

**ROLE OF FOOD MANAGEMENT SYSTEMS ON FOOD SAFETY
IN 5-STAR RATED HOTELS IN NAIROBI CITY COUNTY,
KENYA**

BY

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DECLARATION

This thesis is my original work and has not been presented for a Degree in any other University.

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DEDICATION

I dedicate this work to my late parents, my wife, children and family for their endless support and assistance in the whole process of writing this work and building a strong foundation throughout my studies at Kenyatta University.

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I wish to take this opportunity to thank God for enabling me get this far - it has taken His mighty hand.

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ABBREVIATIONS AND ACCRONYMS

CAC	Codex Alimentarius Commission,
DPH	Department of Public Health
FAO	Food and Agriculture Organization
FBI	Food Borne Illnesses
FSA	Food Standards Agency
FSMS	Food Safety Management System
FSP	Food Safety Plan
FSSC	Food Safety System Certification
GMP	Good Manufacturing Practice
GHP	Good Hygienic Practices
HACCP	Hazard Analysis and Critical Control Points
ISO 22000	International Standard Organizations 22000
MICE	Meeting Events Conference & Exhibitions
QMS	Quality Management Systems
SSOP	Sanitation Standard Operating Procedures
USA	United States of America
WHO	World Health Organization

OPERATIONAL DEFINITION OF TERMS

The following operational definitions apply to this study.

Biological Hazards: Biological hazards come mainly from microorganisms including bacteria, viruses and parasites

Chemical Hazards: Contamination of food by chemicals

Contamination: The presence in the food of harmful chemicals and microorganisms which can cause consumer to be ill.

County: A geographical region in Kenya used for administrative or other purposes.

Disinfection: Destruction of micro-organisms to a level not hazardous to health or likely to cause food spoilage

Equipment: All the tools used in the storage, preparation, cooking and service of food in the hotels.

Food: A substance taken into the body to maintain life.

Food Handler: Any person employed in a food premise who at any time may be involved in the manufacturing, preparation or packing food for sale.

Food Hazards: Anything that can contaminate food and make it unsafe to eat

Food Holding: Maintaining food temperature at a particular level between when it was prepared to the time it is served.

- Food Hygiene:** All sanitary measures, principles and procedures put in place to ensure that food is free from agents of contamination or germs in any form in order to promote a healthy living.
- Food Premises:** Any places where food or ingredients are stored, handled, processed or served.
- Food Safety:** Refers to that part of an organization's quality management system that is explicitly aimed at monitoring and ensuring that food safety needs are met to prevent foodborne illnesses as a result of contamination.
- Hotel:** An establishment that provides paid lodging on a short-term basis, meals and various personal services for the public
- Management System:** A set of policies, processes and procedures used by an organization to ensure that it can fulfill the tasks required to achieve its objectives.
- HACCP:** A management tool utilized in food service establishments to check food safety by identifying physical, chemical and biological hazards in processing and production of food.
- Pathogens:** Micro-organism that has the capacity to cause disease i.e. has the property of pathogenicity.
- Personnel:** Refers to the store, kitchen and restaurant staff, involved in food handling.

- Physical Hazards:** Objects which are not a part of food, never was meant to be food but somehow got into the food accidentally. Examples are pieces of glass or metal, toothpicks, hair, staples, Jewelry.
- Premises:** These include the kitchen facility and its environment, the restaurant facility and its environment, and the store facility and its environment.
- Restaurant:** An establishment which prepares and serves food and drink to customers in exchange of money either paid before a meal or after a meal.
- Role:** A set of connected behaviors, obligations, and norms as conceptualized by people in a social situation.
- Sanitation:** Measures to protect public health through proper solid waste disposal, sewage disposal, and cleanliness during food processing and preparation.

ABSTRACT

Ailments spread through food remains a common and persistent problem resulting in considerable illness and occasional mortality. The hospitality industry faces a unique set of risk management challenges as it strives to provide services and amenities that guests demand for their travels. Food Safety is important for the wellbeing and safety of hotel guests. 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. The purpose of the study was 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.

CHAPTER ONE

INTRODUCTION

1.0 Background of the Study

Throughout the world, incidents of foodborne illnesses occur daily, from the least developed nations to the most developed. According to World Health Organization [WHO] (2015) incidences of foodborne disease globally is difficult to estimate, but it was reported that in 2005 alone 1.8 million people died from diarrhoeal diseases. A large share of these cases can be ascribed to contamination of food and drinking water. Additionally, the percentage reported suffering from foodborne diseases in industrialized countries, each year has been estimated to be up to 30%. In the United States of America (USA), it is estimated, around 76 million cases of foodborne diseases occur each year resulting in 325,000 hospitalizations and 5,000 deaths (WHO, 2015). The report further states, developing nations while less well documented, bear the brunt of the problem due to the presence of a wide range of foodborne diseases. The high prevalence of diarrhoeal diseases suggests major underlying food safety problems.

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).

(Abdul-Mutaib, 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 (Fontannaz-Aujoulat, 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.

Different bodies and legislation highlight basic procedures of handling food to certify that food provided is safe. WHO provided procedures of ensuring that food remain safe and include keeping food clean, separating raw and cooked, cooking to the correct temperature and keeping food at safe temperatures (Jainie, Nor, Sharif, & Saad, 2016). Moreover, the HACCP framework provides procedures of storing, handling, cooking and cleaning through the analysis and control of biological, chemical, and physical hazards from raw material production, procurement and handling, to manufacturing, distribution and consumption of the food (Tian, 2017). The responsibility in Kenya, for managing the multiple institutions (agencies) concerned in food safety management

rests with the Department of Public Health (DPH) under the Ministry of Public Health and Sanitation. Basic Kenyan food safety laws enforced by DPH include the Food, Drugs and Substances Act, Chapter 254, the Public Health Act, Chapter 242 and the Meat Control Act, Chapter 316. Despite the stipulations of food safety guidelines, provision of safe food remains a major problem both in developed and developing countries.

It is the responsibility of the organization to develop systems in order to ensure that all employees are able to carry out their tasks effectively by using safe food handling practices. Food safety management system (FSMS) provides an approach that is preventative and reduces food-borne illnesses through identification of the hazards. It illustrates ways and means that prevent foodborne illnesses. This comprises a number of routines that need to be adhered to avoid potential health hazards. FSMS are indispensable in each section of the food production operations, to ensure food quality that is safe for the consumer (Orris & Whitehead, 2000). The use of HACCP and other FSMS has enabled food establishments with food safety controls. Standards provide a systematic approach to processes and due diligence is an important aspect, as it ensures employees and demonstrates that management is meeting responsibilities in relation to food safety and is doing so effectively.

Food hygiene is synonymous with food safety, embracing the processing, preparation or handling of food. Hotels face a unique set of management challenges as they strive to provide services and amenities that guests demand for their travels. Food Safety is important for the wellbeing and safety of hotel guests. Hotel Management in Kenya, as

a part of the global hospitality industry has an obligation to harmonize its services and comply with internationally recognized standards. Hotels should have in place clear food safety systems indicating procedures of hygienic handling of food conforming to universally acceptable principles and standards.

1.1 Statement of the Problem

Observing high safety standards and handling procedures, food consumed in restaurants of 5 star 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 in Nairobi City County 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 the five-star hotels in Kenya, there is limited empirical evidence to this effect. Further, there exists limited data relating to the impact and influence of management systems in food safety.

1.2 Purpose of the Study

This study was conducted to evaluate the effect of food safety management system on actual practices in 5 star hotels in Nairobi County.

1.3 Objectives of the Study

1.3.1 General Objective

The general objective of the study is to evaluate the effect of food safety management system on food safety in 5 star hotels in Nairobi County.

1.3.2 Specific Objectives

1. To evaluate the application of standard food safety systems on food safety in the 5-star hotels in Nairobi County.
2. To determine the effect of compliance to food safety systems on food safety in the 5-star hotels in Nairobi County.

3. To establish the effect of implementation of food safety systems on food safety in the 5-star hotels in Nairobi County.

1.4 Research Hypotheses

The following research hypotheses guided the study;

H₀₁: Application of food safety standards has no significant relationship with food safety in 5-star hotels in Nairobi County.

H₀₂: Food handler's compliance with Food Safety systems has no significant effect on food safety in 5-star hotels in Nairobi County.

H₀₃: Implementation of food safety management systems has no significant impact on food handling practices among the food handlers in 5-star hotels in Nairobi County.

1.5 Significance of the Study

The results of the study are of concern to food safety regulators and policy makers. The results will be of significant to Department of Public Health (DPH) under the Ministry of Public Health and Sanitation and Kenya Bureau of Standards (KEBS) that are mandated in overseeing that safe food is served in Kenya. Department of Public Health should periodically evaluate state of food served by various hotel outlets in Kenya. The study will provide information to DPH, Ministry of Public Health and KEBS as a guide for adoption by hotels in Nairobi County, in particular 5 Star relating to food safety.

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 the five star 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 five star 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.

1.6 Scope of the study

This study focused on the effect of food safety management system on actual practices in 5 star hotels in Nairobi City County by employing both quantitative and qualitative approach. From a contextual point, the study focuses on five star hotels in Nairobi

County. The five star hotels are of interest to the study as they serve both local and international visitors who contribute immensely to the growth of tourism.

1.7 Limitation of the study

The limitation of this study was hesitation by respondents to express their views regarding safety of food served in the restaurants fearing for the hotels reputation and victimization from the management. Moreover, food safety is a sensitive topic and thus hoteliers were reluctant to share information about state of food safety served by their hotels. However, the limitation was mitigated by assuring respondents of confidentiality and that the data collected will be used for purpose of academic research only.

There was also the challenge of time constraint. This was also addressed by dropping the questionnaire and booking an appointment to collect it at a later date.

The study relied much on primary data which is prone to bias. However, the respondents were requested to be as truthful as possible.

1.8 Conceptual Framework

The research study was conducted following the conceptual framework in figure 1.1.

Independent Variables

FOOD MANAGEMENT SYSTEM

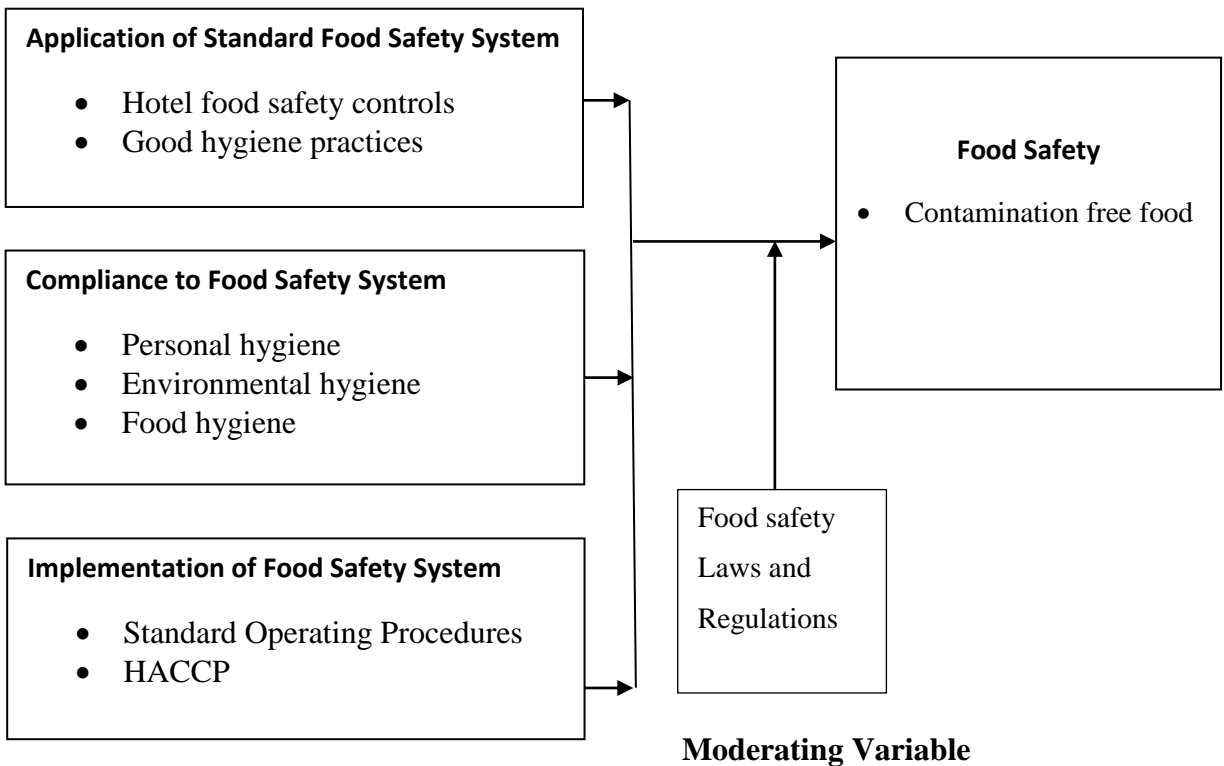


Figure 1.1: Conceptual Framework on role of Management Systems on Food Safety

Source: Source: (Jenie, Nor, & Sharif, 2015) and HACCP Framework (1960)

The conceptual framework presents the dependent variable which is food safety while independent variables presents the food management system that include application of standard food safety systems, compliance to food safety system and implementation of food safety system.

Application of standard food safety system in the study includes hotel food safety controls and good hygiene practices. Compliance to food safety system includes personal hygiene, environmental hygiene and food hygiene, while, implementation of food safety system for the study includes standard procedures and HACCP.

Food laws and regulations is the moderating variable and affects hotel food safety, through compliance with food safety standards, management operation policy and the food handler's awareness, knowledge and practice of food safety. When proper food management systems are upheld as shown in figure 1.1, it is expected that there will be enhanced food safety served by five star rated hotels.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter reviews literature on food management systems and food safety. The literature also includes the empirical review on application of standard food safety systems, compliance to food safety system and implementation of food safety system. The chapter further reviews the theories that guided the study which are the, Theory of Planned Behavior and Hazard Analysis and Critical Control Point Framework. Lastly, the study highlights the existing gaps based on the empirical literature.

2.2 Food management systems

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.

2.3 Food safety

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.

(Chipabika, 2014) conducted a study on an assessment of food hygiene practices among food handlers in restaurants in Kabwe Urban District. The general objective of the study was to assess food hygiene practices among food handlers in restaurants in Kabwe urban district. Specifically the study was conducted to establish characteristics of food handlers working selected restaurants, to assess the level of knowledge regarding food hygiene practices among food handlers and to assess food hygiene practices among food handlers in restaurants in Kabwe district. The results revealed that provision of safe food require adherence to recommended food management practices, food hygiene training including though washing of food utensils and washing hands before touching food. The study revealed that there was an association between education and level of knowledge in food hygiene. However, the study did not show the effect of level of knowledge in food hygiene on safe food provision.

2.4 Empirical Review

2.4.1 Application of standard food safety systems

Hotel service providers have a mandate to ensure customers are served with safe food free of contamination. To do so, food safety control system needs to be in place that keeps pace with the present environment in the food safety arena while addressing new challenges that impact on consumers (Damalie, 2015). The successful application of these principles requires hotels to have the essential foundations of a food safety system

in place. Certain guiding principles govern modern food safety systems and directly impact on their effectiveness (Humphrey, 2017). The successful application of these principles requires countries to have the essential foundations of a food safety system in place. The elements of a national food safety control system include Food policy, law and regulations, food control management and inspection services.

The development of relevant and enforceable food policy, legislation and regulations is an essential component of an effective food control system. Relevant and enforceable laws are required to create an enabling and predictable environment in which to develop and enforce food safety measures (Liu, Han, Zhang, Li, Wang & Zheng, 2016). The capacity of stakeholders involved in different aspects of food safety is dependent, in part, on the effectiveness of this national legal framework. Modern food law should contain the necessary statutory powers to ensure jurisdiction over food safety from farm to table and allow competent food authorities to take immediate preventive and enforcement measures (Nychas, Panagou, & Mohareb, 2016). In addition to food laws and regulations, governments need updated food standards. They should take full advantage of existing Codex standards. They must tailor available information, concepts and requirements to the national context, so as to develop a regulatory framework that will both satisfy national needs and meet international obligations and trading partners' demands.

Food control management, as an effective food control systems require operational coordination at the national level including an institutional structure which responds to the needs of food safety management (Wang, Weller, Falardeau, Strawn, Mardones,

Adell & Switt, 2016). Where food control responsibilities lie among different government agencies, the roles and responsibilities of these agencies should be clearly defined and efforts made to establish a more integrated system, in order to provide increased consistency in assuring the safety of food.

As indicated, legislation and complementary regulations are some of the fundamental components of a food control system. The best food safety regulations are worthless in the absence of proper enforcement. Consequently, because it is central to the enforcement process, inspection plays a critical role in food safety and quality control (Mwamakamba, et al., 2012). An efficient food safety management system necessitates clear inspection policy and procedures that are employed by inspectors who are well trained not only to apply these procedures but also to act as quality assurance advisors and extension officers to the food industry.

(National Research Council, 2010), undertook a study in enhancing food safety: The role of the food and drug administration. A 13-member committee with vast experience in Food and Drug Administration, risk analysis and communication, food law and regulations, food policies and programs, epidemiology, monitoring and surveillance, food microbiology and toxicology, economics, feed issues, and state food programs was convened to conduct this study. The committee gathered information through six meetings, statements in response to specific queries to the Food and Drug Administration, and public documents. Although there have been prior efforts to identify needed improvements in food safety, recent multistate foodborne illness outbreaks have again highlighted a food safety system that is not always effective in

protecting the public health. The Food and Drug Administration has been criticized as responding only reactively to food safety problems and neglecting its preventive functions presenting conceptual gap.

(Mwamakamba, et al., 2012), conducted a study; developing and maintaining national food safety control systems: Experiences from the WHO African region. This paper reviews the components of a modern national food safety control system and examines efforts at strengthening national food safety control systems in the African Region. It includes experiences from countries that have made efforts at strengthening their national food safety control systems in view of current developments. Effective national food safety control systems are essential to protect the health and safety of consumers by assuring the safety of imports and exports as well as foods produced for local consumption. However, the study did only identify national food safety control systems without illustrated how the food safety systems should be implemented presenting conceptual gap.

(Casolani, Liberatore, & Psomas, 2018), conducted a study on implementation of Quality Management System with ISO 22000 in Italian Food Companies. ISO 22000 certification demonstrates the ability of an organization to implement a Food Safety Management Systems (FSMS). The research was carried out using a sample of 180 Italian food Companies interviewed. The sample considered in the present study is constituted by Companies in the Italian food industry certified for at least 2 years. The respondents were all qualified as Quality Control / Assurance Manager. Data were elaborated through SPSS 22.0 Statistical Software Package. The main benefits derived

from the application of this standard are both external and internal: ISO 22000 improves commercial opportunities and internal procedure; the main obstacles to implementation are perceived particularly by Micro-Small Companies at the beginning phase of certification and they are related to changes in internal organization and the costs involved in certification. However, the study focused on Italian food companies unlike current study that focuses on food safety in five star rated hotels presenting contextual gap.

2.4.2 Compliance to food safety system

(Makwanda & Woyo, 2014), conducted a study on food safety violations by food handlers in the food industry in Zimbabwe. Questionnaires were dispensed to food handlers at four city hotels in Zimbabwe. The outcomes indicated that a number of food handlers in Zimbabwe are not cognizant of food safety violations and it was observed that there was a general lack of trust in food safety legislation and enforcement agencies. In addition it was indicated that there was a general deficiency of knowledge and understanding and a lack of motivation by the Standards Association of Zimbabwe and the Health Council of Zimbabwe in handling food safety violations. However, food legislation guidelines might be different from those in Kenya hence the need to conduct the study.

(Adebitan, 2016) conducted a study to assessing compliance with food hygiene requirements among urban and sub-urban classified hotels in Bauchi State, Nigeria. The diagnostic survey design was adopted and a census population was used for a reliable result. The study findings were that all the hotel operators in Bauchi are not aware of

the National Environmental Health Practice Regulations on food hygiene and sanitation guiding their food business operations, that the level of compliance with hygiene and sanitation regulations, and that there was no relationship between enforcement and compliance with sanitation standards. However, the study focused on restaurants in Nigeria whose operating environment and food legislation guidelines might be different from those in Kenya hence the need to conduct the study. Further, the study did not highlight the state of food safety in the hotels.

(Shi, 2017), conducted a study on study on food quality and safety management based on hotel management. Through the practical use of the HACCP management system in the catering industry, it was discovered that the quantity of bacteria significantly reduced and the pass rate of tableware disinfection increased significantly in the hotel's food processing, while patron satisfaction exceedingly improved. Therefore, the HACCP management system had immense applicability in tweaking the food quality and safety of hotels.

(Souza, Azevedo, & Seabra, 2018), conducted a study on food safety in Brazilian popular public restaurants: Food handlers' knowledge and practices. Questionnaires were administered to 70 food handlers in different municipalities, with inquiries linked to food safety knowledge and self-reported practices and observed practices. The observed food safety policies tendered no correlation with food safety knowledge and self-reported practices. However, the study focused on restaurants in Brazil whose operating environment and food legislation guidelines might be different from those in Kenya hence the need to conduct the study.

2.4.3 Implementation of food safety system

(Julien & Mensah, 2011), conducted a study on implementation of food safety management systems in the UK. The paper first explores developments in international food safety regulation in general and in particular, the UK. Using a survey and case study methodology, the paper examines the response of food manufacturing enterprises to food safety regulation, and uses statistical techniques to investigate the effects of enterprise size on the drivers for, benefits of, and challenges to compliance. Further, the factors that influence the successful application of an integrated food safety management system are also examined. The results show a great deal of both statutory and private regulation that has incentivized enterprises. In response, enterprises have implemented integrated food safety management systems to proactively deal with the risks associated with food safety, however, enterprises claim that statutory regulations are biased towards consumers, without adequate impact assessments on all stakeholders within the chain, and hence causing industry to incur significant costs that could otherwise be avoided. The study focused on food manufacturing firms in UK, unlike current study that focuses on implementation of food safety system among five star hotels presenting both conceptual and contextual gap.

(Damalie, 2015) conducted a study assessing the impact of food safety requirements on the performance of Canadian Agri-Food Exporters. Drawing from the resource-based theory of the firm, the first model focuses on the determinants of food safety challenges, and the second model measures the impact of food safety challenges on the export performance of firms using two indicators; sales growth and number of export

markets. The results show that food safety challenges matter and they are one of the key drivers of export performance for Canadian Agri-food exporting firms; though the impact of food safety challenges on export sales growth is bigger than the number of export markets. The OLS regression results show that food safety challenges are influenced by prior investments in the internal food safety resources as well as the implemented food safety systems within the firm. However, the study focused on food safety requirements and performance of Canadian Agri-Food Exporters unlike current study that wishes determine food safety in five star hotels by implementing food safety system.

(Sjafrina & Yani, 2013), conducted a study on food safety and the implementation of quality system in food. Implementation of Good Handling Practice (GHP) and Good Manufacturing Practice (GMP) and Hazard Analysis Critical Control Point (HACCP) are a responsibility and awareness of manufacturers and distributors. Some of the food safety regulations have been issued by the government of Indonesia such as Law. 18 on Food in 2012 to provide protection to consumers and food producers will be healthy, safe and lawful. Development of quality systems of food safety and implementation quality system in the food industry are a shared responsibility between governments, producers and distributors of raw materials, food industry, and consumers. Some effort implemented by the government involved foodstuff storage, ensuring food nutrition includes sanitation. The implementation of national security and quality system aimed to identify the strength, weakness, opportunities and risk of food production. However,

the study focused on food safety in general unlike the current study that focuses on food safety among star rated hotels.

2.5 Theoretical Review

2.5.1 Hazard Analysis and Critical Control Point Framework.

Hazard Analysis and Critical Control Point (HACCP) is a management tool utilized in many food service establishments to check food safety worldwide (McClusky, 2014). The HACCP system helps operators of food businesses examine how food is handled and introduces procedures to ensure food produced is safe to eat. HACCP-based food safety programs have been accepted and implemented as an effective means of managing food safety risks (Soman & Raman, 2016). Hazard analysis is key to any food safety management system, since conducting a hazard analysis assists in organizing the knowledge required to establish an effective combination of control measures. According to (Anandappa, 2013), food safety systems based on HACCP have been widely acclaimed as an effective means for producing safe food. The HACCP System identifies specific hazards and measures for their control to ensure the safety of food.

The HACCP system helps operators of food businesses examine how food is handled and introduces procedures to ensure food produced is safe to eat. HACCP is an important tool in combating the worldwide escalation of food-borne illness and has been in use since the 1960s. According to Principles of Food Hygiene, the HACCP System is a science based systematic approach that identifies specific hazards and measures for their control to ensure the safety of food. It is recommended by the

United Nations international standards organization, the Codex Alimentarius Commission for food safety. The HACCP System is based on seven principles:

Principle 1: Conduct a hazard analysis.

Principle 2: Determine the Critical Control Points (CCPs).

Principle 3: Establish critical limit(s).

Principle 4: Establish a system to monitor control of the CCP.

Principle 5: Establish the corrective action to be taken when monitoring indicates that a particular CCP is not under control.

Principle 6: Establish procedures for verification to confirm that the HACCP system is working effectively.

Principle 7: Establish documentation concerning all procedures and records appropriate to these principles and their application.

According to (Chege, 2017), apart from safety of food other factors contributing to benefits of HACCP uptake include improved product quality, increased employee skills, improved company image, increased product sales, increased market share, and access to new markets.

2.5.2 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 behaviour 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.

2.6 Summary of Literature Review and Gaps Identified

The chapter discussed the conceptualization of food management systems and safe food provision. Empirical review was conducted on each objective where past studies were

reviewed. Based on these reviews, critique was undertaken to reveal conceptual and contextual gaps. A study by (Mwamakamba, et al., 2012) only identified national food safety control systems without illustrating how the food safety systems should be implemented presenting conceptual gap. A study by (Casolani, Liberatore, & Psomas, 2018) focused on Italian food companies unlike current study that focuses on food safety in five star rated hotels presenting contextual gap. Moreover, a study by (National Research Council, 2010) has been criticized as responding only reactively to food safety problems and neglecting its preventive functions presenting conceptual gap.

(Makwanda & Woyo, 2014), conducted a study on food safety violations by food handlers in the food industry in Zimbabwe. However, food legislation guidelines might be different from those in Kenya hence the need to conduct the study. A study by (Adebitan 2016) focused on restaurants in Nigeria whose operating environment and food legislation guidelines might be different from those in Kenya hence the need to conduct the study. Further, the study did not highlight the state of food safety in the hotels. A study by (Julien & Mensah, 2011), focused on food manufacturing firms in UK, unlike current study that focuses on implementation of food safety system among five star hotels presenting both conceptual and contextual gap.

A study by (Damalie 2015), focused on food safety requirements and performance of Canadian Agri-Food Exporters unlike current study that wishes to determine food safety in five star hotels by implementing food safety system. A study by (Wangi 2018), on food handlers' hygiene practices as determinants of customers' choice of

selected African indigenous restaurants' in Nairobi County, Kenya did not link handlers' hygiene practices and provision of safe food hence the need to conduct the study. A study by (Souza, Azevedo, & Seabra, 2018) on food safety in Brazilian popular public restaurants: Food handlers' knowledge and practices focused on restaurants in Brazil whose operating environment and food legislation guidelines might be different from those in Kenya hence the need to conduct the study. The theories that guided the study included Theory of Planned Behavior and HACCP Framework. The relevancy of the theories was also discussed in this section.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter has given a detailed outline of the research design that was adopted so as to meet the objective of the study. It addresses the target population, sample design, data collection procedures and instruments that were used and how the data was analyzed.

3.1 Research Design

The study applied descriptive cross sectional survey design. Cross sectional survey was appropriate when analyzing data from a population at a specific point in time. The design is relevant in determining cause and effect among variables hence it was suitable in evaluating the effect of food safety management system on actual practices in 5 star hotels in Nairobi County.

3.2 Study Area

The study was carried out in Nairobi City County, Kenya. Nairobi City County has a population of 4.39 million people (KNBS, 2019). Due to the population in the city and being a destination for conferences and events, the selected 5 star rated hotels are face competition from other hotels in the industry.

3.3 Target Population

The study population was 10 five star hotels in Nairobi County. The units of observation were 30 food & beverage manager, 20 chef, 172 cooks, 72 kitchen

stewards, 173 waiters and 30 store clerks. Thus the target population was 496 hotel workers (food & beverage manager, chef, restaurant managers, cooks, cleaners, waiters and store clerks) at the five star hotels. The respondents were appropriate as they were largely involved in food handling and management.

Table 3.1: Target population

Respondents	Htl 1	Htl 2	Htl 3	Htl 4	Htl 5	Htl 6	Htl 7	Htl 8	Htl 9	Htl 10	Total
F & B Manager	3	3	3	3	3	3	3	3	3	3	30
Chef	2	2	2	2	2	2	2	2	2	2	20
Cooks	19	20	16	18	15	17	15	19	15	18	172
Kitchen Cleaners	8	7	8	7	6	7	9	6	5	9	72
Waiters	18	20	19	17	15	16	19	18	14	17	173
Store clerks	3	3	3	3	2	3	3	3	3	3	29
Total	53	55	51	50	43	48	51	51	42	52	496

3.4 Sample size and Sampling Technique

Yamane (1967) formula was used to obtain their sample size of 221 respondents.

$$n = \frac{N}{1 + N(e)^2}$$

Where; n= sample size, N=Population, e = level of precision

$$n = 496 / (1 + 496 (0.05)^2) = 21 \text{ sample size}$$

Table 3.2: Sample size

Respondents	Htl 1	Htl 2	Htl 3	Htl 4	Htl 5	Htl 6	Htl 7	Htl 8	Htl 9	Sample size
F & B Manager	1	1	1	1	1	1	1	1	1	9
Chef	2	2	2	2	2	2	2	2	2	18
Cooks	7	7	6	6	5	6	6	6	6	55
Kitchen Cleaners	4	4	5	4	4	4	4	4	4	37
Waiters	10	9	9	9	9	9	10	9	10	84
Store clerks	2	2	2	2	2	2	2	2	2	18
Total	26	25	25	24	23	24	25	24	25	221

3.4.1 Sampling Technique

Purposive sampling was used to for 9 food & beverage managers and 18 chefs, while stratified random sampling was used to select 55 cooks, 37 kitchen stewards, 84 waiters and 18 store clerks. The intention was to ensure inclusivity of all the food handlers in the population. At the first level of sampling, respondents from the hotels consisted of the administrative heads of the units and included the Food & Beverage manager and chef who are responsible for maintenance and compliance of food safety standards in their different sections. The second level of sampling was carried out in respect to implementers, the cooks, kitchen stewards, waiter as the food handlers, together with the storekeepers to obtain the respondents.

3.5 Research Instruments

Data was collected using questionnaires, in-depth interview guide and observation checklist.

3.5.1 Questionnaire

The study employed questionnaire to collect data. (Marshall & Rossman, 2010), point out that, questionnaires are suitable for studies since information they collect is not directly observable as they inquire about feelings, motivations, attitudes, accomplishments as well as experiences of individuals. A comprehensive questionnaire with well-structured questions was administered to the cooks, kitchen cleaners, waiters and store clerks of the sampled hotels. The questions were a mixture of both open and closed-ended questions. The questionnaire was divided into sections that included, demographics, management systems, adoption of standards, and impact of safety system and food safety. This study employed the use Likert scale for some questions. Respondents were given freedom to respond using their own words with the open-ended questions. A semi-structured interview schedule was used for the managers.

3.5.2 Interview Guide

Interview guide (Appendix 5) was also developed as per the objectives guiding the study and administered to restaurant managers. The responses were recorded and subsequently transcribed and reported in accordance to the themes sought. The use of in-depth interview technique allowed in-depth understanding of the operations under study by facilitating one on one conversation with the restaurant managers. It allowed triangulation of findings by complementing quantitative data collected via questionnaire.

3.5.3 Observation Checklist

Observation checklist was also used to observe the following; food premises, equipment, kitchen areas, food waste, water supply, food stuff, personal hygiene, training and temperature control (Appendix 4). Observation is used as it has an advantage of studying an institution's facility or process in its natural setting thereby providing a richer understanding of the subject (Veal, 2017).

3.6 Pre testing

3.6.1 Reliability Test

Preliminary analysis using the pretest technique was undertaken to ensure that the data collection tool is reliable. The researcher conducted a pre-test in one of the 5-star rated hotels. According to (Singh & Masuku, 2014) the size of a sample to be used for pretesting should be between 5- 10% of the sample. Pretest was conducted on 10% level thus 23 hotel workers selected from (food & beverage manager, chef, restaurant managers, cooks, cleaners, waiters and store clerks) participated in the pretest study. The recommended estimation of 0.7 was used as a cut-off of the reliability of the instrument. The respondents were not included in the final study. Table 3.3 shows that all the variables had a Cronbach alpha above 0.7 and thus were accepted.

Table 3.3: Reliability Results

Variable	Respondents	α=Alpha	Comment
Application of standard Food safety systems	23	0.814	Reliable
Compliance to food safety system	23	0.753	Reliable
Implementation of food safety system	23	0.785	Reliable

Tables 3.3 indicate the statistical reliability for the various variables. A pre-test study is undertaken on 10 percent of the sample population (Creswell & Creswell, 2017). All the variables were quite reliable with a Cronbach's alpha reliability coefficient greater than 0.7. Application of standard Food safety systems had the highest reliability ($\alpha=0.814$) followed by Implementation of food safety system ($\alpha=0.785$) while Compliance to food safety system had Cronbach alpha ($\alpha=0.753$). The study thus found that the instrument used was reliable and could be used for further analysis.

3.6.2 Validity Test

To ensure content validity, the questionnaire was subjected to thorough examination by hotel experts. The hotel general managers evaluated the statements in the questionnaire for relevance and whether they are meaningful, clear and objective before embarking on actual data collection. Their review comments were used to ensure that content validity is enhanced.

3.7 Data Collection Techniques

The study employed semi-structured questionnaires, interview guide and observation checklist. The semi-structured questionnaires were self-administered to food &

beverage manager, chef, restaurant managers, cooks, kitchen stewards, waiters and store clerks. The restaurant managers were engaged in interview sessions. The responses from the restaurant managers were recorded and subsequently transcribed and reported in accordance to the themes sought. Observation checklist (Appendix 4) containing items of assessment of hygiene and sanitation were used to collect information on the state of affairs and sanitary working conditions of the hotels.

3.8 Data Analysis and Presentation

The data gathered were quantitative and qualitative. Research findings were presented in narrative and descriptive form, figures, graphs and bar charts. Descriptive statistic such as averages, variances, frequencies, standard deviations and percentages was used to analyze the data. Inferential statistics such as *t-test* and ANOVA was used to measure between and within dependent and independent variables. Multiple regression analysis and Chi-square test was used to establish relationships. All inferences and conclusions of the study were made at 95% confidence level. Rejection criteria therefore involved rejecting the null hypothesis whenever the p-value was less than the significance level of the test ($p\text{-value} < 0.05$).

Table 3.2: Summary of Analysis Techniques

Research Objective	Analysis	Evaluation
To evaluate the application of standard food safety systems on food safety in the 5-star hotels in Nairobi County	Descriptive analysis, paired t-test, chi square, correlation analysis, multiple regression models and Content analysis technique	Relationship that exist between application of standard food safety systems and food safety
To determine the effect of compliance to food safety system on food safety in the 5-star hotels in Nairobi County		Relationship that exist between compliance to food safety system and food safety
To establish the effect of implementation of food safety system on food safety in the 5-star hotels in Nairobi County		Relationship that exist between implementation of food safety system and food safety

3.8.1 Hypothesis Testing

Hypothesis testing was done using p value. The acceptance or rejection criterion was that, if the p value is greater than the significance level of 0.05, the study fails to reject the H_0 . But if the level of significance is less than 0.05, the study fails to accept the H_0 (Sekaran & Bougie, 2016).

3.9 Ethical Consideration

The researcher obtained an approval from the Kenyatta University Graduate School in order to conduct the study; permission was obtained from the National Commission of Science Technology and Innovation (NACOSTI). A letter to each of the Hotel Managers was written requesting for permission to carry the study in their units. Self-

administered questionnaires were distributed and collected at appropriate time to increase the return rate. The respondents were requested for their voluntary participation and consent sought prior to their participation. All the respondents were assured of their anonymity and the data collected from the respondents kept confidential.

CHAPTER FOUR

FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter provides the findings and discussions. The findings are presented in line with the study objectives. Analysis of descriptive statistics and inferential statistics were conducted and the results presented in form of tables and figures. Interpretation of the results was also done in this chapter.

4.2 Response rate

The response rate measured how well the targeted sample size was achieved and was expressed as a ratio in percentage form of the actual number of respondents in the study. Since response rate was related to sampling fraction, which is the ratio of the sample size to the population size, the higher the response rate, the higher the sampling fraction and consequently, a good sample representation. High response rates minimized obtaining biased statistics and consequently, made study findings valid and reliable. The number of questionnaires distributed was 221. A total of 185 questionnaires were returned. The return rate is shown in Table 4.1.

Table 4.1: Response Rate

Item	Frequency	Percent
Returned	185	83.7
Unreturned	36	16.3
Total	221	100%

Results in Table 4.1 indicates return rate of 83.7%. A response rate of above 50% is adequate for a descriptive study. Further, (Babbie, 2010) confirms that response rates of above 50% are acceptable for analysis, 60% is good, 70% is very good while above 80% is excellent. Hence, a response rate of 83.7% is very good for the study (Davison & McCarthy, 2016).

4.3 Demographic Data

For the study to determine impact of best practices, integrated in Hotel management system, on food handlers and safety of food in 5-star Hotels in Nairobi County, it was considered important to establish background information of the respondents which included levels education, period of service, department and position held by the respondents. This was inspired by the need to establish whether there exists any close relationship among respondents' demographic characteristics and implementation of safe food management systems. Food safety is often affected by people's ways of life and other individual factors.

4.3.1 Education Level

The study considered level of education of the food handlers as an important factor in determining the level of food safety. Figure 4.1 shows the level of education of hotel staff.

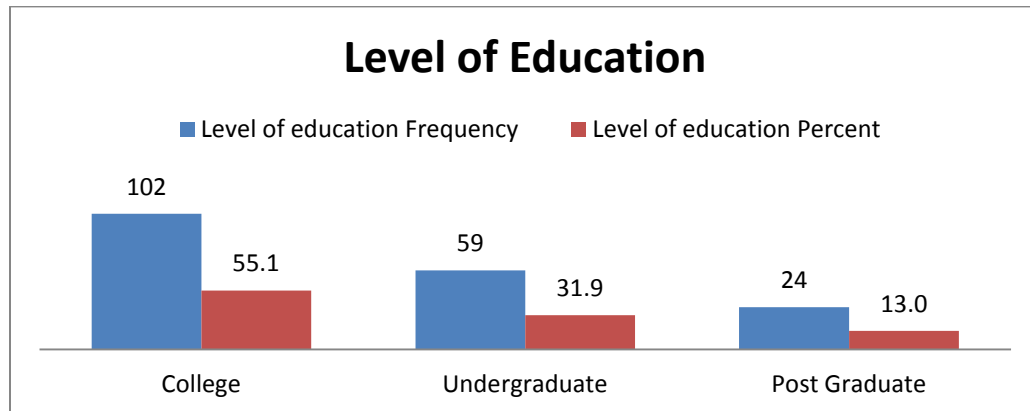


Figure 4.1: Distribution by Level of Education

The findings in Figure 4.1 indicated that, majority 55.1% of the respondents had college level of education, 31.9% had undergraduate level of education while 13.0% had post graduate level of education. Understanding particular explanation on food safety requires proper education, learning and in-depth inquiry. Handlers' awareness of their critical role and responsibility in food safety, as well as their knowledge and skills, are of crucial importance for handling food safely. The food industry demands of educated people equipped in food hygiene training through to technological know-how and awareness, to meet the increasing demand for safer of food served to consumers. (Al-Shabib, Mosilhey, & Husain, 2016), advised that personnel who handled food must be knowledgeable and adhere to sanitation guide lines and practices. (Nik Husain, Wan Muda, Noor Jamil, Nik Hanafi, & Abdul Rahman, 2016), also echoed the same sentiments that there was need for formal education and trainings targeted to the required level of knowledge. (Kunadu, Oforu, Aboagye, & Tano-Debrah, 2016), also noted that level of education significantly affects food handlers' awareness of foodborne diseases.

4.3.2 Work Experience

The study considered work experience as an important factor in determining the level of performance and in particular, its impact on the level of operation on food safety, knowledge and skills.

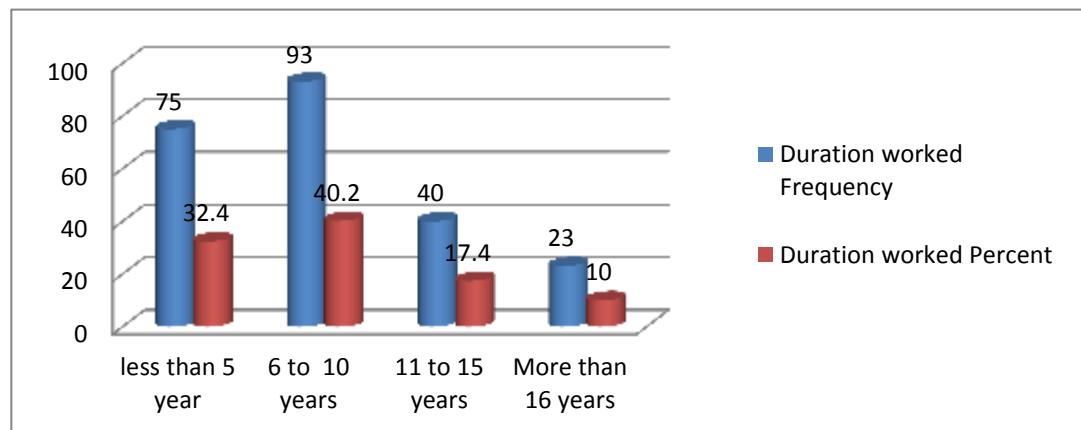


Figure 4.2: Distribution by Duration Worked

The findings in Figure 4.2 indicated results that showed 40.2% of the respondents had worked for a period of between 6 to 10 years, 32.4% of the respondents indicated a period of less than 5 year, 17.4% had worked for a period of 11-15 years while only 10% of the respondents had worked for a period of more than 16 years. Duration worked is statistically significant with food safety practices indicating a significant association between work experience and food safety. Sufficient experiences and expertise in a range of food production and food safety disciplines is essential in identifying sources of food safety risk and in developing measures to prevent the risks at the most appropriate stages of the chain. Staff needs to have vast experience on proper food handling process to minimize food contamination.

4.3.3 Gender

Demographic results in Figure 4.3 further indicated that majority 57.8% of the respondents were in males while 42.2% of the respondents were in females. The results imply that majority of employees in five star hotels are males.

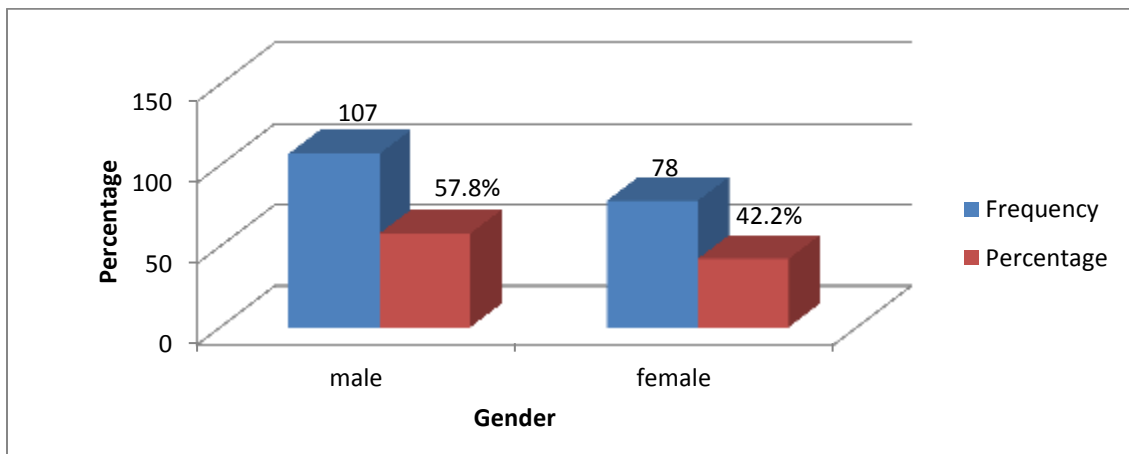


Figure 4.3: Distribution by Gender

From the results, it seems more females are interested in pursuing hotel and hospitality courses. On gender representation in Kenya's hospitality industry, (Koome & Kiprutto, 2013) established that majority of employees (64%) working in the hotels are males compared to (36%) of the employees who are females. Further, in Turkey (Pinar, McCuddy, Birkan, & Kozak, 2011) in study on gender diversity in the hospitality industry shows that about two-thirds of the respondents are men and approximately one-third of them are women suggesting that the Turkish hospitality industry is relatively male-dominated, which in turn could point to a gender effect that favors men.

4.3.4 Age

Age has a relationship with career commitment. Figure 4.4 shows age distribution of hotel staff.

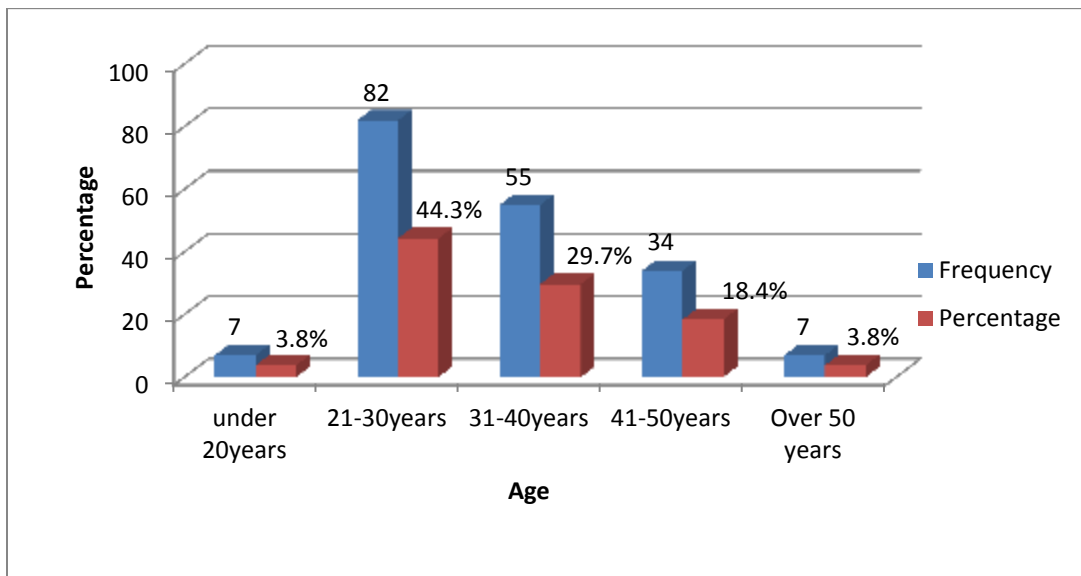


Figure 4.4: Distribution by Age

It was also established 3.8% were aged 20 years and below, 44.3% were aged 21-30 years, 29.7% were aged 31-40 years, 18.4% aged 41-50 years, 3.8% were over 50 years in age. Most employees of the five star hotels are middle aged. Hotel industries tend to employ staffs who are young since it is perceived that young people are still energetic to drive growth of the hotel.

4.3.5 Training in Food Safety Management

The study considered level of education of the food handlers as an important factor in determining the level of food safety. The level of formal education is relatively high

among the staff in the hotels. Figure 4.5 shows training in food safety management in the five star hotels in Nairobi County.

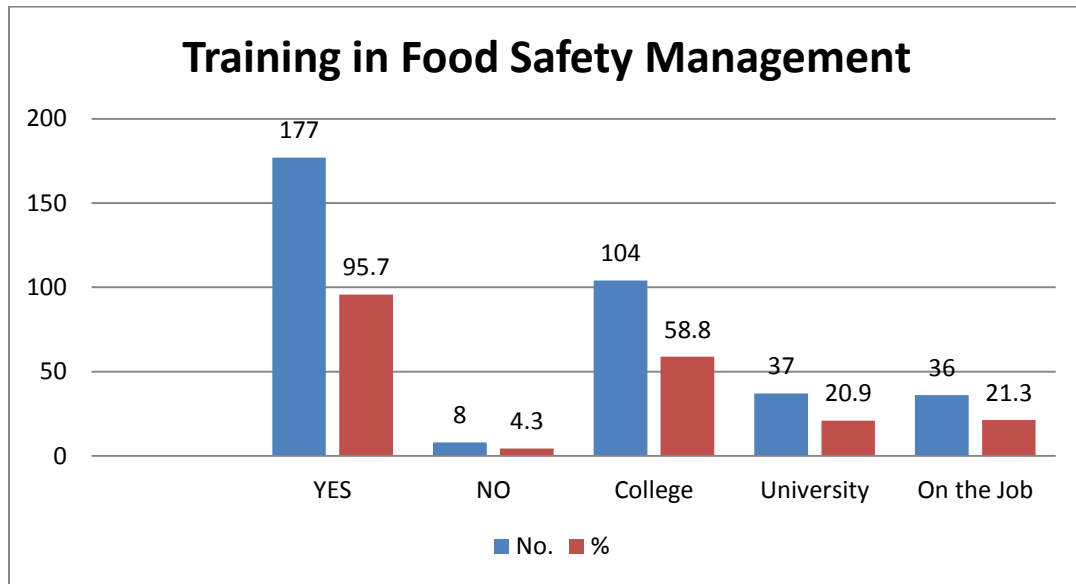


Figure 4.5: Distribution by Training

The findings in Figure 4.5 indicated that 95.7% had received training while 4.3% had not, with majority 58.8% receiving training from College, 20.9% from University and 21.3% on the Job. Properly trained hotel staff are able to adapt and implement food management system. Effective and relevant food hygiene training have a greater effect on intention and actual behaviour of the food handler, increasing the likelihood that safe working practices are carried out at all times. Such approaches are necessary if hygiene training is to have an impact on food safety management. The results are in line with (Rowell, Binkley, Thompson, Burris, & Alvarado, 2013) that providing employees with food safety training improved their employees' knowledge of food safety practices.

4.4 Objective 1: Application of Food Safety system

The first objective was to evaluate the application of standard food safety systems in the 5-star hotels. The objective was analysed by employing descriptive statistics and inferential analysis. Hypothesis testing was also conducted in this section.

4.4.1 Descriptive statistics

The study evaluated the application of standard food safety systems in the 5-star hotels. The participants of the study responded to statements related to application of standard food safety system. Result findings are presented in Table 4.2.

Table 4.2: Application of Food Safety system

Food Safety address	Yes	No	Don't know	Mean	Std. Dev
Hotel has food safety control aspects	88.1%	8.6%	3.2%	1.2	0.4
Food from only approved suppliers	79.5%	12.4%	8.1%	1.3	0.6
HACCP procedures in the production process	80.5%	13.0%	6.5%	1.3	0.6
Safe Storage conditions of all food	89.2%	10.8%	0.0%	1.1	0.3
Protection from contamination	85.4%	14.6%	0.0%	1.1	0.4
Average				1.2	0.5

Table 4.2 showed that majority 88.1% agreed that Hotel food safety control aspects are observed. The results also showed that majority of the respondents 79.5% indicated that the hotel receives food only from approved suppliers. According to the respondents, quality control is frequently observed while receiving food items, where the quality in

terms of freshness, weight, packaging and quantity is checked as per specifications given on the purchase order.

Further, 80.5% of the respondents agreed that the hotel follows HACCP procedures at every step in the production process. Effectiveness of HACCP depends on the skills and knowledge of staff and management. Before implementation, pre-requisite programmes such as documented standard operating procedure, good hygienic practices, staff training ought to be appropriately instituted.

Further, 89.2% of the respondents agreed that the hotel observes safe storage conditions of all food. Food must be stored in clean places with right temperatures to minimize food spoilage and contamination. Further, 85.4% of the respondents agreed that the hotel observes protection from contamination by storing away from chemicals, physical and biological contaminants. The average response was 1.2, an indication that majority of the respondents were in agreement that the hotel does have in place a food safety system. The standard deviation was 0.5, an indication that responses were clustered around the average mean response.

Hotel service providers have a mandate to ensure customers are served with safe food. The results imply that 5 star hotels in Nairobi City County have in place food safety control in their operation, as it is essential to ensure that services, particularly safe food is delivered to customers. (Humphrey, 2017) notes, certain guiding principles govern food safety and directly impact on their effectiveness. The successful application of these principles requires essential foundations of a food safety system to create an

enabling and predictable environment in which to develop an enforce food safety measures (Liu, et al., 2016).

4.4.2 Paired t-test

Paired t-test between the application of food safety systems and food safety was computed to see if there is any statistically significant change in food safety. The Paired t-test is presented in Table 4.3.

Table 4.3: Paired t-test

	Mean	Paired Differences			t	df	Sig.
		Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower Upper			
Pair 1 Food Safety systems	.34703	1.23623	.09089	.52635 .16771	3.818	184	.000
Food safety							

The p value is $0.000 < 0.05$ and therefore the study concludes that there is statistically significant change in food safety as a result of applying food safety systems. Application of food safety systems enhances provision of safe food. The results are in agreement with (Wandolo, 2016) that HACCP prerequisites are critical in ensuring food safety.

4.4.3 Cross tabulation between application of Food Safety systems and food safety

A cross tabulation table was presented to illustrate food safety for those hotels that observe application of food safety system and those that do not. The cross tabulation results are presented in Table 4.4.

Table 4.4: Cross tabulation between application of Food Safety systems and food safety

		Food safety		χ	p-value	comment
		Safe	not safe			
Hotel food safety control aspects	yes	91	42	25.505	0.000	significant
	no	11	30			
	Don't know	7	4			
Food from only approved suppliers	yes	93	39	27.145	0.000	significant
	no	10	30			
	Don't know	6	7			
HACCP procedures in the production process	yes	100	43	33.913	0.000	significant
	no	6	30			
	Don't know	3	3			
Storage conditions of all food	yes	101	44	31.937	0.000	significant
	no	8	32			
	Don't know	-	-			
Protection from contamination	yes	100	44	29.74	0.000	significant
	no	9	32			
	Don't know	-	-			

The results showed that hotel food safety control aspects and food safety are statistically significant supported by a chi square of 25.505 and a reported p value of (0.000) which was less than (0.05) level of significance. The chi square results show that there is significant association between Hotel food safety control aspects and provision of safe food. Receiving food only from approved suppliers and food safety

are statistically significant supported by a chi square of 27.145 and a reported p value $0.000 < 0.05$. The chi square results show that there is significant association between receiving food only from approved suppliers and provision of safe food.

Hazard Analysis and Critical Control Point procedures at every step in the production process and food safety are statistically significant supported by a chi square of 33.913 and a reported p value $0.000 < 0.05$. The chi square results show that there is significant association between Hazard Analysis and Critical Control Point procedures at every step in the production process and provision of safe food. Hazard Analysis and Critical Control Point is an operation system that ensures that as many precautions as possible are undertaken to eliminate, minimize, or prevent any kind of contamination. Hazard Analysis and Critical Control Point identifies critical control points that relate to all transportation, handling, preparation, service, and storage of food products.

Storage conditions of all food and food safety are statistically significant supported by a chi square of 31.937 and a reported p value $0.000 < 0.05$. The chi square results show that there is significant association between storage conditions of all food and provision of safe food. Food storage control is an important step in the overall control of food costs.

Further, it was also established that protection from contamination - away from chemicals, physical and biological contaminants and food safety are statistically significant supported by a chi square of 25.505 and a reported p value $0.000 < 0.05$. The chi square results show that there is significant association between protection from contamination away from chemicals, physical and biological contaminants and food safety. The likely food-safety hazards are categorized into three classes: biological,

chemical and physical. Biological hazards include harmful bacteria, viruses or parasites. Chemical hazards include compounds that can cause illness or injury due to immediate or long-term exposure. Physical hazards include foreign objects in food that can cause harm when eaten, such as glass or metal fragments. These contaminations should be prevented in coming contact with food or food premises.

The results imply that 5 star hotels in Nairobi City County have in place food safety control in their operation. Food safety is about producing, handling, storing and preparing food in a manner that prevents infections or diseases and retains enough nutrients for a healthy diet. Confidence in the safety and integrity of the food supply is an important requirement for consumers. The results are in line with (Shi, 2017); Hazard Analysis and Critical Control Point management system have great applicability in improving the food quality and safety of hotels. The Hazard Analysis and Critical Control Point system helps operators of food businesses examine how food is handled and introduces procedures to ensure food produced is safe to eat.

Proper food handling and storage can prevent most food spoilage. Storage areas for such items often have design requirements that must be built into the space in order to efficiently handle the specific types of food. To enhance food safety, food processors must gain a working knowledge of potential hazards. To do so, food safety control system needs to be in place that keeps pace with the present environment in the food safety arena while addressing new challenges that impact on consumers (Damalie, 2015).

4.4.4 Correlation analysis for application of food safety systems

The study sought to establish the association among the indicators for the application of Food Safety systems and food safety. The results are as presented in Table 4.5.

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. Safe food provision calls for proper handling, preparation, and storage of food in ways that prevent food-borne illness.

Table 4.5: Correlation matrix for application of food safety systems

		Food safety	Food safety control	Food from approved suppliers	HACCP procedures in the production process	Storage conditions of all food	Protection from
Food safety	Pearson Correlation	1.000					
	Sig. (2-tailed)						
Food safety control	Pearson Correlation	.688**	1.000				
	Sig. (2-tailed)	0.000					
Food from approved suppliers	Pearson Correlation	.831**	.406**	1.000			
	Sig. (2-tailed)	0.000	0.000				
HACCP procedures in the production process	Pearson Correlation	.824**	.449**	.728**	1.000		
	Sig. (2-tailed)	0.000	0.000	0.000			
Storage conditions of all food	Pearson Correlation	.685**	.434**	.353**	.332**	1.000	
	Sig. (2-tailed)	0.000	0.000	0.000	0.000		
Protection from contamination	Pearson Correlation	.614**	.276**	.310**	.270**	.744**	1.000
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	

** Correlation is significant at the 0.01 level (2-tailed).

Results indicated that hotel food safety control aspects ($r=.688^{**}$, $p=0.000$) had positive significant association with food safety.

Receiving food only from approved suppliers had strong positive and significant association with food safety ($r= .831^{**}$, $p=0.000$). Food supplied to the hotel premises

and how the suppliers handle this food is of safety concern. The results are in line with (Onyeneho & Hedberg, 2013) that food safety starts from the food supplies agencies.

Results further showed that HACCP procedures at every step in the production process had strong positive significant association with food safety ($r = .824^{**}$, $p = .187$). The Hazard Analysis and Critical Control Point system helps operators of food businesses examine how food is handled and introduces procedures to ensure food produced is safe to eat. Hazard Analysis and Critical Control Point is an operation system that ensures that as many precautions as possible are undertaken to eliminate, minimize, or prevent any kind of contamination.

Storage conditions of all food also indicated a positive association with food safety ($r = .685^{**}$, $p = .000$). 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 rendering food unsafe for human consumption. Storing food should be based on type of food (very perishables, semi perishable and non-perishable food) in order to ensure that proper storage guidelines are observed. The results are in line with (Kendall & Dimond, 2007) that proper food storage helps to preserve the quality and nutritional value of the foods you purchase, and also helps make the most of your food dollar by preventing spoilage.

It was also noted that protection from contamination away from chemicals, physical and biological contaminants had positive significant association with food safety ($r = .614^{**}$, $p = .187$). Food contamination can occur at any stage from production to consumption. There are possibilities of contamination with microbiological, chemical

and/or physical hazards in each step of food preparations. The necessary precautions should be taken to ensure that all foods that have been contaminated and that cannot be made safe by reprocessing are properly disposed of. Contamination may occur without visible signs hence proper food handling procedures need to be observed.

4.4.5 Application of Food Safety systems on food safety Regression Analysis

Table 4.6 presents model fit statistics for the regression model fitted to the data. The results show that application of food safety systems explained 43.8% of variation in food safety. Food safety control system needs to be in place that keeps pace with the present environment in the food safety arena while addressing new challenges that impact on consumers. The successful application of these principles requires hotels to have the essential foundations of a food safety system in place. The results agree with (Wandolo, 2016) that food safety system prerequisites are critical in ensuring food safety.

Table 4.6: Model fit

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.662	.438	.436	.48631

Table 4.7 presents the Analysis of Variance (ANOVA) statistics. The results indicate that the model with one predictor variable (application of food safety systems) was statistically significant and predicts the dependent variable (food safety). This results is supported with the F-Statistic equal to 5.239 and the calculated p-value equal to $0.023 < 0.05$.

Table 4.7: Analysis of variance

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	6.568	1	6.568	5.239	.023
Residual	229.425	183	1.254		
Total	235.993	184			

The regression coefficients of the model were presented in Table 4.8. From the analysis, hotel food safety control aspects was found to have a positive and significant relationship with food safety ($\beta=.112$, $p=0.003<0.05$). Food safety is very important for the wellbeing and safety of hotel guests and visitors. Food safety aspects include proper food handling procedures when preparing, storing and serving food.

Receiving food only from approved suppliers and food safety were positively and significantly related ($\beta=.068$, $p=0.020<0.05$). Food safety concern is how food is supplied to the hotel premises and how the suppliers handle this food. Foods must be obtained from suppliers with proven safety records and standards. The results are in line with (Onyeneho & Hedberg, 2013) that food safety starts from the food supplies agencies. In an interview manager 7 indicated:

“...our hotel ensures that food is sourced from certified food suppliers. The hotel also has experts to ensure that the food supplied is safe for consumption.”

Hotel manager 7

HACCP procedures at every step in the production process was found to have a positive and significant relationship with food safety ($\beta=.134$, $p=0.000<0.05$). Hazard

analysis is key to any food safety management system, since conducting a hazard analysis assists in organizing the knowledge required to establish an effective combination of control measures. Food safety systems based on Hazard analysis have been widely acclaimed as an effective means for producing safe food. Principles of Food Hygiene, the Hazard analysis system identifies specific hazards and measures for their control to ensure the safety of food.

Storage conditions of all food and food safety were positively and significantly related ($\beta=.122$, $p=0.027<0.05$). A unit improvement in storage conditions would lead to a unit improvement in food safety served by star hotels by .122. The results imply that proper food storage enhances food safety. Manager 2, in an interview indicated:

“...proper storage will help in retention of nutritional and functional properties of a food / food product by preventing microbial spoilage.” Hotel manager 2

Protection from contamination - away from chemicals, physical and biological contaminants and food safety were positively and significantly related ($\beta=.386$, $p=0.000<0.05$). This implies that application of food safety systems enhances food safety. To enhance food safety, food processors must gain a working knowledge of potential hazards. The likely food-safety hazards are categorized into three classes: biological, chemical and physical. Biological hazards include harmful bacteria, viruses or parasites. These contaminations are the commonest source of contamination that renders food unfit for human consumption and thus must be prevented through adoption of proper food handling practices.

Table 4.8: Regression coefficients

Model	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
	B	Std. Error			
(Constant)	2.229	.338		6.595	.000
Hotel food safety control aspects	.112	.027	.043	4.148	.003
Food from only approved suppliers	.068	.040	.036	2.833	.020
HACCP procedures in the production process	.386	.055	.121	7.018	.000
Storage conditions of all food	.122	.034	.034	3.588	.027
Protection from contamination	.134	.020	.068	6.700	.000

a. Dependent Variable: food safety

The specific model was:

$$\text{Food safety} = 2.229 + .386X_3 + .134X_5 + .122X_4 + .112X_1 + .068X_2$$

Where X_1 is Hotel food safety control aspects, X_2 = Receiving food only from approved suppliers, X_3 = HACCP procedures at every step in the production process, X_4 = Storage conditions of all food, X_5 = Protection from contamination - away from chemicals, physical and biological contaminants.

4.4.6 Hypothesis testing for application of food safety systems

The hypothesis was tested using the simple linear regression model as shown in Table

4.8. The study sought to test the given null hypothesis:

H₀₁: Application of Food Safety standards has no significant relationship with food safety in 5-star hotels in Nairobi County.

The hypothesis was tested using p-value method. The acceptance/rejection criterion was that, if the p value is greater than the significance level of 0.05, we fail to reject the H₀₁ but if it is less than 0.05 level of significance the H₀₁ is rejected. Results in Table 4.8 indicate that the p-values for the indicators were significant (p<0.005). The null hypothesis was therefore rejected. The alternative hypothesis was accepted that application of food safety systems has a significant relationship with food safety. Manager 3 opined in the interview:

“...the various food safety systems like Hazard critical analysis and Sanitation Standard Operating Procedures have been adapted to enhance food safety.”

Hotel manager 3

The results are in agreement with (Mwamakamba, et al., 2012) effective food safety control systems are essential to protect the health and safety of consumers by assuring the safety of foods consumed is of required safety standard.

To complement these finding, observation carried out in the hotels revealed that majority of five star hotels (90%) indicated that the premises is designed, laid out and built to ensure good hygiene and had adequate lighting in all areas of the premise. Further, majority of premise had hot/cold running water at wash basins and hands drying materials. Hand washing and sanitary facilities in the premises were in good condition and adequate, while food washing and hands washing have separate facilities.

4.5 Objective 2: Compliance with the food safety systems

The second objective was to ascertain compliance with the food safety systems by the food handler's. The objective was analyzed by employing descriptive statistics and inferential analysis. Hypothesis testing was also conducted in this section.

4.5.1 Descriptive statistics

The study determined how compliance with the food safety systems influences provision of safe food. The participants of the study responded to statements related to compliance of the food safety systems. Result findings were presented in Table 4.9.

Table 4.9 showed that majority 76.3% agreed that right uniform is worn by staff. The results also showed that majority of the respondents 67.2% indicated that hygienic procedures are followed by staff when working with food. The results also showed that majority of the respondents 74.3% of the respondents agreed that the staff wash hands using soap.

Table 4.9: Compliance with the food safety systems

Personal hygiene procedures	Yes	No	Don't know	Mean	Std. Dev
Right uniform is worn by staff	76.3%	20.7%	3.2%	1.1	0.4
Hygienic procedures when working with food	67.2%	30.1%	2.7%	1.1	0.3
Staff wash hands using soap	74.3%	25.7%	0.0%	1.0	0.0
Staff don't work with food when sick and report illnesses	75.2%	10.2%	14.6%	1.3	0.7
Environmental hygiene					
Maintain equipment and work area clean using a disinfectant	72.9%	29.1%	0.0%	1.0	0.0
Follow a cleaning schedule	70.1%	24.0%	5.9%	1.1	0.5
All pest sightings are reported	71.8%	17.6%	1.6%	1.0	0.3
We control vermin	78.0%	20.4%	1.6%	1.0	0.3
Food storage					
Stock is rotated on a first in first out basis	73.1%	21.0%	5.9%	1.1	0.5
Food is kept & maintained at the right temperature	73.6%	26.4%	0.0%	1.0	0.0
Temperature of fridges and freezers checked regularly	85.0%	15.7%	4.3%	1.1	0.4
Food is cooked to the right temperature	80.0%	20.0%	0.0%	1.0	0.0
Contamination prevention					
Staff follow personal hygiene procedures	82.3%	15.0%	2.7%	1.1	0.3
Raw fruit and vegetables washed	83.3%	16.7%	0.0%	1.0	0.2
Raw and cooked food kept separately	85.7%	14.3%	0.0%	1.0	0.2
Separate equipment used for raw and cooked food	86.5%	9.2%	4.3%	1.2	0.5
Average				1.1	0.4

Further, 75.2% of the respondents agreed that staff don't work with food when sick and report illnesses. 72.9% of the respondents agreed that they maintain equipment and work areas clean using a disinfectant and that they follow a cleaning schedule with 70.1% of the respondents agreed. 71.8% agreed to the statement that all pest sightings are reported by Staff, while 78.0% agreed that they control vermin. 73.1% agreed that the stock is rotated on a first in first out basis, while food is kept and maintained at the

right temperature according to 73.6%. The results also showed that temperature of fridges and freezers are checked regularly 85.0% agreed that Food is cooked to the right temperature 80.0%. Further, that the staff follow personal hygiene procedures 82.3% agreed, that raw fruit and vegetables washed 83.3% that raw and cooked food kept separately 85.7% agreed while 86.5% agreed that Separate equipment is used for raw and cooked food. The average response was 1.1 an indication that majority of the respondents were agreeing to the statements in the questionnaire. The standard deviation was 0.4, an indication that responses were clustered around the average mean response.

4.5.2 Paired t-test

Paired t-test between compliance with the food safety systems and food safety was computed to see if there is any statistically significant change in food safety.

Table 4.10: Paired t-test

	Mean	Paired Differences			t	df	Sig.
		Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower Upper			
Compliance of the food safety systems	.45027	1.13423	.08339	.61479 .28575	5.400	184	.000
Food safety							

The Paired t-test is presented in Table 4.10. The p value is $0.000 < 0.05$ and therefore the study concludes that there is statistically significant change in food safety as a result of compliance to food safety systems. The results are in agreement with (Panghal,

Chhikara, Sindhu, & Jaglan, 2018), that standard ensures safe food supply throughout the chain and provides a framework of internationally harmonized system for the global approach. This standard endorses conformity of services and products for international trading by assuring about reliability, food quality, and food safety. It is imperative for safe food-handling outcomes for all workers to be familiar with standard sanitation and hygiene practices. Proper personal hygiene is critical in any food service premise and includes: showering or bathing regularly, protective clothing, keeping hair clean hair and covered or tied back, keeping clean clothing and footwear that is used only at work, hand washing regularly, using clean utensils for tasting food and using separate cloths for cleaning and wiping plates. The results are in line with (Ismail, Chik, Muhammad, & Yusoff, 2016) food handlers must maintain high standards of personal hygiene in promoting food safety of food consumed and that there is positive relationship between food safety knowledge personal hygiene and food hygiene practices among mobile food handlers.

Further, food safety and environmental hygiene is inseparable. It is also necessary to check on the process of production at source, the preparation of food, its storage and transport to ensure that the food is safe to consume. In short, without a hygienic environment, food safety cannot be guaranteed as food has to pass through different stages of the food chain before it is consumed.

4.5.3 Cross tabulation between compliance with the food safety systems and food safety

A cross tabulation table was presented to illustrate food safety for those hotels that comply with food safety systems and those that do not. The cross tabulation results are presented in Table 4.11.

Table 4.11: Cross tabulation between compliance with the food safety systems and food safety

		Food safety		χ	p-value	comment
		Safe	not safe			
Personal hygiene procedures	yes	109	6	8.894	0.004	significant
	no	37	33			
	Don't know	-	-			
Environmental hygiene	yes	98	10	7.370	0.011	significant
	no	42	35			
	Don't know	-	-			
Food storage	yes	109	16	11.992	0.001	significant
	no	31	29			
	Don't know	-	-			
Contamination prevention	yes	104	56	26.868	0.000	significant
	no	0	17			
	Don't know	5	3			

The results showed that personal hygiene procedures by the staff and food safety are statistically significant supported by a chi square of 8.894 and a reported p value

0.004<0.05. The chi square results show that there is significant association between personal hygiene procedures by the staff and food safety.

“...personal hygiene is the most basic fundamentals in promoting food safety. In this hotel, the staff observe high level of personal hygiene that include washing hands and wearing clean, suitable and appropriate protective clothing. Maintaining high standards of personal hygiene and cleanliness is an important way to prevent food contamination.” Hotel manager 4

Poor personal hygiene practices such as improper hand washing technique undermines the safe handling of food. Good personal hygiene can prevent food poisoning. Bacteria that cause food poisoning can be on everyone even healthy people. You can spread bacteria from yourself to the food if you touch your nose, mouth, hair or your clothes, and then food. Good personal hygiene also makes good business sense. Customers like to see food-handling staff that take hygiene seriously and practice safe food handling.

Environmental hygiene and food safety are statistically significant supported by a chi square of 7.370 and a reported p value 0.001<0.05. The chi square results show that there is significant association between environmental hygiene and food safety. Food safety is highly influenced by many environmental factors. Food must be prepared and served under good environmental conditions to prevent contamination. The results agree with (Oghenekohwo, 2015) that the relationship between food hygiene and environmental hygiene is positive in ensuring safety standard in food as a major issue in environmental health practices.

Food storage and food safety are statistically significant supported by a chi square of 11.992 and a reported p value $0.001 < 0.05$. The chi square results show that there is significant association between safe food storage and provision of safe food. Preventing food contamination and food safety are statistically significant supported by a chi square of 26.868 and a reported p value $0.000 < 0.05$. The chi square results show that there is significant association between preventing food contamination and provision of safe food. Food should be stored in a clean environment free of hazards and other possible contaminants.

4.5.4 Correlation analysis for compliance with the food safety systems

The study sought to establish the association among the indicators for the compliance of the food safety systems and food safety. The results are as presented in Table 4.12.

Table 4.12: Correlation matrix for compliance with the food safety systems

		Food safety	Personal hygiene procedures	Environmental hygiene	Food storage	Contamination prevention
Food safety	Pearson Correlation Sig. (2-tailed)	1.000				
Personal hygiene procedures	Pearson Correlation Sig. (2-tailed)	.349**	1.000			
Environmental hygiene	Pearson Correlation Sig. (2-tailed)	.390**	.226**	1.000		
Food storage	Pearson Correlation Sig. (2-tailed)	0.537	0.089	.385**	1.000	
Contamination prevention	Pearson Correlation Sig. (2-tailed)	0.451	0.050	0.016	.531**	1.000
		0.010	0.495	0.834	0.000	

** Correlation is significant at the 0.01 level (2-tailed).

Results indicated that personal hygiene procedures ($r=.349^{**}$, $p=0.000$) indicated positive significant association with food safety. Staff needs to always wash hands before handling food. Clean protective clothing must be worn by food workers to protect food from contamination and also offers personal protection from burns and other injuries. It is important for safe food-handling outcomes for all workers to be familiar with standard personal sanitation and hygiene practices. According to (Ismail,

Chik, Muhammad, & Yusoff, 2016), there is positive relationship between food safety knowledge personal hygiene and food hygiene practices among food handlers.

Environmental hygiene had a positive significant association with food safety ($r=.390^{**}$, $p=0.000$). In an interview session with hotel manager 5, he opined;

“...food must be prepared and served under good environmental conditions to prevent contamination. Food should be stored in a clean environment free of impurities and other possible contaminations.” Hotel manager 5

The surrounding environment where food is stored, prepared and served must meet acceptable standards of hygiene. The results agree with (Oghenekohwo, 2015) that the relationship between food hygiene and environmental hygiene is positive in ensuring safety standards in food as a major issue in environmental health practices.

Results further showed that food storage had a positive and significant association with food safety ($r= 0.537$, $p=0.026$). Food storage broadly refers to the different means through which food can be kept for longer periods without the food spoiling. Food served in the hotels ought to be stored in clean places free of any possible contaminations. Preventing contamination indicated a positive significant association with food safety ($r= 0.451$, $p=0.010$). Elements that result in food contamination can be prevented by observing proper food handling procedures. Mechanisms to prevent contamination resulting from chemicals, physical and biological must be enforced by the hotel service provider.

4.5.5 Compliance with the food safety systems Regression Analysis

Table 4.13 presents model fit statistics for the regression model fitted to the data. The results show that compliance to food safety systems explains 45.2% of variation in food safety.

Table 4.13: Model fit

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.672	.452	.451	.48007

Table 4.14 presents the Analysis of Variance (ANOVA) statistics. The results indicate that the model with one predictor variable (compliance to food safety systems) was statistically significant and predicts the dependent variable (food safety). This results is supported with the F-statistic equal to 87.292 and the calculated p-value equal to $0.000 < 0.05$. Several factors are known to favour food borne disease or food poisoning during food handling processes. These factors include poor personal and environmental hygiene, poor storage of food, improper preparation and cooking, carrier state such as with unclean hands.

Table 4.14: Analysis of variance

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	67.132	1	67.132	87.292	.000
Residual	81.354	183	.230		
Total	148.486	184			

The regression coefficients of the model were presented in Table 4.15.

Table 4.15: Regression coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.513	.681		2.220	.028
Personal hygiene procedures	1.012	.311	.241	3.254	.001
Environmental hygiene	.774	.347	.117	2.231	.043
Food storage	.399	.139	.075	2.871	.037
Contamination prevention	.721	.354	.139	2.037	.046

a. Dependent Variable: food safety

The specific model was:

$$\text{Food safety} = 1.513 + 1.012X_1 + .774X_2 + .399X_3 + .721X_4$$

Where X_1 is Personal hygiene procedures, X_2 = Environmental hygiene, X_3 = Food storage, X_4 = Contamination prevention.

Personal hygiene procedures and food safety were positively and significantly related ($\beta=1.012$, $p=.001 < 0.05$). A unit improvement in personal hygiene would lead to a unit improvement in food safety by 1.012. The results imply that personal hygiene is an essential element of food safety. As personal hygiene is needed among food vendors, the actions that hotel service providers take affects the safety of the food served to customers. It is important for safe food-handling outcomes for all workers to be familiar with standard personal sanitation and hygiene practices. The results tally with (Ismail, Chik, Muhammad, & Yusoff, 2016), that there is positive relationship between

food safety knowledge, personal hygiene and food hygiene practices among food handlers. The results also agree with (Adebitan, 2016), that the level of compliance with hygiene and sanitation regulations, influenced level of food safety served in food outlets.

Environmental hygiene had a positive and significant relationship with food safety ($\beta=.774$, $p=0.043<0.05$). A unit improvement in environmental hygiene would lead to a unit improvement in food safety by 0.774. The results imply that environmental hygiene enhances food safety. The environment where food is prepared, stored and served should be clean and free of contaminations. Hygiene in the workplace is an important issue. Environmental condition refers to the operating area and those conditions wherein equipment and food may be stored. Environmental conditions impact the safety and suitability of food, affecting chemical or physical deterioration or the growth of pathogenic microorganisms. Food safety management system requires the organization to build capacity of identifying and controlling all hazards for safe consumption.

Food storage had a positive and significant relationship with food safety ($\beta=.399$, $p=0.037<0.05$). A unit improvement in food storage would lead to a unit improvement in food safety 0.399. The results imply that the mode of food storage determines safety of food in hotel service providers. In an interview session with hotel manager 6, he opined;

“...Food served in the hotels ought to be stored in clean places free of any possible contaminations. Proper food handling and storage can prevent food from getting spoiled.” Hotel manager 6

Proper handling and storage practices can help protect investment by preserving the quality and ensuring the safety of food. Proper storage will help in retention of nutritional and functional properties of food / food product by preventing microbial spoilage. Although proper food storage does not improve the original quality of food, it prevents further deterioration and quality of food.

Contamination prevention had a positive and significant relationship with food safety ($\beta=.721$, $p=0.046<0.05$). Elements that result in food contaminations can be prevented by observing proper food handling procedures. Mechanisms to prevent contamination resulting from chemicals, physical and biological must be enforced by the hotel. Food handling practices should ensure that food is not exposed to any hazards. Poor handling practices can result in food being contaminated. In an interview session with hotel manager 7, he opined;

“...safe food is void of contamination. Most contamination falls into category of biological, physical and chemical elements. In this hotel, there are proper mechanisms to prevent food contamination that include separate food stores, kitchens and other hotel facilities.” Hotel manager 7

Contamination occurs when harmful bacteria are transferred from contaminated food to uncontaminated food. Cross contamination occurs when bacteria or viruses are transferred from a contaminated surface to a one which is not contaminated. Bacteria or

viruses can come from people, work surfaces, equipment, or other foods. The accumulation of refuse in kitchens due to insufficient refuse disposal facilities leads to an increased pest population and results in an increased risk of food contamination. Food handlers should understand the safety of food is affected by how they do handle their work. Maintaining high standards of personal hygiene and cleanliness is an important way to prevent food contamination.

4.5.6 Hypothesis testing for compliance with food safety systems

The hypothesis was tested using the simple linear regression model as shown in Table 4.15. The study sought to test the given null hypothesis:

H₀₂: Food handler's compliance with Food Safety systems has no significant effect on food safety in 5-star hotels in Nairobi County.

The hypothesis was tested using p-value method. The acceptance/rejection criterion was that, if the p value is greater than the significance level of 0.05, we fail to reject the H₀₂ but if it's less than 0.05 level of significance the H₀₂ is rejected. Results in Table 4.15 indicate that p-values for the indicators were significant ($p < 0.005$). The null hypothesis was therefore rejected. The alternative hypothesis was accepted that compliance to food safety systems has a significant relationship with food safety. The results agree with (Silva, Fonseca, & Sousa, 2016) that adherence to food safety systems ensures the safety of foods. The proliferation of laws and regulations to Food safety management system standards are the response to concerns of consumer. Hotels that comply with food safety system were guaranteed of safe food as compared to those that did not. In an interview manager 6 indicated:

“The hotel management is committed to serving safe food by adhering to the prerequisites outlined in the HACCP system.” Hotel manager 6

To complement these findings, observations carried out in the hotels revealed that all five star hotels had moveable equipment to ensure cleaning of surrounding areas equipment and that the fittings, equipment and utensils are made of materials that can be kept clean. In the kitchen areas, all the five star hotels had enough tools, equipment and facilities for cleaning purposes while the floors, walls, ceiling and other surfaces are maintained clean.

Under, personal hygiene, all food handling staffs wore clean, suitable and appropriate protective clothing for all the five star hotels. All the staff of the five star hotels handling food washes their hands after using the toilet. Wearing of hair restraints such as nets, hats or scarves, which are effective in keeping their hair in control was observed while preparing or serving food. While not wearing rings, earrings, bracelets, necklaces, and other jewelry while preparing or serving food was also observed.

4.6 Objective 3: Implementation of food safety systems

The third objective was to establish the impact on implementation of food safety systems in food handling practices in 5-star Hotels in Nairobi County. The objective was analysed by employing descriptive statistics and inferential analysis. Hypothesis testing was also conducted in this section.

4.6.1 Descriptive statistics

The study established the impact on implementation of food safety systems in food handling practices. The participants of the study responded on statements related to the

implementation of food safety systems in food handling practices. Result findings were presented in Table 4.16.

Table 4.16: implementation of food safety systems

Impact of food handling practices at the hotel	Always	Sometimes	Rarely	Very rarely	Never	Mean	Std. Dev
Written SOP followed	74.6%	15.7%	0.0%	3.2%	6.5%	1.2	1.1
Proper hand washing practices followed	70.8%	19.5%	3.2%	0.0%	6.5%	1.3	1.0
Raw and cooked foods stored separately	77.3%	10.3%	2.7%	0.0%	9.7%	1.4	1.2
Waste properly disposed	78.9%	8.6%	2.7%	0.0%	9.7%	1.2	1.2
New employees inducted & receive training	68.1%	14.6%	5.9%	4.9%	6.5%	1.4	1.2
Average						1.4	1.2

That there is written standard operating procedures for cleaning and disinfecting equipment and facilities is followed, 74.6% indicated always. That all food production and service personnel follow proper hand washing practices, 70.8% of the respondents indicated always. Further, raw and cooked foods are stored separately, 77.3% agreed, while waste is properly disposed as required, 78.9% agreed. New employees are inducted to receive all the training they need to perform their jobs according to food safety rules 68.1% of the respondents agreed. The average response was 1.4, an indication that majority of the respondents were agreeing to the statements in the questionnaire. The standard deviation was 1.2, an indication that responses were clustered around the average mean response.

4.6.2 Paired t-test

Paired t-test between implementation of food safety systems and food safety was computed to see if there is any statistically significant change in food safety. The Paired t-test is presented in Table 4.17.

Table 4.17: Paired t-test

	Mean	Paired Differences			t	df	Sig.
		Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower Upper			
Implementation of food safety systems	.01838	.28569	.02100	.02306 .05982	3.875	184	.023
Food safety							

The p value is $0.023 < 0.05$ and therefore we conclude that there is statistically significant change in food safety resulting from implementing food safety systems. The implementation of food systems including hazard analysis and other food safety policies are essential in ensuring food safety. The results are in agreement with (Nyarugwe, Linnemann, Hofstede, Fogliano, & Luning, 2016), who conducted a study on food safety management and associated food handler behaviours and established that the implementation of the hand washing requirements was not aligned with accepted norms due to the lack of sufficient hand wash basins.

4.6.3 Cross tabulation between Implementation of food safety systems and food safety

A cross tabulation table was presented to illustrate food safety for those hotels that implement food safety systems and those that do not. The results are presented in Table 4.18.

Table 4.18: Cross tabulation between Implementation of food safety systems and food safety

		Food safety		χ	p-value	Comment
		Safe	not safe			
Written standard operating procedures followed	always	106	32	72.338	0.000	significant
	sometimes	3	26			
	very rarely	0	6			
	never	0	12			
Proper hand washing practices followed	always	106	25	90.063	0.000	significant
	sometimes	3	33			
	rarely	0	6			
	never	0	12			
Raw and cooked foods are stored separately	always	109	34	77.929	0.000	significant
	sometimes	0	19			
	rarely	0	5			
	never	0	18			
Waste is properly disposed as required	always	109	37	70.876	0.000	significant
	sometimes	0	16			
	rarely	0	5			
	never	0	18			
New employees are inducted & receive training	always	106	20	104.469	0.000	significant
	sometimes	3	24			
	rarely	0	11			
	very rarely	0	9			
	never	0	12			

The results showed that written standard operating procedures for cleaning and disinfecting equipment and facilities is followed and food safety are statistically significant supported by a chi square of 72.338 and a reported p value $0.000 < 0.05$. The chi square results show that there is significant association between writing standard operating procedures for cleaning and disinfecting equipment and facilities is followed and food safety. Ensuring that all food production and service personnel follow proper hand washing practices and food safety are statistically significant supported by a chi square of 90.063 and a reported p value $0.000 < 0.05$.

Ensuring that raw and cooked foods are stored separately and food safety are statistically significant supported by a chi square of 77.929 and a reported p value $0.000 < 0.05$. The chi square results show that there is significant association between ensuring that raw and cooked foods are stored separately and provision of safe food. It was also established that disposing waste properly and food safety are statistically significant supported by a chi square of 70.876 and a reported p value $0.000 < 0.05$. The chi square results show that there is significant association between proper waste disposal and provision of safe food. Ensuring that new employees are inducted and receive all the training they need to perform their jobs according to food safety rules and food safety are statistically significant supported by a chi square of 104.469 and a reported p value $0.000 < 0.05$. The chi square results show that there is significant association between ensuring that new employees are inducted and receive all the training they need to perform their jobs according to food safety rules and provision of safe food. The best and most effective method of assuring food safety is to establish a

systematic and continuous training and education for the food handlers in hospitality. Once the food safety issues are understood the hazard and its risks in foods can be minimized.

Effective food safety management, including the adoption of safe food handling practices learnt during food safety training programmes, is thus an important strategy to limit incidences of food poisoning. Food hygiene training is significant to equip food handlers with knowledge and skills to handle food safely. Routine appraisals of the effectiveness of the training should be made together with periodic supervision to enforce adherence to hygienic procedures.

4.6.4 Correlation analysis for Implementation of food safety systems

The study sought to establish the association among the indicators for the Implementation of food safety systems and food safety. The results are as presented in Table 4.19.

Table 4.19: Correlation matrix for implementation of food safety systems

		food safety	Written SOP is followed	Proper hand washing practices followed	Raw & cooked foods stored separately	Waste properly disposed as required	New employees inducted & receive training
food safety	Pearson Correlation	1.000					
	Sig. (1-tailed)						
Written SOP is followed	Pearson Correlation	0.353*	1.0000				
	Sig. (1-tailed)	0.018					
Proper hand washing practices followed	Pearson Correlation	0.382*	.948**	1.000			
	Sig. (1-tailed)	0.022	0.000				
Raw and cooked foods stored separately	Pearson Correlation	0.209	.960**	.881**	1.000		
	Sig. (1-tailed)	0.007	0.000	0.000			
Waste properly disposed as required	Pearson Correlation	.512*	.954**	.862**	.984**	1.000	
	Sig. (1-tailed)	0.019	0.000	0.000	0.000		
New employees inducted & receive training	Pearson Correlation	.417*	.796**	.861**	.782**	.789**	1.000
	Sig. (1-tailed)	0.023	0.000	0.000	0.000	0.000	

* Correlation is significant at the 0.05 level (1-tailed).

Results indicated that written standard operating procedures for cleaning and disinfecting equipment and facilities is followed ($r=0.353^*$, $p=0.018$) indicated positive significant association with food safety. All food production and service personnel follow proper hand washing practices had a positive and significant association with food safety ($r= 0.382^*$, $p=0.022$). Raw and cooked foods are stored separately had a positive significant association with food safety ($r= 0.209$, $p=0.007$). Waste is properly disposed as required also indicated a positive association with food safety ($r= .512^*$,

p=0.019). It was also noted that new employees are inducted receive all the training they need to perform their jobs according to food safety rules had positive significant association with food safety ($r = .417^*$, $p=0.023$). In an interview manager, they opined;

“..the hotel management is committed to serving safe food by implementing food safety standards.” Hotel manager 8

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. Pre-operational procedures address the cleaning of food, contact surfaces of facilities, equipment, and utensils. Hotel management is responsible for implementing and maintaining the procedures are identified; records are identified and are kept, on a daily basis. The hazard critical analysis have been accepted and implemented as an effective means of managing food safety risks.

4.6.5 Implementation of food safety systems Regression Analysis

Table 4.20 presents model fit statistics for the regression model fitted to the data. The results show that implementation of food safety systems explains 40.2% of variation in food safety.

Table 4.20: Model fit

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.602	.402	.390	.51811

Table 4.21 presents the Analysis of Variance (ANOVA) statistics. The results indicate that the model with one predictor variable (implementation of food safety systems) was statistically significant and predicts the dependent variable (food safety). This results is supported with the F-statistic equal to 109.188 and the calculated p-value equal to $0.000 < 0.05$.

Table 4.21: Analysis of variance

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	220.977	1	220.977	109.188	.000
Residual	15.015	183	.082		
Total	235.993	184			

The regression coefficients of the model were presented in Table 4.22.

Table 4.22: Regression coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.021	.032		.682	.496
Written SOP followed	.462	.112	.453	4.129	.000
Proper hand washing practices followed	.775	.084	.717	9.244	.000
Raw & cooked foods stored separately	.736	.089	.032	.337	.030
Waste properly disposed as required	.770	.097	.827	7.941	.000
New employees inducted & receive training	.111	.035	.117	3.140	.002

a. Dependent Variable: food safety

The specific model was:

$$\text{Food safety} = .021 + .462X_1 + .775X_2 + .770X_3 + .111X_4$$

Where X_1 is written standard operating procedures for cleaning and disinfecting equipment and facilities is followed, X_2 = all food production and service personnel follow proper hand washing practices, X_3 = Waste is properly disposed as required, X_4 = New employees are inducted receive all the training they need to perform their jobs according to food safety rules.

The regression coefficients of the model were presented in Table 4.22. Written standard operating procedures for cleaning and disinfecting equipment and facilities is followed and food safety were positively and significantly related ($\beta=.462$, $p=0.000<0.05$), all food production and service personnel follow proper hand washing practices was found to have a positive and significant relationship with food safety ($\beta=.775$, $p=0.000<0.05$), raw and cooked foods are stored separately and food safety were positively but insignificantly related ($\beta=.030$, $p=.736<0.05$), waste is properly disposed as required and food safety were positively and significantly related ($\beta=.770$, $p=.000<0.05$) while new employees are inducted receive all the training they need to perform their jobs according to food safety rules were positively and significantly related ($\beta=.111$, $p=0.002<0.05$). According to (Lutchman, Ghanem, & Maharaj, 2016), managers are responsible for making sure employees follow safe food handling practices.

4.6.6 Hypothesis testing for implementation of food safety systems

The hypothesis was tested using the simple linear regression model as shown in Table 4.22. The study sought to test the given null hypothesis:

H₀₃: Implementation of Food safety Management system has no significant impact on food handling practices among the food handlers in 5-star hotels in Nairobi County.

The hypothesis was tested using p-value method. The acceptance/rejection criterion was that, if the p value is greater than the significance level of 0.05, we fail to reject the H₀₃ but if it's less than 0.05 level of significance the H₀₃ is rejected. Results in Table 4.22 indicate that the p-values for the indicators were significant ($p < 0.005$). Since the indicators of implementation of food safety management system were significant, the null hypothesis was therefore rejected. In an interview session with hotel manager 9, they opined;

“...the hotel management is committed to serving safe food by implementing food safety standards.” Hotel manager 9

(Unnevehr & Hoffmann, 2015), reiterate that the application of food safety system is important in promoting safe food handling behaviour. According to (Morse, Masuku, Rippon, & Kubwalo, 2018), there is a significant threat to public health and market access due to uncoordinated, outdated or incomplete regulatory framework, poorly defined mandates, limited infrastructure, lack of equipment and skilled personnel, inadequate resources, and limited awareness and ability to comply with standards. Food safety and hygiene improvements must strike a balance between market access gains and protection of public health. Hotels that implement food safety systems were guaranteed of safe food as compared to those that did not.

To complement these finding, observations carried out in the hotels revealed that food handlers are trained in food hygiene and are closely supervised in majority of the five

star hotels. Washing of hands regularly, especially before preparation or eating food and after visiting the toilet, is crucial to preventing cross contamination of food and majority food handling staff took hygiene seriously and practiced safe food handling. The simple act of washing hands regularly is an effective way to keep germs from spreading. When preparing and cooking food, it was observed the food handlers wore protective clothing - use of clean gloves, aprons, towels. Majority of the five star hotels held their food at appropriate temperature before service.

4.7 Overall Model specification

Inferential statistics was used to make inferences and predictions regarding the population of this study. A regression model was estimated. The Model summary results are presented in Table 4.23.

Table 4.23: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.846	.752	.651	.25005

The coefficient of determination indicates the deviations in the response variable that is as a result of changes in the predictor variables. From the outcome in table 4.23, the value of R square was .752, an indication that 75.2 percent of the deviations in the provision of safe food by hotels are caused by application of standard Food safety systems, compliance to food safety system and implementation of food safety system. Also, the results reveal that there exists a strong relationship among the selected independent variables and provision of safe food as indicated by the correlation

coefficient of 75.2 %. The potential effects of the safety and suitability of food should be considered at all times in the production activities. In particular, this includes identifying any points in the production activities where contamination may exist and taking definite corrective measures to minimize that probability.

Food hygiene practices cover what staff must do to keep things clean so they do not contaminate food. According to (Brkti, Dejen, & Lalit, 2015), food handlers, in developed and developing countries including Kenya, with insufficient understanding of food hygiene and food safety are contributing factors of the food borne illness outbreaks. Knowledge by food handlers about food borne infections and their safety practices is an important issue in the outbreaks of food borne illnesses. Food handlers may enable pathogenic organisms through disregard of hygienic measures and mishandling, to gain entry and in certain cases survive and increase in sufficient numbers to cause illness to the consumer. The results concur with (Psomas & Kafetzopoulos, 2015), that food safety systems should be based on HACCP as an effective means for producing safe food. Table 4.24 shows the ANOVA results of the study.

Table 4.24: Analysis of Variance

	Model	Sum of Squares	df	Mean Square	F	Sig.
	Regression	224.675	3	74.892	1197.753	.000
1	Residual	11.317	181	.063		
	Total	235.993	184			

The significance value is 0.000 which is less than critical p value of 0.05. This implies that the model was statistically significant in predicting how application of standard Food safety systems, compliance to food safety system and implementation of food safety system impact provision of safe food by hotels in Nairobi. The F value derived indicates that the overall model was significant. At 95% confidence level, a p-value of less than 0.05 was interpreted as a measure of statistical significance. As such, a p-value above 0.05 indicates a statistically insignificant relationship between the dependent and the independent variables. Food safety systems are established, operated and updated within the framework of a structured management system and incorporated into the overall management activities of the organization. The regression results of the model are as shown in Table 4.25.

Table 4.25: Regressions of coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.080	.026		3.077	.000
Application of standard Food safety systems	.202	.058	.039	3.483	.012
Compliance to food safety system	.214	.017	.984	12.588	.000
Implementation of food safety system	.318	.144	.113	2.208	.001

The regression model was estimated as:

$$Y = .080 + .202X_1 + .214X_2 + .318X_3$$

Where,

Y = Food safety of hotels in Nairobi

X₁ = Application of standard Food safety systems

X₂ = Compliance to food safety system

X₃ = Implementation of food safety system

From the above results, it is evident that application of standard food safety systems had a positive and statistically significant relationship with food safety of hotels in Nairobi City County ($\beta=.202$, $p = .012$). Application of food safety systems is essential in ensuring that safe food is served to hotel customers. Proper food handling procedures need to be observed from supply, preparation, consumption and storage of food in the hotels. The results are in agreement with (Mwamakamba, et al., 2012), effective food safety control systems are essential to protect the health and safety of consumers by assuring the safety of foods consumed meets required safety standard. The results also agree with (Moreb, Priyadarshini, & Jaiswal, 2017), that knowledge of food handling is significantly related with food handling practices.

It was also established that compliance to food safety system had positive and statistically significant relationship with food safety ($\beta=.214$, $p = .000$). Several factors are known to favour food borne disease or food poisoning during food handling processes. These factors include poor personal and environmental hygiene, poor storage

of food, improper preparation and cooking, carrier state such as with unclean hands. Hotels that comply with food safety system were assured of safe food as compared to those that did not. The results agree with (Griffith, Jackson, & Lues, 2017), safety culture of the organization influences the deployment and effectiveness of the safety management, policies, procedures and practices, as it represents the work environment and underlying perceptions, attitudes, and habitual practices of employees at all levels. Further, implementation of food safety system had a positive and statistically significant relationship with provision of safe food in Nairobi City County ($\beta=.318$, $p=.001$). In an interview manager 10 indicated:

“...this hotel has been consistent in implementing with food safety guidelines and procedures. The staff is actively involved in implementing various food safety guidelines.” Hotel manager 10

The implementation of food systems including hazard analysis and other food safety policies are essential in ensuring food safety. The results concur with (Zanin, da Cunha, de Rosso, Capriles, & Stedefeldt, 2017), that management systems are indispensable in each section of the food production operations, to ensure food quality that is safe for the consumer. Improving food handlers' food safety practices would result in a direct improvement in food safety. In another study conducted by (Kireziova, et al., 2015) in food handling processes, the report indicated that majority of foodborne disease outbreaks resulted from malpractices during food preparation in small food businesses. The study also observed that safe food handling practices learnt during food safety training programs were the best strategy to limit incidences of food poisoning.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter summarizes the findings of the previous chapter, conclusion and limitations encountered during the study. This chapter also highlights the policy recommendations that can be implemented by hotel management to enhance food safety. Lastly, the chapter presents suggestions for further research.

5.2 Summary of Findings

The study sought to determine role of food management system on safety of food in 5-star Hotels in Nairobi. Independent variables for this study were application of standard Food safety systems, compliance to food safety system and implementation of food safety system. The study adopted descriptive cross-sectional survey study. Primary data was collected using questionnaires and check list.

Hotel service providers have a mandate to ensure customers are served with safe food, free of contamination. To do so, food safety control systems need to be in place that keeps pace with the present environment in the food safety arena while addressing new challenges that impact on consumers. The successful application of these principles requires hotels to have the essential foundations of a food safety system in place.

The first objective was to evaluate the application of standard food safety system in the 5-star hotels. Application of food safety systems is essential in ensuring that safe food is served to hotel customers. Proper food handling procedures need to be observed from

supply, preparation, consumption and storage of food in the hotels. Paired t-test results established that there is statistically significant change in food safety as a result of applying food safety systems. Chi square test indicated that hotels that applied food safety systems provided safe food as compared to those that did not. Regression results showed that hotel food safety control aspects had a positive and significant relationship with food safety, receiving food only from approved suppliers had a positive and significant relationship with food safety.

Hazard Analysis and Critical Control Point is an operation system adapted in the management system, that ensures as many precautions as possible are undertaken to eliminate, minimize, or prevent any kind of contamination. Hazard Analysis and Critical Control Point identifies critical control points that relate to all transportation, handling, preparation, service, and storage of food products. The results are in line with (Shi, 2017) Hazard Analysis and Critical Control Point management systems have great applicability in improving the food quality and safety of hotels. HACCP procedures at every step in the production process had a positive and significant relationship with food safety.

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. The results are in line with

(Kendall & Dimond, 2007), that 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. The null hypothesis was rejected.

The second objective was to determine the effect of compliance to food safety systems on food safety. Paired t-test results established that there is statistically significant change in food safety as a result of complying with the food safety systems. Chi square test illustrated that hotels that complied with the food safety system standards provided safe food as compared to those that did not. Regression results indicated that personal hygiene procedures, environmental hygiene, food storage and contamination prevention had a positive and significant relationship with food safety. Hotels that complied with the food safety system standards provided safe food as compared to those that did not. The null hypothesis was rejected.

The third objective was to establish the effect of implementation of food safety systems on food safety in 5-star Hotels in Nairobi. Paired t-test results established that there is statistically significant change in food safety as a result of implementing the food safety systems. Chi square results indicated that hotels that implemented the food safety system provided safe food as compared to those that did not. Regression results indicated that written standard operating procedures for cleaning and disinfecting equipment and facilities is followed and had a positive and significant relationship with food safety.

Food management practices include handling practices, in order to ensure that all employees are able to carry out their roles effectively. All food production and service personnel follow proper hand washing practices, raw and cooked foods are stored separately, waste is properly disposed as required, new employees are inducted receive all the training they need to perform their jobs according to food safety rules had significant relationship with food safety. Hotels that implemented food safety system provided safe food as compared to those that did not. The null hypothesis was rejected.

5.3 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 5 star hotels in Nairobi City County.

The study found that that there is statistically significant improvement in food safety as a result of complying with food safety systems. The study therefore concludes that conforming to food safety systems leads to the provision of safe food in hotels.

The study also found that there is statistically significant improvement in food safety as a result of implementing food safety systems. 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 hotels.

5.4 Recommendations

The study established that application of standard food safety systems led to the provision of safe food in hotels. The study recommends that all hotels meet requirements and especially those of HACCP principles 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.

It was established that complying with food safety systems led to the provision of safe food in hotels. Recommendations are made for regulatory agencies in Nairobi City County to focus on a more proactive approach to food safety compliance by records verification rather than product testing. Developments in food safety regulation based in HACCP principles 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 in Nairobi City County. National Food Safety Policy and the National Food Nutrition and Security Policy should take the lead in ensuring that hotels take all relevant steps to assure food safety, traceability, monitoring and reporting.

It was established that implementing food safety systems impacts on the provision of safe food in hotels. The study recommends a close monitoring and supervision of the state of food offered in hotels by National Food Safety Policy and the National Food Nutrition and Security Policy. The government 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.

There is need for consumer education and awareness to engage the county governments on policies and regulation to defeat the monster of unsafe food in some hotels. Standardization is critical. Consumers must compel the authorities into action and make the entire value chain keener in ensuring safety in producing and handling food.

The Government should establish pre-requisite standard operation procedures in all institutions undertaking hospitality in relation to food safety.

There is need to create food safety awareness by holding workshops, seminars and sensitization programme to the stakeholders of hospitality industry.

The ministry of tourism should identify a monitoring team to visit hospitality training workshops to assess the capacity in terms of infrastructure, facilities and equipment to determine the level of requirement in every institution.

The government to establish a monitoring and surveillance team to check the capacity of institutions in terms of training facilities. This will not only assist in upgrading the institutions but will enable the Government to achieve equality particularly in hospitality training.

5.5 Suggestions for Further Research

The study focused mainly on five star hotels in Nairobi City County. Because these hotels command sufficient resources, are closely monitored by authorities in charge of food safety, there level of compliance to safe food is expected to be higher as compared to other hotels and restaurants in the City. There is need to conduct a study on the role

of management systems on food hygiene practices of small and medium hotels in Nairobi City County.

There is also need to conduct study on the training and capacity building in hospitality training institution as relates to food safety.

Study can also be conducted on potential impact of foodborne illness outbreaks in hotels or food outlets on tourism and the economy.

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APPENDICES**APPENDIX 1: LIST OF FIVE-STAR HOTELS IN NAIROBI****(THE KENYA GAZETTE Vol, CXYIII-No. 143 NAIROBI, 18Th November, 2016)**

<u>HOTEL</u>	<u>LOCATION</u>
1. Fairmont The Norfolk Hotel	Harry Thuku Road
2. The Sarova Stanley Hotel	Kenyatta avenue
3. The Tribe Hotel	Limuru Road
4. Villa Rosa Kempinski Hotel	Waiyaki Way
5. Sankara Nairobi Hotel	Woodvale Grove, Westlands
6. Hemingways Nairobi Hotel	Mbagathi Ridge
7. Dusit D2 Hotel	Off Riverside Drive
8. Radisson Blu Hotel	Elgon Road, Upper Hill
9. Intercontinental Nairobi	CBD
10. The Boma Nairobi	South 'C'

APPENDIX 2: RESEARCH BUDGET

No.	Tasks / items in research	Total cost Kenya shillings (Ksh)
1	Material: Procure Laptop for the research work Proposal writing: Literature review transport to different libraries for material photocopying and internet services	45,000 20,000
2	Data collection Research instruments - including typing, printing, photocopy, pretest. Training of three research assistants to assist in data collection Administration of research instrument - Airtime & transport to different hotels for three research assistants for 10 days	15,000 5,000 60,000
3	Data analysis Purchase of software programme and payment for an assistant to data code and entry	10,000
4	Research report Typing of draft research, printing and binding Final copy for examination - for submission Transport during defense contingency	15,000 2,000 5,000 5,000
	TOTAL	182,000

APPENDIX 3: RESPONDENTS QUESTIONNAIRE - FOOD HANDLERS

I am a Post-Graduate student at Kenyatta University. I am carrying out a research on Food Safety Management in 5-star hotels in Nairobi. The questionnaire is designed to gather information on the same. Kindly assist me by answering as accurately as possible. Any information provided will be treated as confidential and only for academic purposes.

Thank you.

Name of Hotel _____

Date _____

Section A. Demographic data

1. Education level: No schooling Primary Secondary

College

University completed Others - specify _____

2. Highest Qualification attained _____

3. Number of years of employment in this hotel _____ 4. Department _____

5. Designation of respondent _____

6. Have you received any training in FSM? Yes No

If yes, for how long? Less than three months More than three months

Less than One year

More than one year

7. Where did you receive you training: _____

College

University

On the Job

Section B. Management Systems & Food Safety Measures

A food safety management system aims to prevent, identify and reduce food borne hazards.

1. Does the hotel have in place a documented Food Safety?

Yes No Don't know

2. Does the hotel have Hazard Analysis Critical Point (HACCP) program?

Yes No Don't know

3. Does the Food Safety address

Tick as appropriate

1	Hotel food safety	YES	NO	DON'T KNOW
	Hotel food safety control aspects			
	Receiving food only from approved suppliers			
	HACCP procedures followed at every step in the production process			
	Storage conditions followed of all food			
	Protection from contamination - away from chemicals, physical and biological contaminants			

4. There is a written Standard Operating Procedure for the hotel?

Yes No Don't know

5. Procedures of Food safety are hard for staff to understand?

Yes No Don't know

6. Staff have the needed equipment and/or tools to follow food safety procedures

Yes No Don't know

7. Management keep employees focused on food safety through training.

Yes No Don't know

8. How often does management train employees in the food safety management system

Once per year Twice per year One every three months

None Don't know

9. Are all food handlers trained on hotel HACCP program

Yes No Don't know

Section C. Adoption of Standards by Hotel Staff

1. Management frequently checks to ensure all employees are following established food safety rules.

Yes No Don't know

2. Staff follow personal hygiene procedures **Agree** **Don't** **know**

Disagree

- | | | | |
|--|--------------------------|--------------------------|--------------------------|
| • Right uniform is worn by staff | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • Hygienic procedures are followed by Staff when working with food | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • Staff wash hands using soap | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- | | | | |
|--|--------------------------|--------------------------|--------------------------|
| • Staff don't work with food when sick and report illnesses | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • No-touch taps and no-touch soap dispensers at Hand wash stations | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Maintain workplace clean | Yes | No | Don't know |
| • We maintain equipment and our work area clean using a disinfectant | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • We follow a cleaning schedule | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • All pest sightings are reported by Staff | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • We control vermin | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. To ensure food safety; | Yes | No | Don't know |
| • Stock is rotated on a first in first out basis | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • Food is kept & maintained at the right temperature | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • Temperature of fridges and freezers are checked regularly | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • Food is cooked to the right temperature | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. To prevent contamination, | Agree | Don't know | disagree |
| • Staff follow personal hygiene procedures | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • Raw fruit and vegetables washed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • Raw and cooked food kept separately | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • Separate equipment is used for raw and cooked food | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Section D. Impact of Safety System on Hotel Staff (Implementation)

Tick as appropriate, scale from 1 to 5, where

- 5 = never
- 4 = very rarely
- 3 = rarely
- 2 = sometimes
- 1 = always

6. Impact of food handling practices at the hotel

	1	2	3	4	5
Written standard operating procedures for cleaning and disinfecting equipment and facilities is followed					
All food production and service personnel follow proper hand washing practices					
Raw and cooked foods are stored separately					
Waste is properly disposed as required					
New employees are inducted receive all the training they need to perform their jobs according to food safety rules					

Section E: Food safety

7. Safe food handling

Tick as appropriate, scale from 1 to 5, where

- 5 = never
- 4 = very rarely
- 3 = rarely
- 2 = sometimes
- 1 = always

	1	2	3	4	5
Employees follow the food safety rules					
Employees encourage each other to follow food safety rules					
Management stresses food safety even when busy					
Management encourages employees to report all food safety issues.					
When errors arise from the food safety system, management acknowledges and makes changes					

Thank you. Your participation and your time is highly appreciated

APPENDIX 4: RESEARCHER'S OBSERVATION CHECK-LIST

Name of Hotel _____ Date _____ Time _____

Food Premises

I. The premises is designed, laid out and built to ensure good hygiene.

Yes No

II. All areas have adequate lighting in this premise.

Yes No

III. Food sections are clean and kept in good repair.

Yes No

IV. The premise has hot/cold running water at wash basins and hands drying materials.

Yes No

V. The premises hand washing and sanitary facilities are in good condition and adequate.

Yes No

VI. Food washing and hands washing have separate facilities.

Yes No

VII. There is adequate ventilation which is accessible for cleaning.

Yes No

VIII. The drainage is adequate and appropriate in all the places.

Yes No

IX. There is enough and adequate changing facilities.

Yes No

Equipment

XII. To ensure cleaning of surrounding areas equipment is moveable.

Yes No

XIII. Fittings, equipment and utensils are made of materials that can be kept clean.

Yes No

Kitchen areas

X. There is enough tools, equipment and facilities for cleaning purposes.

Yes No

XI. Floors, walls, ceiling and other surfaces maintained clean.

Yes No

Food Waste

XIV. Waste containers for food and other materials can be cleaned, disinfected and closed.

Yes No

XV. Waste disposal storage facility is designed so that they are pets proof and easily cleaned.

Yes No

XVI. Food wastes and other material is disposed off quickly from premises to avoid accumulation

Yes No

Water Supply

XVII. There is supply of adequate portable drinking water

Yes No

XVIII. Ice consumed in this premises is made from clean drinking water.

Yes No

Food Stuff

XXI. Contaminated or raw materials which are suspected of being contaminated are not used.

Yes No

XXII. Food preparation at all stages is protected from being contaminated.

Yes No

Personal Hygiene

XIX. Food handling staffs wear clean, suitable and appropriate protective clothing.

Yes No

XX. The staff handling food wash their hands after using the toilet.

Yes No

Training

XXIII. Food handlers are well trained in food hygiene and are closely supervised.

Yes No

Temperature Control

XXIV. Food is held at appropriate temperature before service.

Yes No

Other Comments

**APPENDIX 5: RESEARCHER'S INTERVIEW QUESTIONNAIRE -
MANAGERS**

I am a Post-Graduate student at Kenyatta University. I am carrying out a research on Food Safety Management in 5-star hotels in Nairobi County. This questionnaire is designed to gather information on the same. Kindly assist me by answering as accurately as possible. Any information provided will be treated as confidential and only for academic purposes.

Thank you.

Interviewee no _____ Date _____

1. Is Management is committed to serving safe food?
 - How?
 - Is there a team to oversee the system?
 - System in place aligned to HACCP standards?
2. Are all food handlers trained on hotel HACCP program?
3. How often does management get trained in the food safety management system
4. How often does management train employees in the food safety management system
5. Is an independent audit of the food safety system carried out?
 - How frequent?
 - Who does the audit?
6. Is independent health inspection carried out for the hotel?
 - Is there certification
 - How Frequent is the Inspection?

- 7. Does management involve employees to improve food safety system
- 8. How are the various standard food safety systems applied in this hotel to enhance food safety? (Probe)

Hotel food safety control aspects

.....

Food is supplied from reputable and certifies suppliers

.....

Periodic evaluation by DHP

.....

Storage practices

.....

- 9. In terms of compliance with various food safety systems, how are the following aspects enhance food safety? (Probe).

Personal hygiene procedure

.....

Environmental hygiene

.....

Food storage

.....

Contamination prevention

.....

10. How are the various standard food safety systems implemented in this hotel to enhance food safety? (Probe).

Standard procedures for cleaning and disinfecting utensils

.....

Waste disposal procedures

.....

Implementing food safety items in HACCP framework

.....

11. Describe food safety in this hotel in terms of:

Cases of food poisoning

.....

Complaints from customers

.....

Food handling procedures

.....

APPENDIX 6: RESEARCH PERMIT


**NATIONAL COMMISSION FOR SCIENCE,
TECHNOLOGY AND INNOVATION**

Telephone: +254-20-2213471
2241348, 3310971, 2219420
Fax: +254-20-318245, 318244
Email: dg@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

NACOSTI, Upper Kabini
Off Wanyaka Way
P.O. Box 20623-00100
NAIROBI-KENYA

Ref. No: **NACOSTI/P/18/33305/24794** Date: **2nd October, 2018**

Raphael Wainaina Oduol
Kenyatta University
P.O. Box 43844-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on *“Role of management systems on food hygiene practices in 5-star hotels in Nairobi, Kenya”* I am pleased to inform you that you have been authorized to undertake research in **Nairobi County** for the period ending **2nd October, 2019**.

You are advised to report to **the County Commissioner and the County Director of Education, Nairobi County** before embarking on the research project.

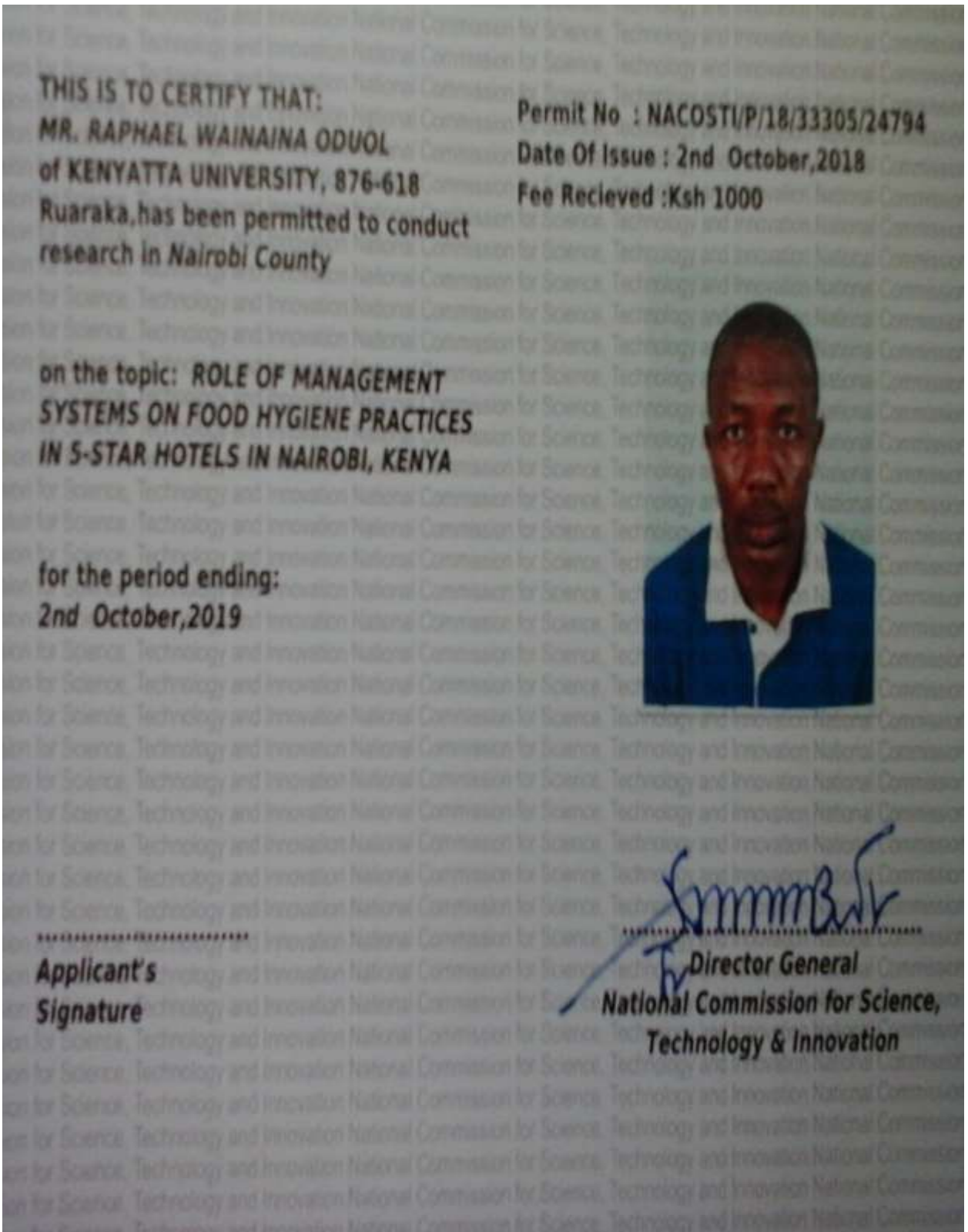
Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.


BONIFACE WANYAMA
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Nairobi County.

The County Director of Education
Nairobi County.



THIS IS TO CERTIFY THAT:
MR. RAPHAEL WAINAINA ODUOL
of KENYATTA UNIVERSITY, 876-618
Ruaraka, has been permitted to conduct
research in Nairobi County

Permit No : NACOSTI/P/18/33305/24794
Date Of Issue : 2nd October, 2018
Fee Recieved :Ksh 1000

on the topic: ROLE OF MANAGEMENT
SYSTEMS ON FOOD HYGIENE PRACTICES
IN 5-STAR HOTELS IN NAIROBI, KENYA

for the period ending:
2nd October, 2019



.....
Applicant's
Signature


.....
Director General
National Commission for Science,
Technology & Innovation



KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke

Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 020-8704150

Our Ref: T129/22504/12

DATE: 26th July, 2018

Director General,
National Commission for Science, Technology
and Innovation
P.O. Box 30623-00100
NAIROBI

Dear Sir/Madam,

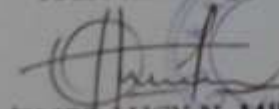
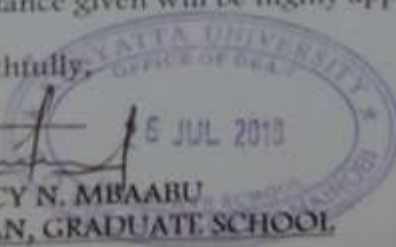
**RE: RESEARCH AUTHORIZATION FOR MR. RAPHAEL W. ODUOL – REG.
NO. T129/22504/12**

I write to introduce Mr. Raphael W. Oduol who is a Postgraduate Student of this University. He is registered for M.Sc. degree programme in the Department of Hospitality Management.

Mr. Oduol intends to conduct research for a M.Sc. thesis Proposal entitled, "Role of Management Systems on Food Hygiene Practices in 5-Star Hotels in Nairobi, Kenya."

Any assistance given will be highly appreciated.

Yours faithfully,



 MRS. LUCY N. MBAABU
 FOR: DEAN, GRADUATE SCHOOL



**KENYATTA UNIVERSITY
GRADUATE SCHOOL**

E-mail: dean_graduate@ku.ac.ke

Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 020-8704150

Internal Memo

FROM: Dean, Graduate School

DATE: 26th July, 2018

TO: Mr. Raphael W. Oduol
C/o Department of Hospitality
Management

REF: T129/22504/12

SUBJECT: APPROVAL OF RESEARCH PROPOSAL

=====

We acknowledge receipt of your Research Proposal after fulfilling recommendations raised by the Graduate School Board of 4th July, 2018.

You may now proceed with your Data collection, subject to clearance with the Director General, National Commission for Science, Technology & Innovation.

As you embark on your data collection, please note that you will be required to submit to Graduate School completed Supervision Tracking Forms per semester. The form has been developed to replace the Progress Report Forms. The Supervision Tracking Forms are available at the University's Website under Graduate School webpage downloads.

Thank you


HARRIET SABORE

FOR: DEAN, GRADUATE SCHOOL

CC: Chairman, Department of Hospitality Management

Supervisors:

1. Dr. Moses Miricho
C/o Department of Hospitality Management
Kenyatta University
2. Dr. Monica Wandolo
C/o Department of Hospitality Management
Kenyatta University