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ASSESSMENT OF FOOD HYGIENE KNOWLEDGE, ATTITUDE AND BEHAVIOR OF FOOD HANDLERS AND IMPLEMENTATION TREND OF FSMS (FOOD SAFETY MANAGEMENT SYSTEM) AT FOUR & FIVE STAR HOTELS IN ADDIS ABABA

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**BAHIR DAR UNIVERSITY
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SCHOOL OF RESEARCH AND POSTGRADUATE STUDIES
FACULTY OF CHEMICAL AND FOOD ENGINEERING**

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FOUR & FIVE STAR HOTELS IN ADDIS ABABA**

MSc. Thesis Research

By

Fikirte Mequanent

Program: Master of Science in Food Safety and Quality

Main Advisor: Tadele Andargie (Assi. prof.).

July 2022

Bahir Dar, Ethiopia



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IN ADDIS ABABA**

**MSc. THESIS RESEARCH
BY
FIKIRTE MEQUANENT**

**A thesis submitted in Partial Fulfillment of the Requirements for the Degree of
Master of Science in Food Engineering (specialization in Safety and Quality)**

Advisor: Tadele Andargie (Assi. prof.)

**Bahir Dar, Ethiopia
July-2022**

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Approval of Thesis for defense

I hereby certify that I have supervised, read, and evaluated this thesis title as **Assessment of Food Hygiene Knowledge, Attitude and Behavior of Food Handlers and Implementation Trend of FSMS at Four & Five Star Hotels in Addis Ababa**

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I hereby confirm that the changes required by the examiners have been carried out and incorporated in the final thesis.

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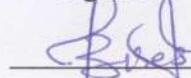
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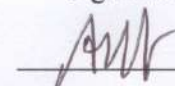
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Abbreviations

AAFMHACA: Addis Ababa Food, Medicine and Health Care Administration and Control Authority

CDC: Centers for Disease Control and Prevention

EPA: Environmental Protection Authority

FSMS: Food Safety Management System

FAO: Food and Agriculture Organization

HACCP: Hazard Analysis Critical Control Point

MoH: Ministry of Health

MoA: Ministry of Agriculture

MoI: Ministry of Industry

MoT: Ministry of Trade

MoE: Ministry of Education

MoCT: Minister of Culture and Tourism

NCC: National Codex Committee

QSAE: Quality and Standards Authority of Ethiopia

SPSS: Statistical Package for the Social Sciences

WHO: World Health Organization

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Abstract

Background

Food hygiene is all conditions and measures necessary to ensure the safety and suitability of food at all stages of the food chain. Major food safety incidents that occur throughout the food system include biological, chemical, or physical hazards. There are factors contributing for the occurrence of food safety incidents include contaminated raw materials, mishandling of food or raw materials in transportation, processing, preparation, storage and packaging.

Objectives

The main objective is to investigate food hygiene/safety knowledge, attitude and practice amongst food handlers' in four and five star-rated hotels in Addis Ababa and to determine the compliance of the selected hotels with food hygiene and food safety principles in reducing or eliminating hazards in their production and services.

Methods

Descriptive method of data analysis has been used to a food safety observation questionnaire/checklist to assess the extent food safety practices are followed in four and five star hotels in Addis Ababa. As complementary data, interview of regulatory bodies, hotel owners and managers has been included.

Result

Assessment of Food Hygiene Knowledge, Attitude and Behavior of Food Handlers and Implementation Trend of FSMS at Four & Five Star Hotels in Addis Ababa, has greatly noticed that inconsistency of Hygiene and Food Safety requirement compliance by food handlers and hotels. Lack of well-structured and defined government attention as a policy and regulation specific to the subject food safety and hygiene has been more aggravated the problem. Lack of streamlined surveillance audit by the authorized government organization resulted for inattention for food safety requirement implementation. It is about 86% of the assessed hotels has no assurance section and professional headcount for

sustainable compliance shows that the commitment and dedication of hotel managers and owner towards the subject food hygiene and food safety.

Individual competency and lack of induction and refresher training on food safety and hygiene has noticed as a difficulty in exercising food safety and food hygiene practices.

In fact COVID-19 pandemic is one that confronted the hospitality industry with an unprecedented challenge. This is also one factor for inconsistency of requirement implementation.

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CHAPTER ONE

1. Introduction

1.1 Background

Food safety is used as a scientific method/discipline describing handling, preparation, and storage of food in ways that prevent food-borne illness. The occurrence of two or more cases of a similar illness resulting from the ingestion of a common food is known as a food-borne disease outbreak (Encyclopedia, "Food safety"– news JSTOR (*May 2017*)).

This includes a number of routines that should be followed to avoid potential health hazards. In this way, food safety often overlaps with food defense to prevent harm to consumers. The tracks within this line of thought are safety between industry and the market and then between the market and the consumer. In considering industry to market practices, food safety considerations include the origins of food, food labeling, food hygiene, food additives and pesticide residues. In addition, policies on biotechnology and guidelines for the management of governmental import and export inspection and certification systems for foods also impact food safety. In considering market to consumer practices, the usual thought is that food ought to be safe in the market and the concern is safe delivery and preparation of the food for the consumer. (Encyclopedia, "Food safety"– news JSTOR (*May 2017*)).

Food hygiene is all conditions and measures necessary to ensure the safety and suitability of food at all stages of the food chain. Major food safety incidents that occur throughout the food system include biological, chemical, or physical hazards with the factors contribute for the occurrence of food safety incidents. These factors might be contaminated raw materials, mishandling while transportation, processing, preparation, storage, packaging. Inadequate maintenance of equipment or facilities, and addition of incorrect ingredient(s) also factors for the incident of food safety hazard.

Food can transmit pathogens which can result in the illness or death of the person or other animals. The main types of pathogens are bacteria, viruses, parasites, and fungus. Food can also serve as a growth and reproductive medium for pathogens. In developed countries there are intricate standards for food preparation, whereas in lesser developed

countries there are fewer standards and less enforcement of those standards. Even so, in the US, in 1999, 5,000 deaths per year were related to foodborne pathogens. Another main issue is simply the availability of adequate safe water, which is usually a critical item in the spreading of diseases. In theory, food poisoning is 100% preventable. However this cannot be achieved due to the number of persons involved in the supply chain, as well as the fact that pathogens can be introduced into foods no matter how many precautions are taken. (WHO Food Safety News on 19 May 2022)

Food contamination happens when foods are contaminated with another substance. It can happen in the process of production, transportation, packaging, storage, sales, and cooking process. Contamination can be physical, chemical, or biological.

Physical contamination

Physical contaminants (or ‘foreign bodies’) are objects such as hair, plant stalks or pieces of plastic and metal. When a foreign object enters food, it is a physical contaminant. If the foreign objects are bacteria, both a physical and biological contamination will occur. Common sources of physical contaminations are: hair, glass or metal, pests, jewelry, dirt, and fingernails. Physical contaminations can cause injury and choking to the consumers.

Chemical contamination

Chemical contamination happens when food is contaminated with a natural or artificial chemical substance. Common sources of chemical contamination can include: pesticides, herbicides, veterinary drugs, detergents, contamination from environmental sources (water, air or soil pollution), cross-contamination during food processing, migration from food packaging material. Chemical hazard can cause poisoning to the consumers.

Biological contamination

Bacterial contamination is the most common cause of food poisoning worldwide that happens when the food has been contaminated by substances produced by living creatures, such as humans, rodents, pests or microorganisms which includes bacterial contamination, viral contamination, or parasite contamination that is

transferred through saliva, pest droppings, blood or fecal matter. (Encyclopedia "Food safety" – news · newspapers · books · scholar · JSTOR (*May 2017*))

Globally, every year billions of people are at high risk and millions fall ill; many die as a result of consuming unsafe food (WHO, 2015). More than 200 known diseases have been transmitted through unsafe food (Mead et al., 1999). As a result, around 2.0 billion illnesses are associated with food borne diseases (WHO, 2015). Concerning low income countries, food born disease causes 2 million deaths. Also, it is related to high rate of hospitalizations and treatment cost (WHO, 2015; Barrabeig et al., 2010; WHO, 2007). In particular, the highest rate of morbidity and mortality rates are consistently reported in African. Poor food handling and sanitation practices, inadequate food safety laws, weak regulatory systems, lack of financial resources to invest on safety equipment and poor literacy status of food-handlers are some of the attributors augmenting the adverse consequences of food born disease (WHO. 2015; Barrabeig et al., 2010).

Food safety concerns have become important factors for consumers in determining food selection and consumption. Mishandling of food plays a significant role in the occurrence of foodborne illness. Improper food handling may be implicated in 97% of all foodborne illness associated with catering outlets (Howes, et al., 1996). Improper practices responsible for microbial foodborne illnesses have been well documented (Bryan, 1988) and typically involve cross-contamination of raw and cooked foodstuffs, inadequate cooking and storage at inappropriate temperatures. Cruickshank (1990) added that food handlers may also be asymptomatic carriers of food poisoning organisms. Prevention of foodborne illnesses is one of the primary responsibilities of the foodservice industry (Cushman, et al., 2001). To achieve that, hospitality operations in general and food service establishments in particular must comply with strict food legislation that requires them to have a food safety management system.

An adequate supply of safe, wholesome and health food is essential to the health and well-being of humans (WHO, 1979). However, at times, food itself can pose a health threat. The consumption of contaminated or unsafe foods may result in illness, also referred to as foodborne disease (WHO, 2004). Foodborne diseases remain a major public health problem across the globe. The problem is severe in developing countries due to

difficulties in securing optimal hygienic food handling practices. In developing countries, up to an estimated 70% of cases of diarrheal disease are associated with the consumption of contaminated food (WHO, 2000). Reliable statistics on food borne diseases are not available due to poor or non-existent reporting systems in most developing countries.

With the increase in urbanization, industrialization and tourism, mass catering establishments are becoming increasingly popular in both industrialized and developing countries. This dictates the need to ensure hygienic food handling and preparation practices in such public food establishments to safeguard the health and well-being of consumers. Because food prepared in large quantities is more liable to contamination, there is a greater potential for the occurrence of food borne disease outbreaks if basic sanitary practices are not maintained (Ethiop.J.Health Dev. 2007;21(1)). Reports of food borne disease outbreaks in various countries have resulted from unhygienic food handling and preparation practices within food establishments (Ethiop.J.Health Dev. 2007;21(1)). In countries where disease surveillance is well established, food borne diseases are well monitored.

There were about 737 outbreaks of food borne diseases with a total of 52,011 cases reported to the Centers for Disease Control and Prevention (CDC) and 33% of these outbreaks were related to food consumption in restaurants, cafeterias, and delicatessens (Salvato, 1992).

Like other developing countries, Ethiopia is affected by the increasing burden of food-borne diseases. Major food safety concerns are caused by physical, chemical, and microbiological contaminants. A summary report on out-patient visits of the Ministry of Health, released in 2014, indicates annual incidence of food-borne illnesses ranged from 3.4% to 9.3%, the median being 5.8% (Teshome et al., 2014).

In Ethiopia, there have been studies on sanitation and hygiene status in non-star hotels, bars, restaurants, cafes and hospitals (Feben, 2010; Endalkachew, 2014). However, to the best of our knowledge, no data on food hygiene and food safety related issues in star-rated hotels that hindered to take remedial action/support needed to improve food safety and implementation of associated regulatory and management practices. In hotels, food should be received, stored, prepared and served to consumers properly and in a safe way.

Therefore, the current study aims to evaluate the food hygiene knowledge and behavior of food handlers and also to evaluate the effectiveness of application of food safety management systems/HACCP in four and five star hotels in Addis Ababa. The research findings/recommendations will contribute to improve effective implementation of food safety management systems in the country, and will be an input to the regulatory bodies or policy makers and also opens an insight for further research.

1.2 Statement of Problem

Food with satisfactory hygienic standards is one of the essential conditions for promoting and preventing health. On the other hand food can also be a source of infection if the sanitary and hygienic rules are not implemented properly. For example poor personal hygiene of food handlers frequently contributes to outbreaks of food borne illness. Food borne illnesses are prevalent in Ethiopia and the loss of human life and suffering is enormous. Epidemiologic data related to food-borne diseases are inadequate in Ethiopia. But it can be evidenced that these are very common in the country because of many reasons including poverty, lack of awareness, poor water supply, poor personal hygiene and environmental sanitation, etc.

In Ethiopia, there have been studies on sanitation and hygiene status in non-star hotels, bars, restaurants, cafes and hospitals (Feben, 2010; Endalkachew, 2014). Despite the increasing number of food catering establishment in Addis Ababa, the sanitary condition of food catering establishment in star hotels is not studied.

There are gaps in Ethiopian food safety system implementation and enforcement, food-borne diseases surveillance, coordination of organizations involved in food safety management, and laboratory services for relevant food hazards. Lack of appropriate food safety assurance systems are problems that have become obstacles to Ethiopia's economic development and public health safety.

1.3 Objectives

1.3.1 General objective:

The general objective of this research work is to evaluate the food hygiene knowledge, attitude and behavior of food handlers and also to evaluate the effectiveness of application of food safety management systems/HACCP in four and five star hotels in Addis Ababa.

1.3.2 Specific objectives

- ✓ To investigate food hygiene/safety knowledge, attitude and practice amongst food handlers' in four and five star-rated hotels in Addis Ababa;
- ✓ To determine the compliance of the selected hotels with food hygiene and food safety principles in reducing or eliminating hazards in their production and services.

1.4 Significance of the study

Assessment on food hygiene and food safety related issues in star-rated hotels have not been conducted in Ethiopia in general and particularly in Addis Ababa City Administration (Ethiopia) that hindered to take remedial action/support needed to improve food safety and implementation of associated regulatory and management practices. The findings of this study can generate information that can help Addis Ababa City administration and other relevant stakeholders to understand the level of sanitary conditions and standard compliance in the star-rated hotels and help the regulatory efforts to improve sanitary conditions of food catering establishments. Also the finding of this study can be used as base line data for further study. The rating or grading of food catering establishments is also useful for environmental health inspectors to determine the inspection schedule as well as for enforcement action.

1.5 Scope of the study

The scope can cover the subject assessment on food hygiene and food safety on those four & five star hotels in Addis Ababa. The study accommodate the food hygiene and food safety starting from raw material supplier accreditation, receiving, preparation, cooking, personal hygiene, the sanitation of the environment where the food is being stored, prepared and served, as well as of the equipment being used and delivery that four

and five star hotels are exercising currently. Moreover, the assessment that assures and grants for government bodies the implementation of the required food safety and hygiene standard. They can indirectly assess the capability of the local supplier for hotels.

CHAPTER TWO

2. Literature review

2.1 Food safety in Ethiopia

Despite the considerable burden of food borne diseases on health and socio- economic development, food safety interventions have remained at the least priority in developing regions (WHO, 2015). According to various studies, poor knowledge and practice of hygiene and sanitation, lack of basic sanitary facilities/infrastructures in food service establishments, and negligence in safe food handling are major causes of poor sanitary conditions of food and drinking establishments (WHO. 2003; Kibret M. and Abera B. 2012; Kumie et al., 2006).

In Ethiopia, key stakeholders involved in food safety management include Ministry of Health, Ministry of Agriculture, Quality and Standards Authority of Ethiopia, Environmental Protection Authority, Ministry of Industry, Ministry of Trade, different Federal and Regional Governmental Bodies, Research Institutions, Ministry of Education, Food Manufacturers, Food distributors and Hotels. Even though, effective food safety systems are vital to maintain consumer confidence in the food system and to provide a sound regulatory foundation for domestic and international trade in food. There is no appropriate policy framework that guides food safety management. Initiating the establishment of National food safety Authority/policy, upgrading the capacity of existing public health laboratory, personnel, food-borne diseases surveillance, and legal and policy frame work are as such suggested to overcome these problems (Henok et al., 2013).

2.2 Good Hygienic Practices

Good hygienic Practices describe “all practices regarding the conditions and measures necessary to ensure the safety and suitability of food at all stages of the food chain”, which is an important process that eventually leads to the safety in the kitchen (FAO, 2012).

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

Food borne diseases are perhaps the most widespread health problem in the contemporary world and an important cause of reduced economic productivity (Mahami and Odonkor, 2012). The high prevalence of diarrheal diseases in many developing countries suggests major underlying food safety problems (WHO, 2007). Mishandling of food plays a significant role in the occurrence of food borne illnesses.

Hazard Analysis Critical Control Points (HACCP) has long been internationally recognized and accepted as the system for effective food safety management system (Panisello and Quantick, 2001). It is a systematic preventive approach to food safety for identifying potential contamination and subsequently evaluating that the process is in control of those points or steps of the agri-food chain critical to food safety (Kok, 2009). However, its success and effectiveness in preventive food-borne diseases and reducing food safety risks to an acceptable level depend on its correct implementation and application.

HACCP is an evaluation system that is developed to assess, implement and control the threats of contamination in food service industry. Its international acceptance has become the basis of discussion on food safety and prevention of chemical, biological and physical contaminants. It is a program that ensures the quality, safety and hygienic practices carried out in the foods and drinks served. HACCP is a system that has been around since the late 1960's. Studies on food safety have tended to focus on regulations and measures required to develop and enforce the food safety regulations, education and technical sophistication to be applied by food processors for HACCP to be accomplished (Corlett, 1998). This may suggest a need for a study to assess HACCP compliance by hotels if such food safety system is not available. The need to investigate the possibility of introducing a HACCP system, for hotels, aroused from the fact that a HACCP system must be developed by each sector and tailored to their individual products, processing and distribution conditions.

Thus unsafe food handling practices by food handlers and infected (carrier) food handlers are the primary source of infection and introduction of biological hazards to food. Food handlers' knowledge towards food safety is critical to handle food safely and to restrict

themselves in preparation of food when they are symptomatically ill or carrier state with the ultimate goal of protecting its customer (Paez and Ortiz,2011).

Considering the colossal negative effects of unsafe food, several forms of food hygiene and safety rules and regulations are being legislated both internationally and locally to guide food producers on safe production. But as noted by Knowles (2002), there exists a gap between legislative intentions and hotels “operational good practices which is not without its attendant negative implications for the provision of safe food to the customer”. This gap as discovered through research results can be attributed to managers perceptions and attitudes toward hygiene training, conditions in the workplace and time pressure (Worsfold and Griffith, 2003; Colman, Griffith and Botherill, 2000).

2.3 Food legislation/food safety management system in Ethiopia

The Federal Democratic Republic of Ethiopia issued its first proclamation on public health back in 1947 that contained the surveillance of foodstuff and beverages and also the sanitation of building and facilities. Recently two new proclamations on Trade Practice and Consumers’ Protection proclamation 685/2010 and Commercial Registration and Business license proclamation 686/2010 were announced with the aim to contribute towards achieving better results in food safety assurance (FAO, 2008).

In Ethiopia, the development of food industries and the establishment of government regulatory bodies have grown in parallel. United Nations Industrial Development Organization (UNIDO) is making efforts to implement ISO 9000 and the HACCP system in Ethiopia based on the success it has achieved in the developing world, namely, Asia, Eastern Europe, Latin America and some parts of Africa (Belete, 2010).

The National Codex Committee (NCC) was established under the auspices of the Quality and Standards Authority of Ethiopia (QSAE) in 2003. The member organizations are: Addis Ababa University, Ministries of Health, Agriculture, Trade and Industry, Education, Ethiopian Health and Nutrition Research Institute, Ethiopian Institute of Agricultural Research, Chemical Society of Ethiopia, ELFORA Agro industry, Ethiopian Manufacturing Industries Association, Ethiopian Consumers Association and Ethiopian Chamber of Commerce and QSAE (NCC, 2010).The main activities are adoption of recommend Codex standards as Ethiopian standards, represent the country’s interest on

selected international Codex meetings, identify priority areas on food safety and develop fundable projects and conduct national awareness program on food safety and codex standards (Yalemtehay, 2010).

In Ethiopia, key stakeholders involved in food safety management include Ministry of Health (MoH), Ministry of Agriculture (MoA), Quality and Standards Authority of Ethiopia (QSAE), Environmental Protection Authority(EPA), Ministry of Industry (MoI), Ministry of Trade (MoT), different Federal and Regional Governmental Bodies, Research Institutions, Ministry of Education (MoE), Food Manufacturers, Food distributors and Hotels (FAO and WHO, 2005).

Ethiopian Food, Medicines and Health Care Administration and Control Authority were established in accordance with Food, Medicine and Health Care Administration and Control Regulation No 189/ 2002. According to the new proclamation (“16th Year No.51 Addis Ababa 23rd August 2010, Clause Number 5), the Authority is responsible for assuring safety and quality of food, safety, efficacy, quality and proper use of medicines, competence and ethical practice of health professionals, competence of health and health related institution and services. The Quality and Standards Authority of Ethiopia is the National Standards Body of Ethiopia established in 1970. The Authority is mandated to ensure food safety through certification, inspection and testing. The Authority has accredited or internationally recognized on:

- (i) System certification based on ISO/IEC 17021 Quality Management System on ten scopes, two of which are: Agriculture and fishery, and Food and beverage.
- (ii) Microbiological testing based on ISO/IEC 17025 with four parameters namely; yeasts and molds, total coliforms, fecal coliforms, and E. coli.

2.4 State of Food Safety in Hotel Sector

Since all levels of food production are based on human interference, the level of information of employees’ is crucial in establishing standards in hotel food security/hygiene (Wolf, 2002; O’Fallon and Rutherford, 2009). These standards consists of hygienic production and storage of foods by kitchen employees, delivering products with same standards to customer by service staff for healthy and quality food

consumption which all necessitate good level of knowledge and equipment (Ozkaya et al., 2008).

In addition to being a tool for addressing food-borne health threats, Steffen et al. (2012) state that adoption of the HACCP system presents a number of benefits to the hospitality sector such as providing safeguards against hygiene disease outbreaks and arising legal suits. A study by Habeeb et al (2018) to assess the compliance with HACCP system in standard hotels in Ilorinmetropolis at Kwara State in Nigeria established that the concept of HACCP was not understood and that this could be impacting on the general food hygiene standards and food-handling practices of personnel. As a result, the researchers recommended the need to implement HACCP system to prevent food poisoning outbreaks and suggested that hotels could easily adapt the strategy only if law enforcers could put strict monitoring in place. Management must also provide required infrastructure for successful implementation of HACCP system inhospitality sector. In the same vein, Christos et al (2009) observes that factors such as attributes of a company and human are critical in executing a successful HACCP system.

Hotels, as an important part of the tourism industry, are one of the most common food production places. Hence, food safety, hygiene, and sanitation are the most critical issues need to be considered by hotel management. If the importance that required is not given to those issues during the preparation and service of the food, it might cause to the health threat for both personnel and customers (Baser et al., 2017). Bolton et al. (2008) stated that the food preparation personnel, and also customers may seriously be affected by the improper hygienic conditions in the hotel kitchens.

Food hygiene/safety awareness in our country is a basic problem as there is no well-designed curriculum and poor perception of food hygiene and safety from the society also contribute for inconsistent implementation of basic food hygiene/safety principles in the sector. The very good practice food hygiene in our culture is we cook food very well until it lost all nutrients than washing hands. However, after COVID-19, all the personal hygiene practice has totally changed in the society in a hard way as a protection mechanism. There are no structured and mandatory mechanisms that help to change the poor hygiene/safety practice. It needs to be included in the education curriculum rather

than one chapter in a subject to bring a culture change. Medias and respective health and food sector organizations also has a poor slot and attention to promote and create awareness on the hygiene. However, there are NGOs that promote and support for enhancement of hygiene practice.

In Kenya, there is a study in Food Hygiene Knowledge, Attitudes and Practices amongst food handlers in selected hotels and restaurants in Thika Town, Kenya. From this, developing nations are experiencing prevailing pitiable food hygiene practices, poor sanitation practices, weak regulatory bodies and systems, inadequate food related safety laws, inadequate financial resources aimed at safer food equipment, inadequate skills and education awareness among food handlers (Githiri, Kimiywe & Okemo, 2013).

The results illustrated that most of the food handlers had positive attitudes and practiced good food hygiene. However, a significant number of food handlers' unhygienic food hygiene practices in certain aspects where 27.5 % and 26.9 % of them reported to handle food when they have a cold and sick with diarrhea respectively. These practices increase the risk of transmitting food borne pathogens, such as E. coli and non-typhoidal Salmonella. (Githiri, Kimiywe & Okemo, 2013).

As a result, public health authorities and local governments ought to ensure that food handlers in food establishments follow the recommended food hygiene guidelines. In addition, the authorities should also do thorough checks to ensure that all food handlers hold valid medical certificates. Restaurant and hotel managers should ensure that all food handlers are free from illness and those ill should not be allowed to handle food. Similar studies need to be carried out among food handlers operating in the many fast food restaurants and food kiosks around the country.

CHAPTER THREE

3 Research Methodology

3.1 Description of Study Area

The study has been conducted in Addis Ababa, the capital of Ethiopia. Administratively, the City is having three layers of government (Federal government, Addis Ababa city administration and Sub-city government. The total area of the city is about 527 km² and the total human population was estimated to be 3,273,000 (CSA, 2013).

According to the Addis Ababa Food, Medicine and Health Care Administration and Control Authority AAFMHACA (2017) report, there are 1141 licensed food establishments, employing 4565 food handlers. Of the total licensed food establishments, 95 (8%) are large (hotels with one or more stars) and the remaining 1046 (92%) are small food establishments which include unranked (non-star hotels, bars, restaurants, cafes etc). There are 19 four-star and 9- five star hotels in Addis Ababa (Ethiopian Ministry of Culture and Tourism, 2021).

3.2 Methods of Data Collection

Descriptive method of data analysis has been used to a food safety observation questionnaire/checklist to assess the extent of food safety practices are followed in four and five star hotels in Addis Ababa, including receiving, storing, preparation, cooking, holding and serving processes. In addition, data has been collected and analyzed about hotel food handlers' demographics, knowledge and practices on food safety/hygiene as well as kitchen sanitation.

As complementary data, interview of regulatory bodies, hotel owners and managers has been included with a separate checklist. So, that four and five-stared hotels that are found in Addis Ababa were investigated for their food safety management systems for this thesis work.

3.3 Ethical consideration

Ethical approval and clearance letter has been obtained from Bahir Dar University. Verbal consent has held from establishment owners/managers and food handlers. Confidentiality and privacy of respondents has ensured throughout the research process.

The study design never harms those taking part and it does not include any identifying information like name, or address of respondents. It was well informed about the research that the study is only for the purpose of academic and institutional research and not for any other business or illegal activities.

3.4 Sample size and sampling method

The sampling has been taken in selecting the sample of four and five star hotels in random bases, and managers in charge of food safety and food handlers, regulatory bodies. The study has undertaken at 7 four-star and 7- five star hotels in Addis Ababa from the total of net 28 Hotels. The study population/respondents also have included regulatory body interviews.

Data has obtained by administering pretested semi-structured questionnaire to kitchen employees comprising the cooks, chefs and their assistants in the hotels.

3.5 Statistical analysis

A statistical tool, SPSS, version 20 has been used to analyze the survey data using descriptive analysis such as frequencies and percentages and presented using tables, bar and pie charts.

CHAPTER FOUR

4. Result and Discussion

4.1 Quantitative data analysis result and discussions

Sample hotels are selected in random bases. However, the very challenging scenario is to have acceptance of the request for interview and visit of the entire process by hotels administrations, as they never have been exposed for such kind of case study except regulatory body auditors when they are inspecting for certification. The intention is, the study may consume the data for social, governmental and economical purpose.

Since there are twenty eight (28) four and five star hotel in Addis Ababa and out of that nine of it is five star and 19 of the rest is four star hotels. Total sample conducted is about 50%, and 35.6% of sample sized were not conducted due to time constraint and the sample size already met 50%. However, 14.3 % (4 hotels) of the sample was not found volunteer to give any information. The below table can show the detail of hotel respondent:

Table 1: Collected Data Summary

Collected Data Summary						
Total Number of Hotels	Five Star Hotels	Four Star Hotels	Visit and Interview	Only Questioner	Not Volunteer	Not Conducted
28	9	19	7	7	4	10

From the respondent four five star and two four star hotels are franchised that are managed jointly with brand of hotel owner of foreigner which has a little difference in compliance of hygiene rules as they are strong in financial to fund cost of all sanitary facility to resist COVID-19 pandemic. And only four hotels have designated quality assurance section that manage the overall food hygiene and food safety which has a better compliance than those of others.

Table 2: Quality Assurance Structure of Franchised Hotels

Total of 5 & 4 Star Hotels	Conducted			
	Total	Non-Franchised	Franchised	
			Total	Designated Quality Assurance
28	14	8	6	4
Rated by % 100%	50%	29%	21%	14.3%

Demographic analysis of Respondent:

Most of the respondents are male aged above 40 and related work experience of hotel industry. In addition, most of them are married with dominant education background of diploma level. However, on implementation of food hygiene and food safety, they lack detail knowledge. Relatively, those who are female respondent have a better competency as may be they are close for food preparation and cooking since childhood. In general, the respondent knowledge and commitment is not satisfactory.

Table 3: Demographic Analysis

Category	Range	Frequency	Percent (%)
Sex	Female	4	22.2
	Male	14	77.8
Age	30-40	9	50
	40-50	8	44.4
	50-60	1	5.6
Marital Status	Married	14	77.8
	Not Married	4	22.2
Education level	Diploma	6	33.3
	Degree	7	38.9
	Masters	5	27.8
Qualification	Related	18	100
Experience	10-20	16	88.9
	20-30	2	11.1

4.2 Food safety knowledge and practice quantitative analysis

As indicated in the summary table 4, the impact of inconsistent food safety practice implementation is not well known. Specially, knowledge about microorganism presence even in the refrigerator has got a lower value as compared to the other. Detail knowledge also about the different causes of food poisoning/food borne disease is not clearly understood by the correspondents. Simply hand washing is recognized as ultimate hygiene practice that brings food safety. That is why relatively improved value rated on number of hand washing during food preparation.

It would be very better to develop the food safety knowledge, if there is a defined curriculum of food safety from lower level education to the high schools. Indirectly, lack of government regulatory enforcement on food safety prerequisite programs like trained and certified employee, proper sanitary facility construction, accessibility and cleanable of equipment and facility are also contributing factors.

Table 4: Food Safety Knowledge and Practice Analysis

Food Safety Knowledge and Practice			
List of Questions	Agree	Disagree	Not Always
Knowledge about food poisoning/food borne disease	43%	0%	57%
Knowledge of microorganisms found in refrigerated foods	21%	50%	29%
Number of times hands washed during food preparation per the minimum step	50%	36%	14%

4.2.1 Food hygiene practice among food handlers

As indicated in table 4, the value, 1 represents for Agree, 2 represents for Disagree and 3 represents for not always. Individual list of questions has summarized as the average cumulative of total respondent hotels, finally the average total of all list of questions under food hygiene practice rated as 1.82 which is close to a value 2 that the implementation is approximately not applied. This is majorly because of lack knowledge,

awareness, supervision, resource and accountability. In addition, absence of accountable section like quality control or assurance that follow up the deviation or gaps from the management, employee, system, facility and other aspect.

Table 5: Assessment of Food Hygiene Knowledge, Attitude and Practice Analysis

Descriptive Statistics of Food hygiene Practice	
List of Questions	Average Value
Possession of medical certificate:	2.29
Does the food handler take shower daily base before job?	2.43
Does the food handler are well aware of no smoking and chewing gum?	1.00
Cleanness of outer garments?	1.71
Does the food handlers hair covered while working in food service establishments during visit?	2.29
Does the food handler's fingernail short trimmed and clean?	1.57
Does food handler wear any jewelry or ring on hand at time of visit?	1.57
Does the food handler wash cutting surfaces/knife/with soap/bleach/after using it for cutting raw meat or chicken?	2.00
Does the food handler wash his/her hands with soap and water before working with food?	2.00
Does the food handler wash his/her hands with soap and water after visiting a latrine?	1.00
Does the food handler not drink or eat food while serving or preparing food?	2.00
Does the food handler kept ready-to-eat foods in a clean container and covered properly?	1.57
Does the food handler use a separate clean utensil for each food item?	1.86
Does the food handler store raw food item in an area separate from cooked food?	1.57
Does the food handler use glove while handling food and any policy of glove usage?	2.57
Does the food handler use first aid when there is any injury, and is there accessible?	1.86
Does the food handler report any sickness to the supervisor?	1.71
Total Average	1.82

From this table, employee medical checkup certificate is not well implemented. Food handler are exercising taking shower after job than before job which will have cross contamination to the food they prepare. As food safety principle hair shall be well covered by net, however the above result shows poor implementation and the very bad

part is not enough delivery of hair net by the hotels, equipment and hand washing is mostly exercised by washing only by water and some detergent and no disinfection/sanitizer. As hand hygiene is critical for food safety, both glove supply by the hotels and proper utilization by the food handlers is a problem as the summarized result shows.

4.2.2 General Descriptive analysis

In this summarized analysis which is indicated in table 5, the average calculation of each category has been derived. Food safety knowledge and practices and Food hygiene practice among food handlers has a list performance nonetheless, it has a big impact especially on foodborne illness. Most of the respondent and visited hotels have majorly a gap on knowledge about foodborne illness major cases and its behavior. The below listed gaps are commonly observed:

- Inconsistent supply of sanitary materials and inadequate of sanitary rooms (soap, water, towel...)
- Lack employee training, awareness and briefing
- Insufficient supply of glove and hairnet
- Improper uniform cleaning and ironing
- Inconsistent medical checkup performance
- Inconsistent supply of standard uniform and safety shoes
- Lack of procedures on how to implement, even the available one is not be on the majority of the employee language type.

Most of the rating about working environmental characteristics/good manufacturing practice (GMP) has a better performance as it is the image the hotel. However, one major gap observed is modified kitchen and slippery floor which contradict to the process layout that can cause cross contamination.

In evaluation of receiving and storage of food items practices, the major gap observed is that local supplier mostly not maintained especially the cold foods expected to come on the specified temperature is very difficult. FIFO (First-in First-out) that using food items as per the date entrance and shelf life time is a challenge that individuals are not always exercised. In

temperature measuring instrument, almost all has no calibration standard that means most of the cooking, cooling machines has no checkup on its capability.

Table 6: Descriptive Summary

Evaluation Criteria	Number	Mean	Implementation Percentage (%)
Food safety knowledge and practices	14	2.0357	0
Food hygiene practice among food handlers	14	1.7391	26
Evaluation of receiving and storing practices	14	1.3095	65
Evaluation storing practices	14	1.5952	80
Evaluation of cold storing practices	14	1.3175	66
Evaluation of preparation and cooking practices	14	1.489	74.50
Evaluation of holding and serving practices	14	1.6786	84
Working environmental characteristics/GMP	14	1.7143	85.50
Average Total Implementation			60%

As 60% average rating is indicating that the level of compliance that respective assessed hotels to food hygiene and food safety principles to prevent food safety hazards in their production and service delivery.

4.3 Qualitative data summary and discussion

4.3.1 Exclusive interview summary

Minister of Culture and Tourism is the authorized organization that award hotel stars on the basics of having certification on hygiene and environmental sanitation competence and Health certificate of from minister health office. Regrade of hotels will conduct in every three years as a procedure however; implementation assurance needs further investigation by respective government body. There is Ethiopian standard criterion established on 2014 as hotel rating requirement and classification that has been stated on

the general requirement to be eligible for grading, premises shall first have satisfied all statutory regulation, requirements for health, safety and security fire, environmental services requirements for waste management and have certified documentary evidence of compliance. The entire list of the criteria does not have any stated concern of food safety and hygiene with the only granting the certification of health office and Addis Ababa Food, Medicine and Health Care Administration and Control Authority (**AAFMHACA**).

The criteria that has been developed for the hygiene and environmental sanitation certification by Addis Ababa Food, Medicine and Health Care Administration and Control Authority (**AAFMHACA**) can address all the concern of hygiene and food safety except missing staff induction and refresher training of food hygiene and food safety. The criteria still has not been accredited by Ethiopian standard as like that of hotel rating requirement however, the process of standardizing has started with respective stakeholders and under process. The inspection certification grants for one year valid period. It is intended that surveillance audit will be conducted in the middle of the year by same organization of different section of the certifying section however, there is no controlling system and defined frequency that assure the performance of surveillance audit. This can affect the consistent implementation of hygiene and food safety as the probability of sudden audit is almost in rare frequency that makes them reluctant on hygiene and food safety.

Considering that the COVID-19 pandemic has confronted the hospitality industry with an unprecedented challenge. Precaution actions like community lockdowns, social distancing, stay-at-home orders, travel and mobility restrictions have resulted in temporary closure of many hospitality businesses and significantly decreased the demand for businesses that were allowed to continue to operate. In addition, all hotels are required to meet a COVID-19 protocol such as visible sanitizing efforts (hand sanitizers at the entry, staff wearing masks and gloves), implementing social distancing, limiting the number of customers served, more rigorous and frequent cleaning of high-touch surfaces in common areas, and employee training of health and safety protocols. All this protocols has its own impact in terms of cost and management as markup price on the customer and limited

number of access has impact on the income. Therefore, this is also one factor for inconsistency of requirement implementation.

CHAPTER FIVE

5. Conclusion and Recommendation

Assessment of Food Hygiene Knowledge, Attitude and Behavior of Food Handlers and Implementation Trend of FSMS at Four & Five Star Hotels in Addis Ababa, has greatly noticed that inconsistency of Hygiene and Food Safety requirement implementation.

Mainly, lack of well-structured and defined government attention as a policy and regulation specific to the subject food safety and hygiene has been more aggravated the problem. Still there is no approved standard of accreditation criteria for hygiene and food safety for any hotels and restaurants at national level. Rather there is one booklet which has been published in 1966 on hygiene inspection that the inspection government using as a reference. However, hygiene and sanitation checklist has currently developed by a group of assigned experts at Addis Ababa Food, Medicine and Health Care Administration and Control Authority (**AAFMHACA**) at a section level. Until finalization of this research, there is no approved standard checklist at government level that can evaluate hotels food safety and hygiene. However, as information it is under preparation with respective stakeholder of the business organization in coordination with Ethiopian standard agency (ESA).

Secondly, once the certification granted, there is no streamlined surveillance audit by the authorized government organization due to different reasons. This allows the hotels to be inattention for requirement implementation.

Thirdly, since 86% of the assessed hotels has no assurance section and professional headcount for sustainable compliance shows that the commitment and dedication of hotel managers and owner towards the subject food hygiene and food safety.

Fourthly, individual competency and lack of induction and refresher training on food safety and hygiene has noticed as a difficulty in exercising food safety and food hygiene practices.

In fact COVID-19 pandemic is one has confronted the hospitality industry with an unprecedented challenge. This is also one factor for inconsistency of requirement implementation as the precautions like community lockdowns, social distancing, stay-at-

home orders, travel and mobility restrictions have resulted in temporary closure of many hospitality businesses and significantly decreased the demand for businesses that were allowed to continue to operate.

As general recommendations, government shall develop food law/legislation that can govern the sector. This can enforce the compliance of requirements in the industry. In addition, standard hotel and/or restaurant food hygiene and food safety criteria considering social and economic aspects of the industry shall be developed. The Authorized, government organization shall also design a structured surveillance audit by the industry professionals and need to enforce the compliance implementation. The government shall oblige respective hotel owners to have quality assurance section and professional for sustainable implementation of hygiene and food safety and to maintain continuous improvement.

Respective hotel owners and managers shall have structured and organized food hygiene and food safety training with valid certification card. For this, dedicate professional shall allotted that fully work on all aspect of training to bring attitude change.

Minster of Education shall also develop a curriculum from the lower grade up to university as a common course to bring culture and attitude change on the society. And also shall encourage the private sectors training centers on the subject in coordination with respective minister's organization for the enforcement of food sectors to apply and implement the program.

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7. Appendices

Questionnaire

Food hygiene and food safety in four and five star hotels in Addis Ababa, Ethiopia

Questionnaire

1. Demographic information of respondents:

Gender ___ F ___ Age _____ education level _____
 Professional qualification _____ Martial status _____
 work experience _____

2. Food safety knowledge and practices:	1=Agree	2=Disagree	3=Not Always
Food safety training:			
Knowledge about food poisoning/food borne disease:			
Knowledge of microorganisms found refrigerated foods:			
Number of times hands washed during food preparation per the minimum step:			
Twice ___ Thrice _____ When you touch something _____			
Possession of medical certificate: Yes _____ No _____			
3. Food hygiene practice among food handlers:			
Does the food handler wear outer garments/gown during visit?			
Does the food handler take shower daily base before job?			
Does the food handler are well aware of no smoking and chewing gum?			
Yes No			
Cleanness of outer garments?			
Does the food handlers hair covered while working in food service establishments during visit?			
Does the food handler's fingernail short trimmed and clean?			
Does food handler wear any jewelry or ring on hand at time of visit?			
Does food handler clean and sanitize work surfaces after each task today?			
Does food handler use soap/detergent for washing dishes?			
Does the food handler use hot water for washing dishes?			
Does the food handler wash cutting surfaces/knife/with soap/bleach/after using it for cutting raw meat or chicken?			
Does the food handler wash his/her hands with soap and water before working with food?			
Does the food handler wash his/her hands with soap and water after visiting a latrine?			

Does the food handler drink or eat food while serving or preparing food?			
Does the food handler kept ready-to-eat foods in a clean container and covered properly?			
Does the food handler stored food utensils in well-arranged manner in shelf or cupboard?			
Does the food utensils are free of dust particles, finger paint and other marks?			
Does the food handler use a separate clean utensil for each food item?			
Does the food handler store raw food item in an area separate from cooked food?			
Does the food handler use glove while handling food and any policy of glove usage?			
Does the food handler use first aid when there is any injury, and is there accessible?			
Does the food handler report any sickness to the supervisor?			
Does the food handler conduct scheduled medical examination of transmittable disease?			
Does the food handler are conduct induction and /or refresher hygiene/food safety training?			

4. Working environmental characteristics/GMP: Repair conditions of premises, availability of water supply, toilet facility, liquid and solid waste management, dish washing facility			
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5. Evaluation of receiving and storing practices in the hotels

Three-point Likert-type scale (Available = 2, somewhat available = 1 and not available = 0)

Receiving	Actual score/hotels	
1. The receiving area is cleaned and free of trash, insects and rodents.		
2. The receiving equipment are available in a good condition.		
3. Food is rejected if received at unsafe temperatures.		
4. Frozen / refrigerated food is stored immediately.		
5. Food is not accepted in badly, damaged, soiled, and infested condition.		

6. Food labels & dates are checked and controlled in receiving.			
7. Chilled and frozen foods are received in proper temperature.			
8. The delivery vehicles are cleaned, and in good condition.			
9. The raw material is delivered from internally accredited supplier			
10. The supplier is audited in scheduled based and pass the requirement			
11. The product delivered with the required approved specification			
12. Rejection proceeded with the procedure as to prevent reoccurrence			

6. Evaluation of receiving and storing practices in the hotels

Storing Dry store	Actual score/hotels		
13. Dry goods are stored in healthy airtight containers / sealed packets / no cartons			
14. Dried food items are stored at least 6 inches away from walls and above the floors			
15. Dry storage is clean, organized and shelves not rusty.			
16. Temperature / ventilation of dry storage is adequate.			
17. The dry store is clean, well-lighted and protected from insects and rodents.			
18. All products are labeled with name and date (expiry/delivery)			
19. Raw material arranged and used on FIFO (first in first out) basis.			
20. Raw materials are stacked properly (heavy cartons, glass jars stored on lower shelves)			
21. Chemicals are stored in separate room			

7. Evaluation of receiving and storing practices in the hotels

Cold store (refrigerators and freezers)	Actual score/hotels		
22. Proper temperatures are maintained (4°C or below for chiller and -18°C for freezers).			

23. General cleaning (walls / floors / doors / shelves / light fitting)			
24. Cooked foods are stored above or separately from raw foods.			
25. Food is stored away from floor and placed in clean containers.			
26. Cold storage room is not over-loaded with food products.			
27. Calibrated thermometer is used for checking temperature.			
28. Food from opened cans is decanted into healthy containers and labeled			
29. Products with strong odors are kept covered.			
30. Frozen foods are kept tightly wrapped or packed to avoid freezing burns.			

8. Evaluation of preparation and cooking practices in the hotels

Food preparation and cooking	Actual score/hotels		
31. The preparation areas are always clean, well lighted, well ventilated and free from insects and rodents.			
32. Preparation and cooking equipment and tools are available in good condition.			
33. Available color code of cutting boards and knives for raw & cooked items			
34. Cutting boards, meat blocks and surfaces cleaned, free from splits and sanitized.			
35. Food is defrosted under temperature controlled condition			
36. Thawed products are used immediately			

and not refrozen			
37. Vegetables are being properly washed and sanitized in separate sink			
38. Prepared foods are always covered.			
39. Documented cooking methods available			
40. Minimum cooking core temperatures are checked (75°C – 167°F)			
41. Frying oil/fat is changed immediately when there is color change or scum formation.			
42. Cooked food is not left at room temperature for more than 2 hours.			
43. All uncooked salads, fresh fruits & vegetables etc. are freshly prepared to the extent possible.			

9. Evaluation of holding and serving practices in the hotels

Food holding and serving	Actual score/hotels		
44. Hot holding units are being pre-heated prior to food being placed in them.			
45. All units are satisfactorily being pre-chilled before food is decanted for holding/display.			
46. Food display is presentable, well arranged and attractive.			
47. Food in hot/cold holding units is adequately protected against contamination risks			
48. Suitable serving utensils are provided.			

49. Hot foods are served hot and cold foods are served cold.			
50. Products displayed are labeled and name of the product are written clearly on the label			
51. Staff of service wear clean uniform and follows good personal hygiene habits.			
52. Personal hygiene messages displayed on prominent places.			
53. Table wares are available and in good condition.			
Other			
Is there a dedicate quality assurance section			
Is the Hotel a joint venture if yes, with which brand of hotel			