomes, these outcomes are also determined directly by socio-political and environmental drivers. These outcomes vary by historical, political, and social context. By specifically linking activities to outcomes, the food system approach helps understand both linear and non-linear links between activities as part of the outcome analysis (Ericksen and Ingram, 2005). Food systems may or may not result in food security for the unit of analysis of concern; in this case the household.

2.2 Empirical Review

Oduol, (2020) conducted a study to evaluate the role of food safety management systems on food safety in 5 star hotels in Nairobi City County. The specific objectives were to; evaluate the application of standard food safety systems on food safety in the 5-star hotels in Nairobi City County, determine the effect of compliance to food safety system on food safety in the 5-star hotels in Nairobi City County and establish the effect of implementation of food safety system on food safety in the 5-star hotels in Nairobi City County. The study adopted cross-sectional survey design. Nairobi City County has several classified hotels located conveniently and the research surveyed 5-star hotels. Research instruments used include, questionnaires, interview schedule and observation checklist. For this, food handlers and managers were targeted. Descriptive statistics were used to analyze the data and findings presented in figures, tables, narrative and descriptive forms. Paired t-test results established that there is statistically significant change in provision of safe food as a result of applying food safety practices, complying with food safety procedures and implementing food safety systems. Regression results showed that application of standard food safety systems had a positive and statistically significant relationship with food safety of hotels in Nairobi City County ($\beta=.202$, $p = .012$). It was also established that compliance to food safety system had positive and statistically significant relationship with food safety ($\beta=.214$, $p = .000$). Further, implementation of food safety system had a positive and statistically significant relationship with provision of safe food in Nairobi City County ($\beta=.318$, $p = .001$). From the study findings, it was concluded that application of standard Food safety systems, compliance to food safety system and implementation of food safety system impact the provision of safe food in hotels. From the study findings, it was concluded that application of standard Food safety systems, compliance to food safety system and implementation of food safety system impact the provision of safe food in hotels. The study recommends that regulatory agencies in Nairobi City County focus on a more proactive approach to food safety compliance by records verification rather than product testing and developments in food safety regulation based on HACCP principles spark a move towards a more strict approach to food safety. While Hotels should observe proper food safety handling procedures with close monitoring and supervision of the state of food offered in hotels to ensure the safety of food.

Kariuki,(2012) conducted a study that sought to assess the food handling practices and the prevalence of food borne study illness amongst the food handlers in Embu Municipality. Both random and systemic sampling procedures were used to identify food handlers to be included in the study as they attended routine medical examination. Stool specimens were taken for microscopic analysis for ova and cysts; using Ritches modified formal ether stool concentration method and culture for bacterial investigations. Knowledge on food borne diseases, sociodemographic factors and food handling practices were evaluated using pre-tested structured questionnaires. The results that food borne illness and food handling practices were still a public health problem in Embu Municipality, seventy (28.9%) of the food handlers were infected with *Salmonella typhi* and ten (4.1) with *Entamoeba histolytica*. Significant differences ($\chi^2 = 6.86$; $p < 0.05$; $df = 1$) were noted in the prevalence of *Salmonella typhi* among food handlers who were 30 years old and below and those above 30 years. Over 50% of the food handlers had high knowledge and understanding of the food borne illnesses, their symptoms, causes and preventive measures. Significant differences $\chi^2 = 9.26 < 0.05$; $df = 1$) were noted between those with secondary education and above and those with primary education and below on the knowledge of specific food borne illnesses. Compliance with food handling practices and health measures as laid out in the Public Health Act Cap 242 and the Food, Drugs and Chemical Substances Act Cap 254 laws of Kenya was not satisfactory. About 42% of the food handlers had no valid medical certificates, 21% without protective garments and even among those who had them, (31.5%) were dirty. Among the cooks, 76.6% did not have head covers. Touching of foods with bare hands was observed in 55.1% of the food handlers, while 42% did not wash hands after touching raw foods. Most cashiers, (64%) were found handling food after handling money without washing hands. Significant differences ($\chi^2 = 37.06$; $p < 0.001$; $df = 1$) were noted between those who washed hands before touching foods in high and low class eating houses. Though most of the premises were provided with refuse containers, the majority (71.9%) of the containers were without refuse covers. Food borne illnesses and food handling practices are still a major threat to public health in Embu Municipality. Measures should be undertaken by the Government to ensure effective and efficient enforcement of the Public Health Act Cap. 242 and The Food Drugs and Chemical substances Act Cap. 254 and training of food handlers. Results of this study will be useful to public health managers in their effort towards improvement of public health.

Icheria (2012), conducted a study that sought to investigate household food insecurity and coping strategies among small scale farmers in Tharaka Central Division of Tharaka South District, Kenya. The specific objectives of the study were to: Establish the status of household food production among small scale farmers in Tharaka Central Division; determine household food consumption patterns; establish household food sources, establish the status of household food insecurity and identify coping strategies among the households in the event of food shortage. The research design employed in the study was cross sectional descriptive survey which sought to obtain information that was to describe the existing status of household food insecurity and coping strategies among the small scale farmers. A total of 351 small scale farmers' households were systematically sampled from the total population of 3631 small scale farming households in the division. Data was collected by use of structured questionnaire, observation checklist and key

informant interview guide. Data analysis was done using SPSS (Version 11.5) computer software program. Frequency tables, pie charts, bar graphs and line graphs are used to present the findings of the study. Mean farmland sizes was 1.62 acres, food crops were cultivated at 95% of the total crop, the major months of adequate and inadequate food provisioning were June to August (40.5%) and October to January (30.2%) respectively. Crop loss was mitigated by planting drought resistant crops. Household dietary diversity score (HDDS) of the previous 24 hours was low (83.3%) while 50.7% had acceptable household food consumption score (HFCS) in the previous 7 days of food consumption. The primary source of maize was the market at 36.7%. Majority of households (44.7%) were food insecure, 43.3% vulnerable to food insecurity and 12% food secure. Reduction in size of meals was the major coping strategy. There were significant positive relationships between sizes of farms and sizes of farmlands ($r = 0.653$, $p = 0.000$); between HFCS and farmland size ($r = 0.299$, $p = 0.0000$); significant difference between maize expected and maize harvested ($t = 22.927$, $p = 0.000$). There was also significant positive association between HDDS and HFCS ($t = 13.463$, $df = 4$ and $p = 0.009$). sources of maize and the statuses of household food insecurity ($\chi^2 = 60.895$, $df = 6$, $p = 0.000$). Low food characterized by low HDDS, and coping strategies were not detrimental to developed through community-based participatory actions; and the GOK through implement them in all ASAL areas to alleviate household food insecurity.

Kilungu,(2012) conducted a study on the hygienic and sanitary practices of vendors of street foods in Kayole and Dandora estates in Nairobi was carried out using a descriptive survey design. A sample size of 80 street food vendors each selling mutura, roasted maize, chips, mandazi, fruit salads, githeri, fish and sausages in the two estates was selected. Data were collected using indepth interviews and observation checklists. Sixty street food consumers and two Public Health Officers were interviewed in the area of study. Data were analysed using statistical package for social sciences (SPSS), descriptive statistics such as means and frequencies were used, Chi Square and ttests were used to establish relationships between sex and hygienic and sanitary practices and differences between sex and income from street food vending. Information generated from the study showed that vendors had no training on food preparation skills. About 62% of the street vendors acquired preparation skills through observation while 33% were taught by their parents. The working surfaces used for preparation of raw foods were not washed regularly. Cooked foods were stored at ambient temperature in cupboards, plastic bowls and others were just left in the open uncovered. Vendors washed utensils using water in buckets and they were rinsed once, the rinse water was used severally before replacement. Eighty-five percent of the vendors had garbage and waste dirty beside the food stalls. Most of the vendors had no aprons, they handled food with their bare hands and their heads were not covered. When packaging the foods vendors uses air from their mouth to blow the polythene bags to open them before placing the food in them. Results showed that 7% of the consumers suffered from diarrhoea while 38% suffered from stomachaches due to the consumption of street foods. Sixty-five percent of the consumers believed that the street food vendors did not observe proper hygiene and sanitation. Public Health Officers found it hard to inspect the vendors because no code of practice had been developed for street foods, by the authorities. They found the existing laws on food establishments inadequate for street vendors who operated under different circumstances. They indicated that street food industry is a new vocation,

which provides job opportunities for urban dwellers hence the government should recognize it and give the necessary support for the improvement of the industry. The results of this study suggest that there is a need to establish street food centres by the councils and to train street food vendors on hygiene and sanitation aspects. In addition, there is a need to establish a code of practice for street food industry and empowerment of public health officers.

Adero,(2014) conducted a study to establish compliance to food safety since food handling is a significant route through which food is contaminated and as a result food borne illnesses occur. The study focused on the knowledge, attitude and practices of food handlers, compliance to food safety measures at various critical control points and presence of *E. coli* or *Salmonella* in food or work surfaces as indicator organisms. To achieve these objectives, the study utilized cross sectional study design. Data was collected by use of a structured questionnaire and analyzed using Predictive Analytical Software. In addition, food samples and surface swabs were collected and analyzed in the laboratory. The study found out that while food handlers exhibited adequate attitude (mean= 69%) and practices (77.3 (Yo) on food safety and hygiene, their knowledge on food safety and hygiene fell below average (mean= 67). The inadequate knowledge on food safety and hygiene was linked to lack of training of food handlers with 75.9% not having attended any food safety training and only (32.4%) had attended refresher courses in the past five years. Also, implementation of food safety measures at various critical control points were related to the knowledge, attitude and practices of food handlers. *E. coli* was isolated from 14.4 % of food samples and 13% of swab samples collected from work surfaces. There was no *Salmonella* in both food and work surfaces. Contamination of food was attributed to inadequate knowledge among food handlers, cross contamination, time and temperature abuse between the periods of cooking, service and handling of left over food. The findings of this study is a clear indication that food cooked for children in preprimary schools and daycare centers is contaminated with *E.coli* and it is possible that food is also contaminated with other microorganisms which thrive in the same environment with *E.coli*. As well, majority of food handlers are not equipped with adequate knowledge to handle food safely in addition to lack of HACCP systems in most pre-primary schools and daycare centers. The study therefore recommends that food handlers be trained on food safety to boost their knowledge and improve their attitude and practices. It is also recommended that the pre- primary schools and daycare centers implements the HACCP system in their operations

2.3 Research gaps

Geographical gap is a knowledge gap that considers, the untapped potential or missing/limited research literature, in the geographical area that has not yet been explored or is under-explored. For instance, Kariuki (2012), conducted a study that study sought to assess the food handling practices and the prevalence of food borne study illness amongst the food handlers in Embu Municipality. Both random and systemic sampling procedures were used to identify food handlers to be included in the study as they attended routine medical examination. Significant differences ($\chi^2 = 6.86$; $p < 0.05$; $df = 1$) were noted in the prevalence of *Salmonella typhi* among food handlers who were 30 years old and below and those above 30 years. Over 50% of the food handlers had

high knowledge and understanding of the food borne illnesses, their symptoms, causes and preventive measures. Significant differences $\chi^2=9.26<0.05$; $df=1$) were noted between those with secondary education and above and those with primary education and below on the knowledge of specific food borne illnesses. The study presented a geographical gap as it was done in Embu Municipality while our current study sought to establish role of food management systems on food safety in hotels.

Methodological gap is the gap that is presented as a result in limitations in the methods and techniques used in the research (explains the situation as it is, avoids bias, positivism, etc. Oduol, (2020) conducted a study to study to evaluate the role of food safety management systems on food safety in 5 star hotels in Nairobi City County. The study adopted cross-sectional survey design. Nairobi City County has several classified hotels located conveniently and the research surveyed 5-star hotels. Research instruments used include, questionnaires, interview schedule and observation checklist. Paired t-test results established that there is statistically significant change in provision of safe food as a result of applying food safety practices, complying with food safety procedures and implementing food safety systems. The study presented a methodological gap as it was subjected to cross-sectional survey design while our current study adopted a desktop literature review method.

Conceptual gap arises because of some difference between the user's mental model of the application and how the application actually works. Icheria (2012), conducted a study that sought to investigate household food insecurity and coping strategies among small scale farmers in Tharaka Central Division of Tharaka South District, Kenya. Data was collected by use of structured questionnaire, observation checklist and key informant interview guide. Data analysis was done using SPSS (Version 11.5) computer software program. Frequency tables, pie charts, bar graphs and line graphs are used to present the findings of the study. There was also significant positive association between HDDS and HFCS ($\chi^2=13.463$, $df=4$ and $p=0.0091$). sources of maize and the statuses of household food insecurity ($\chi^2=60.895$; $df=6$, $p=0.000$). The study presented a conceptual gap as investigated household food insecurity and coping strategies among small scale farmers in Tharaka Central Division of Tharaka South District, Kenya while our current study will focus on role of food management systems on food safety in hotels.

3.0 METHODOLOGY

The study adopted a desktop literature review method (desk study). This involved an in-depth review of studies related to role of food management systems on food safety in hotels. Three sorting stages were implemented on the subject under study in order to determine the viability of the subject for research. This is the first stage that comprised the initial identification of all articles that were based on role of food management systems on food safety in hotels from various data bases. The search was done generally by searching the articles in the article title, abstract, keywords. A second search involved fully available publications on the subject on role of food management systems on food safety in hotels. The third step involved the selection of fully accessible publications. Reduction of the literature to only fully accessible publications yielded specificity and allowed the researcher to focus on the articles that related to role of food

management systems on food safety in hotels which was split into top key words. After an indepth search into the top key words (role, food management systems, food safety, hotels), the researcher arrived at 6 articles that were suitable for analysis. The 5 articles were findings from Oduol, (2020) who conducted a study to evaluate the role of food safety management systems on food safety in 5 star hotels in Nairobi City County. The study adopted cross-sectional survey design. Nairobi City County has several classified hotels located conveniently and the research surveyed 5-star hotels. Research instruments used include, questionnaires, interview schedule and observation checklist. Paired t-test results established that there is statistically significant change in provision of safe food as a result of applying food safety practices, complying with food safety procedures and implementing food safety systems.

Kariuki,(2012) who conducted a study that sought to assess the food handling practices and the prevalence of food borne study illness amongst the food handlers in Embu Municipality. Both random and systemic sampling procedures were used to identify food handlers to be included in the study as they attended routine medical examination. Significant differences ($\chi^2 = 6.86$; $p < 0.05$; $df = 1$) were noted in the prevalence of Salmonella typhi among food handlers who were 30 years old and below and those above 30 years. Over 50% of the food handlers had high knowledge and understanding of the food borne illnesses, their symptoms, causes and preventive measures. Significant differences ($\chi^2 = 9.26 < 0.05$; $df = 1$) were noted between those with secondary education and above and those with primary education and below on the knowledge of specific food borne illnesses.

Icheria,(2012) who conducted a study that sought to investigate household food insecurity and coping strategies among small scale farmers in Tharaka Central Division of Tharaka South District, Kenya. Data was collected by use of structured questionnaire, observation checklist and key informant interview guide. Data analysis was done using SPSS (Version 11.5) computer software program. Frequency tables, pie charts, bar graphs and line graphs are used to present the findings of the study. There was also significant positive association between HDDS and HFCS ($\chi^2 = 13.463$, $df = 4$ and $p = 0.0091$). sources of maize and the statuses of household food insecurity ($\chi^2 = 60.895$; $df = 6$, $p = 0.000$).

Kilungu, (2012) who conducted a study on the hygienic and sanitary practices of vendors of street foods in Kayole and Dandora estates in Nairobi was carried out using a descriptive survey design. A sample size of 80 street food vendors each selling mutura, roasted maize. Chips, mandazi, fruit salads, giiheri, fish and sausages in the two estates was selected. Data were collected using indepth interviews and observation checklists. Sixty street food consumers and two Public Health Officers were interviewed in the area of study. They found the existing laws on food establishments inadequate for street vendors who operated under different circumstances. They indicated that street food industry is a new vocation, which provides job opportunities for urban dwellers hence the government should recognize it and give the necessary support for the improvement of the industry.

Adero, (2014) who conducted a study to establish compliance to food safety since food handling is a significant route through which food is contaminated and as a result food borne illnesses occur.

Data was collected by use of a structured questionnaire and analyzed using Predictive Analytical Software. In addition, food samples and surface swabs were collected and analyzed in the laboratory. The findings of this study is a clear indication that food cooked for children in preprimary schools and daycare centers is contaminated with E.coli and it is possible that food is also contaminated with other microorganisms which thrive in the same environment with E.coli

4.0 SUMMARY, CONCLUSION AND POLICY IMPLICATION FOR FURTHER STUDY

4.1 Summary

Storage conditions of all food also had a positive and significant relationship with food safety while protection from contamination - away from chemicals, physical and biological contaminants also had a positive and significant relationship with food safety. Food storage premises should be clean and of correct temperatures and humidity. Storing food the right way can be a great help in ensuring food safety in hotels. Poor storage conditions may result to food spoilage. Proper food storage helps to preserve the quality and nutritional value of the foods purchased, and also helps make the most of the food dollar by preventing spoilage. Hotels that applied food safety standards provided safe food as compared to those that did not.

4.2 Conclusion

From the study findings, it is concluded that application of standard food safety systems, compliance to food safety system and implementation of food safety system impact the provision of safe food in hotels. The study found that that there is statistically significant improvement in food safety as a result of applying food safety systems. The study therefore concludes that applying food safety systems leads to the provision of safe food in hotels. Implementing food safety systems had an impact on the provision of safe food in hotels. It was therefore concluded that implementing food safety systems leads to the provision of safe food in hotel.

4.3 Recommendations

The study recommends that that application of standard food safety systems led to the provision of safe food in hotels. The study recommends that all hotels meet requirements to ensure the safety of foods. The proliferation of laws and regulations to food safety management system standards are the response to concerns of the hotel management. Developments in food safety regulation spark a move towards a more strict approach to food safety. A range of laws, acts, regulations, norms and directives addressing a variety of different aspects in food hygiene, should be enforced by relevant authorities. Responsible governments should adopt a fully-fledged food safety authority that would be responsible for coordinating food safety operations, awareness, and the regulation of food trade and processing.

5.0 REFERENCES

Abdul-Mutaib, N. A., Abdul-Rashid, M. F., Mustafa, S., Amin-Nordin, S., Hamat, R. A., & M., O. (2012). Knowledge, attitude and practices regarding Hygiene and sanitation of food handlers in Kuala Pilah, Malaysia. Food control, 289-293.

- Abera, B., & Kibret, M. (2012, 01 22). The sanitary conditions of food service establishments and food safety knowledge and practices of food handlers in Bahir Dar town. *Ethiopian. J Health Sci.*, pp. 27-35.
- Adebitan, E. O. A. (2016). Assessing Compliance with Food Hygiene Requirements among Urban and Sub-urban classified hotels In Bauchi State, Nigeria (Doctoral dissertation, Kenyatta University). <https://ir-library.ku.ac.ke>
- Adebitan, E., Khayiya, R., & Mugambi, R. (2014). Investigation of hotel food safety in Bauchi. *International Journal of Advance Studies, Economics and Public Sector Management*. Vol. 2 No. 1 3(8), 142–155. Admasu, M., & Kelbessa, W. (2018). Food Safety Knowledge, Handling Practice and Associated Factors among Food Handlers of Hotels/Restaurants in Asosa Town, North Western Ethiopia . *SM Journal of Public Health and Epidemiology* 4(2), 1051.
- Ajzen, I. (2011). The Theory of Planned Behaviour. *Psychology & Health*, 26, 1113- 1127.
- Akintaro, O. (2012). Food Handling, Hygiene and the Role of Food Regulatory Agencies in Promoting Good Health and Development in Nigeria. *Int. J. Health Med. Inform.* 1(3), 2150 -2350.
- Akonor, P. T., & Akonor, M. A. (2013). Food Safety Knowledge : The Case of Domestic Food Handlers in Accra. *European Journal of Nutrition & Food Safety*. 3 (3), 99–111.
- Binkley, M., & Henroid, D. (2012). Assessing Factors Contributing to Food Safety Culture in Retail Food Establishments. *Food Protection Trends*, Vol. 32, No. 8,, 468–476.
- Ngala, B. (2015, March 24). Strathmore University.edu/news/food-poisoning-incidentatstrathmores-4th-year-students-dinner/. Retrieved from [www.strathmore.edu:](http://www.strathmore.edu/news/) <http://www.strathmore.edu/news/>
- Manzano, I. A. (2013). Competency-Based Modules in Food Sanitation and Safety. *International Journal of Academic Research in Business and Social Sciences*, 3(8), 142-155.
- Marshall, C., & Rossman, G. B. (2010). Qualitative research design. Sage. McClusky, K. W. (2014). Implementing hazard analysis critical control points. *Journal of the Academy of Nutrition and Dietetics*, 104 (11), 1699-1700.
- Mwangi, P. N. (2018). Food Handlers’ Hygiene Practices as Determinants of Customers’ Choice of Selected African Indigenous Restaurants’ In Nairobi City County, Kenya (Doctoral issertation, Kenyatta University). <https://irlibrary.ku.ac.ke/handle/123456789/19269>
- National Research Council, (. (2010). Enhancing Food Safety: The Role of the Food and Drug Administration. Washington, DC: National Academies Press. Neal, J. A.,
- Nganga, R., Weru, J. M., Njoroge, J. N., & Weru, J. M. (2013). Safety management system : a case of fast food courts in nairobi central. *International Journal of Human Resource and Procurement*, vol.1(3), 1–13.