ASSESSING COMPLIANCE WITH FOOD HYGIENE REQUIREMENTS AMONG URBAN AND SUB-URBAN CLASSIFIED HOTELS IN BAUCHI STATE, NIGERIA

BY

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FEBRUARY 2011
DECLARATION

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

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To my precious kids Oluwafunmilayo, Ayomikun, Titilayomi, Oluwabusayomi and my dear husband Prof. Ayodele Adebitan.
ACKNOWLEDGMENTS

The researcher wishes to, first and foremost appreciate God the giver of life for grace, help, resources, wisdom, and health to achieve and to excel. To Him alone be glory and honor, power and majesty forever and ever, Amen.

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<tr>
<td>ANOVA</td>
<td>Analysis Of Variance</td>
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<tr>
<td>BASEPA</td>
<td>Bauchi State Environmental Protection Agency</td>
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<tr>
<td>EHOs</td>
<td>Environmental Health Officers</td>
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<tr>
<td>HACCP</td>
<td>Hazard Analysis and Critical Control Point</td>
</tr>
<tr>
<td>NBTE</td>
<td>National Board for Technical Education</td>
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<td>NEHPR</td>
<td>National Environmental Health Practice Regulations</td>
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<td>NTDC</td>
<td>Nigerian Tourism Development Corporation</td>
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<td>WHO</td>
<td>World Health Organization</td>
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<td>F &amp; B</td>
<td>Food and Beverage</td>
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ABSTRACT

The hospitality industry being allied with public health through the provision of food and drinks is guided by a number of food safety regulations among which is the Food Safety Act (1990) with the aim of safeguarding consumer health. Studies show however that despite the existence of these regulations and the powers conferred on relevant regulatory bodies to enforce compliance, food hygiene infractions exist amongst hotel operators with all its attendant negative implications. The study aimed at establishing levels of hotels’ compliance with food hygiene regulations as well as examining the level of commitment of regulatory agencies in maintaining standards of food hygiene and sanitation in urban and sub-urban classified hotels in Bauchi metropolis through enforcement and supervision. The objectives were based on establishing the level of awareness of the sanitation laws and regulations in Bauchi state by the hotel operators, to determine the level of compliance of hotels to sanitary laws, and find out if regulatory agencies carry out their statutory role of enforcing compliance to sanitation standards effectively. The study was limited to the urban and sub-urban classified hotels in Bauchi metropolis. The diagnostic survey design was adopted and a census population was used for a reliable result. Structured questionnaires were used to elicit information from the sixty-six respondents drawn from the hotels and regulatory agencies strata of the population. Observation checklist was also used to assess premises’ sanitary conditions of the hotels. The quantitative data collected was edited, coded and organized into appropriate themes. Data were analyzed using Statistical Package for Social Science (SPSS). Data was described using measures of central dispersion and tendency, frequency distribution tables and percentages. The one-way ANOVA was used to test for differences among the means of, and to analyze the total compliance scores of the eight hotels used for the study as regards all the 24 conditions of hygiene and sanitation that the regulatory agencies had scored them, based on a Likert scale with 5 points (5-Very Good, 4-Good, 3-Average, 2-Poor, and 1-Very Poor). A score between 24 and 56 implied Low Compliance, a score between 57 and 89 implied average compliance and a score between 90 and 120 implied high compliance. Chi-square was used to establish relationship between dependent and independent variables. All the significant tests for the hypotheses were at 95% confidence level (p< 0.05). 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 were below the average scores of between 57 and 89, and that there was no relationship between enforcement and compliance with sanitation standards in Bauchi. An exploratory analysis of other factors that were responsible for hotels’ good practices including compliance with regulations revealed that there is a direct relationship between professional qualification of hotels’ units’ heads and the hotels good practices. The study recommended an inclusion of and an emphasis on the regulations that guide hotel operations in Bauchi in hospitality courses curricula and a mandatory course on food hygiene and sanitation for prospective hotel entrepreneurs as a prerequisite for obtaining license for all food businesses in Bauchi.
INTRODUCTION

1.1 BACKGROUND TO THE STUDY

Hotel has been defined by the ‘Your Dictionary.com’ (2008) as a commercial establishment providing lodging and, usually, meals and other services for the public, especially for travelers. The food and beverage section of the hotel is concerned majorly with the purchase, storage, processing and service of food and drinks to customers at a price with the aim of making a profit while satisfying the customer. Since health and safety is a global issue of concern, and in order to safeguard customers’ health against the risk of food poisoning arising from unhygienic conditions of preparation, especially at public eating places like hotels and restaurants, certain health and safety laws are put in place by governments to regulate hotel and restaurant business operations (WHO, 2007).

The purpose of the law is to regulate human activities (Schmalleger, 2006; and Aibor and Olorunda, 2006) in order to ensure that human and other forms of existence are not jeopardized in any way which includes health and safety. Even though laws are meant to be obeyed, certain degree of enforcement is necessary to serve as a measure of control. For example, in 1990, the ‘Food Safety Act’, which is an Act of Parliament of the United Kingdom was promulgated following a prolonged period of frequent food poison outbreaks. Although The ‘Food Safety Act’ states in its part one that an operator of a public eating place is responsible for ensuring that the food in his or her food establishment is safe for human consumption, enforcement of the Act became necessary following reported outbreaks of food poisoning such as the E- coli outbreak in Scotland in 1996, six years after the enactment of the Act (FAO/WHO, 2003; Blanch, 2003).
Each region and country has their own specific laws, Acts or Regulations which guide the operations of public eating places. Bauchi state in the North-East geopolitical zone of Nigeria bears the same name as its administrative capital – Bauchi, and adopts the National Environmental Health Practice Regulations of 2007(Revised) as published by the Honorable Minister of Federal Ministry of Environment and Housing, Abuja. This document specifies the guidelines, as well as the *enforcement* powers bestowed on Environmental Health Officers to prevent and abate nuisance, protect, preserve and promote the physical, mental, spiritual and social well-being of the public through the prevention and control of the incidences of communicable diseases through environmental health interventions, and regulating private and public sector collaboration for the purpose of maintaining adequate sanitation, promoting public health and safety.

Sanitation issues in food production comprises of four components which include quality of the raw food, personal hygiene of the personnel handling the food, the sanitation of the environment where the food is being stored, prepared and served, as well as of the equipment being used. (Fosket and Ceserani, 2007). A default in the hygiene and sanitation standards of any of these components can result in food contamination and subsequently food poisoning which must be avoided.

The expected result of enforcement is compliance to the rules, laws or regulations being enforced by the appropriate authority. In Bauchi metropolis, it has been reported that in spite of the existence of the Food Safety Act and the National Environmental Health Practice Regulations, as well as the powers conferred on the Honorable Minister of Environment by Section 40 of the Federal Environmental Protection Agency Act of Nigeria to enforce these
Environmental Practice Regulations, there are still hygiene and sanitation lapses in the provision of foods and drinks in public places, (Ningi, 2009; Yakubu, 2009; Abdulsallam, 2009). The results of these researchers’ separate and respective studies on bacterial qualities of cereal and bean dumplings, ready to eat salads, and ice creams sold in public places in Bauchi metropolis show high percentage content of *staphylococcus aureus*, *shigella sp*, *Escherichia coli* (E.coli), *salmonella sp* and *bacillus sp*, of public health significance. From their investigations, it was evidently clear that poor personal and production environment hygiene practices, insalubrious sources of water and non adherence to other basic sanitation rules are responsible for the presence of these bacteria in the foods and drinks sold to the public.

The consequence of this uncheck potential public health risk was proved by the outcome of Aliboh (2009)’s investigation on Antibiogram and Serum Resistance of *E. Coli* Isolated from Clinical Specimen in Bauchi. The result revealed a disturbing re-occurrence rate of *E. coli* infection in both children and adults as confirmed by the records made available at the Bauchi State Specialist Hospital, just as the World Health Organization (WHO) in its 2007 World Health Report flagged an alert on the increase in food-borne disease outbreaks in many other parts of the world. Also, projects carried out by graduating students as well as field reports presented by students of the Hospitality and Tourism Management Department of the Federal Polytechnic Bauchi, who were returning from Industrial Training in many hotel establishments in the Bauchi metropolis, indicate observed unhygienic conditions of operation in the hotels where they are attached, especially in the food and beverage production and service areas (Adediran, 2003; Dimfwina, 2004; Idowu, 2005). This condition can undoubtedly result in food contamination and if ingested in appreciable quantity may lead to food borne-diseases.
The scenarios above raise the question of concern about the integrity and effectiveness of empowered regulatory bodies in the discharge of their duties since these are situations meant to have been avoided if the Food Safety Act and the Health Practice Regulations were being enforced. This is more worrisome considering the fact that in Bauchi state of Nigeria, the hospitality industry is witnessing a steady growth rate with a number of private individuals venturing into hotel entrepreneurship. This is evident in the number of newly established hotels in the State within the past four years when the number of hotels has increased from twenty eight in 2004, to thirty seven in 2007 as published by the Bauchi State Chapter of the Nigerian Tourism Development Corporation, (NTDC Bauchi, 2008). Public eating places such as hotels have been notorious and susceptible to being culpable sources of contaminated food (McLauchlin and Little, 2007).

The result of eating contaminated food is food poisoning (Duyff, 2006). Whereas accurate statistical figures were available for the developed countries, WHO raises a concern about the non documentation of food poisoning cases and food-borne diseases in developing countries of which Nigeria is one (World Health Organization, 2008). Since food borne diseases may go undocumented, the absence of a disease outbreak will result in a false sense of security which reduces vigilance and a relaxing of adherence to effective prevention programs such as maintenance of hygiene and sanitation standards as pre-empted by the World Health Report (2007).

Another major issue of documentation here is that endemic surveillances are often done by governments using statistics available at public hospitals. These records are normally of the general populace, majority of which do not eat in prestigious hotels. Assumedly, food
poisoning resulting from food contamination in a hotel may not be immediately traceable to such a hotel since individuals who eat from the hotels are often visitors who may only exhibit symptoms of food poisoning much later after they have checked out of the hotels and have gone to various parts of the country and beyond. As such, the effect of hygiene and sanitation infractions by hoteliers and restaurateurs may not be noticeable or appear to be very devastating or even result in an endemic food-borne outbreak to attract authority’s attention. Yet the effect on even an individual may lead to a small percentage of some long-term health problems (Duyff, 2006). This eventually has multiplier effects on the family and society.

1.2 PROBLEM STATEMENT AND JUSTIFICATION

One of the four basic principles of the European Environmental Policy as pointed out by Ramsley and Ingram (2004:56) is ‘prevention better than cure’. The cost of curing food-borne disease outbreaks as highlighted by WHO Fact Sheet, (2007) creates an enormous social and economic burden on communities and their health system in the form of medical costs and lost productivity. One way to ensure that hotel and restaurant operators do not compromise customers’ health in the provision of food and drinks is for the regulatory and enforcement agencies to constantly supervise to ensure continual compliance with laid down food hygiene and sanitation rules and regulations as argued by the FAO/WHO (2003). It is in the light of this, that this study aimed to investigate to establish the hygiene and sanitation compliance levels in hotels’ food and beverage operations in Bauchi metropolis and the extent to which relevant regulatory and enforcement authorities were ensuring hotels compliance with food hygiene and sanitation regulations in order to ensure prevention of food poisoning and food-borne diseases rather than to cure people affected by this menace.
1.3 OBJECTIVES OF THE STUDY

The broad objective of this study was to assess the level of compliance of hotels in Bauchi State with hygiene and sanitation regulations. This will be achieved by addressing the following specific objectives;

1. To assess the level of professional training held by both hotel operators and their food-handler employees
2. To establish if hotel operators and their food handler employees are aware of the hygiene and sanitation regulations which guide their operations in Bauchi state.
3. To find out if regulatory and enforcement agencies carry out their statutory role of enforcing compliance with the hygiene and sanitation standards effectively.

1.4 RESEARCH HYPOTHESES

This study was guided by the following alternative hypotheses;

H₁: The level of compliance of hotels in Bauchi metropolis with hygiene and sanitation regulations are above average.

H₂: There is a significant relationship between enforcement and the level of compliance with hygiene and sanitation regulations among hotels in Bauchi metropolis.
1.5 SIGNIFICANCE OF THE STUDY AND ANTICIPATED OUTPUT

Compliance with hygiene and sanitation standards by hotels will assure safeguarded public health through hygienic food preparation, leading to prevention of food contamination and sanitation-related disease outbreaks. The findings of this study will benefit stakeholders in the sector as it will serve as a guide to regulatory agencies in coming up with strategies that will ensure strict compliance with sanitation laws by hotels in Bauchi State. Hoteliers and restaurateurs will benefit from the understanding of their social responsibility of safeguarding public health through their operations. This study will also serve as reference material for future research.

1.6 DELIMITATION AND SCOPE

This study covered the activities of the food and beverage departments of Urban and Sub-urban classified hotels in Bauchi. It is limited to the Food Safety Act (1990) and the National Environmental Health Practice Regulations of 2007 (Revised) of Nigeria’s provision on food hygiene and safety as well as the relevant statutory functions of the Bauchi State Environmental Protection Agency (BASEPA), The Bauchi State Primary Healthcare Development Agency (BSPHDA) and the Bauchi state chapter of the Nigerian Tourism Development Corporation, (NTDC).

1.7 LIMITATIONS

The limitations of this study centers around the syllabi used for hospitality, hotel and catering management studies in Nigeria. The researcher noted that the syllabi only make reference to the Food Safety Act (FSA) 1990 as guide in teaching students the principles of food safety and hygiene but makes no definite mention of the Nigerian food safety regulations contained
in the NEHPR (2007) (Revised) or any previous editions. This means that food handlers who have undergone formal education and training in hospitality, catering and hotel management in Nigerian institutions, are only familiar with the FSA (1990) or any other international laws regarding food safety and hygiene. This constrains the researcher to adopt the FSA (1990) as the major document on food safety and hygiene in getting information from respondent.

Since the study was conducted in Urban and Sub-urban classified hotels in Bauchi Metropolis, the findings may not be applicable to the International, National, Rural and Unclassified classes of hotels in the metropolis. Nonetheless, the recommendations of the study will be applicable since hygiene and sanitation issues are general for all types of food operations.

During the study, data was collected only from hotel operators and food and beverage production and service staff, and the three relevant regulatory bodies but not from customers or the general public. This is because since customers are not allowed to the production (or back) areas of the hotels, and also, there are yet no reported outbreaks of food poisoning linked to the hospitality industry in Bauchi, the customers may not have any information as to the true hygiene and sanitary conditions of the hotels’ food production areas.

Another form of limitation for this study is lack of proper documentation of hygiene related crisis in Nigeria, especially in Bauchi state which can serve as a point of reference. This is a general problem of developing countries.
1.8 ASSUMPTIONS OF THE STUDY

The study assumed that to an appreciable extent, the hotel operators may not totally comply with hygiene and sanitation laws except through constant supervision and enforcement by regulatory agencies. It was also assumed that study participants were sincere in giving their responses in order to generate crucial information.

1.9 CONCEPTUAL FRAMEWORK

The following operational model, indicating the relationship between enforcement of sanitation regulations and safeguard of public health, was formulated by the researcher as presented in the diagram below:

![Diagram of the Food Safety Enforcement System]

**Figure 1.1: The Food Safety Enforcement System**

**Source:** Researcher, 2009
In this conceptual framework, the regulatory and enforcement agencies are empowered by Section 40 of the Federal Environmental Protection Agency Act to inspect and enforce the hygiene and sanitation rules regarding the raw food, hotel premises and equipment used for food preparation and service, as well as the personal hygiene of the food production and service personnel as specified in the National Environmental Health Practice Regulations. The efficiency of the regulatory agencies results in hygienic food production environment, wholesome finished food and drinks, and prevention of food contamination and food poisoning, all summed up as ‘Safe Food Production’.

As a system, the regulatory and enforcement agencies, armed with the relevant sections of the National Environmental Health Practice Regulations represent the raw materials and the inputs of the system which work on the four crucial operations components of the system which are the raw food, production premises as well as equipment used in the procurement, storage, preparation, processing, cooking and service of foods and drinks, as well as the personnel involved in all these stages. The expected output of the system is that food production in public places so regulated will adhere to basic hygiene practices resulting in the production and service of wholesome foods and drinks culminating into prevention of food contamination and poisoning. The horizontal single-headed arrows show the directions of the system operations while the horizontal dual-edged arrows indicate that the components they point to are interconnected to each other and must be engaged simultaneously.

The expected output of the system is only guaranteed when the inputs effectively perform their functions over the operations components hence the output (Safe Food Production) is the dependent variable, depending on the inputs (Regulatory and Enforcement Agencies and the Hygiene and Sanitation Regulations) which are the independent variables. The most
important aspect of this system is the execution of the independent variables on the four operations components of the system which are the raw food materials, the premises, the equipment and the personnel.

1.10 OPERATIONAL DEFINITION OF TERMS

**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 (Eastham *et al*, 2001).

**Food Business** – any undertaking whether for profit or not, and whether for public or private, carrying out any of the activities related to any stage of production, processing and distribution of food (Regulation [EC] No 178/2002, cited in McLauchlin and Little, 2007).

**Food Contamination** – food is said to be contaminated when it contains any unacceptable matter which can be in the form of micro organisms, poisons, or physical contaminants such as pieces of glass or metal (Blanch, 2003).

**Food Handler** – “any person in the food business who handles or prepares food whether open (unwrapped) or packaged (food includes drink and ice)” (UK Department of Health, 1995).

**Food Hazards** – anything that can contaminate food and make it unsafe to eat (Blanch, 2003).

**Food Holding** – maintaining food temperature at a particular level between when it was prepared to the time it is served. Food to be served hot should be held at 60°C. Food which may be ‘subject to microbiological multiplication’ must be held at no more than 8°C or above
63°C. (Food Safety (Temperature Control) Regulations, 1995, cited in McLauchlin and Little (2007)).

**Food Hygiene** – all sanitary measures, principles and procedures put in place to ensure that food is free from agents of contamination or disease germs in any form in order to promote a healthy living.

**Food Law** – the laws, regulations and administrative provisions governing food in general and food safety in particular. (McLauchlin and Little, 2007)

**Food Poisoning** – any disease of an infectious or toxic nature caused by, or thought to be caused by, the consumption of food or water (McLauchlin and Little, 2007)

**Food Premises** – any places where food or ingredients are stored, handled, processed or served.

**High-risk foods** – foods that are particularly attractive to microbiological growth such as raw meat, fish, shellfish, poultry, eggs, milk and dairy products, and cooked rice and pasta.

**Hot cupboards** - a device for holding hot foods prior to serving

**International Hotel** – The Nigerian system of hotels classification for hotels equivalent of five star rating.

**National Hotel** – The Nigerian system of hotels classification for hotels equivalent of four star international rating.

**Pathogens** – a 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.

**Premises** – these include the kitchen facility and its environment, the restaurant facility
and its environment, and the store facility and its environment.

**Rural Hotel** – The Nigerian system of hotels classification for hotels equivalent of one star international rating.

**Sanitation** - measures to protect public health through proper solid waste disposal, sewage disposal, and cleanliness during food processing and preparation.

**Sub-Urban Hotels** – The Nigerian system of hotels classification for hotels equivalent two star international rating.

**Tort of Negligence** – the breach of a legal duty to take care, resulting in damage to a claimant which was not desired by a defendant (Curzon, 2010).

**Unfit Food to Eat** - foods that either contaminated with pathogenic micro organisms or contain poisonous chemicals or foreign bodies (Fosket and Ceserani (2007).

**Urban Hotels** – The Nigerian system of hotels classification for hotels equivalent of three star international rating.

**Vehicles of Infection** – media by which disease-causing agents are transmitted (McLauchlin and Little, 2007)

**Wholesome foods** - Foods that are free of any form of contamination.
CHAPTER TWO

LITERATURE REVIEW

2.1. INTRODUCTION

Literature was reviewed in the context of identifying those hygiene and sanitation laws that guide hotels’ operations; hotels’ compliance to hygiene and sanitation laws; and the functions of the regulatory and enforcement agencies.

2.2 THE FOOD INDUSTRY AND PUBLIC HEALTH

The food industry, of which the hotel is an integral part, falls into the sector of the economy that is highly sensitive and crucial to the healthy living of the populace. Food is one of the most basic human needs. As Eastham, Sharples and Ball (2001) puts it, food is central to life, and as fuel, underpins all that we do. In as much as food is eaten primarily to sustain life, McLauchlin and Little (2007) opines food should be nourishing, attractive and free from noxious substances such as poisonous chemicals, toxins and pathogenic micro organisms. To achieve the above described food status that is fit for sustaining life, the food provider, needs in addition to preparing and presenting the food in an attractive way, take absolute care to reduce the occurrence of food contamination during the different stages of food processing. And in the words of Eastham, Sharples, and Ball, food should do good (or at least does no direct harm) to the eater.

Unfortunately, food, if not meticulously guarded against contaminations can do much harm to the eater than the good it is intended to do. This is because contaminated food can, and does result in food poisoning, and depending on the severity of the poisoning, can result in either illness or death. The WHO fact sheet number 237 (2007) reveals that food-borne diseases are
a widespread and growing public health problem, both in developed and developing countries with over 1.8 million deaths recorded globally in 2005 alone which had resulted from food contamination. In Bauchi state of Nigeria, data from the Microbiology Department of the State Specialist Hospital indicated a near epidemic re-occurrence of E. coli infection which is traceable to the consumption of contaminated food (Aliboh, 2009).

As revealing as the above facts are, Blanch (2003) and McLauchlin and Little (2007) observe that it was very difficult to come up with accurate statistical figures for food poisoning since most affected people do not report it. This then makes the need for all stakeholders in the food industry to ensure food safety most important. As stressed by Bowman and Russell (2001), there is a ‘farm-to-fork’ food safety continuum. Each part of the continuum (which includes the food premises in hotels) must perform its obligation in ensuring that what eventually gets to the food consumer is safe. Unfortunately, food service establishments contribute 97% of food borne illnesses due to food handlers’ malpractices (Worsfold and Griffith, 2003).

2.2.1 Causes of Food Poisoning

Food contamination is what results in food poisoning and food-borne diseases. Food contamination according to Hilton (2002); Blanch (2003); Morgan (2006) occurs when food contains hazardous substances that can make people ill. The medium of transmission include the four basic components of food production which according to Aibor and Olorunda (2006) and Fosket and Ceserani (2007) are quality of raw food materials, the food production environment, equipment used and the personnel involved.
2.2.2 Types of Food Poisoning

Food poisoning can be categorized into; chemical and metal, natural, and bacterial and mould, (Blanch, 2003; Knowles, 2002). Chemical and metal food poisoning occurs when foods are contaminated by chemicals either during growth of the food (for example through the use of pesticides), during its preparation (for example careless use of disinfectants), or during storage (for example, having substances incorporated in the storage vessel). Food can also be contaminated by several metals which may be found in cooking utensils such as Cadmium, Copper, Lead, Tin and Mercury.

Natural poisons (or toxins) occurring naturally in some foods such as red kidney beans, fish and sea foods like crabs and puffer fish and mushrooms. Bacterial and mould food poisoning can either be infectious, (where the illness is caused by eating large numbers of the bacteria) or toxic, (where the illness is caused by toxins produced by the bacteria or mould). Moulds produce toxins known as ‘mycotoxins’

Major Food-borne diseases from micro organisms include salmonellosis, caused by the *Salmonella* bacteria found in raw milk, eggs, poultry and other meats and chocolate. Its clinical symptoms include fever, headache, vomiting, abdominal pain and diarrhea; campylobacteriosis, caused by certain species of *Campylobacter* notably found in raw or undercooked poultry and drinking water, with clinical signs of severe abdominal pains, fever, nausea and diarrhea; Cholera is caused by the bacterium *Vibrio cholera*, and is contracted through water, fruits and foods that are contaminated, with the clinical presentation of abdominal pain, vomiting and profuse watery diarrhea which may lead to severe dehydration and possibly death. Other Food-borne diseases are infections due to *enterohaemorrhagic*
(causing intestinal bleeding), *E. coli* and *listeriosis*. These have been found to be among the most serious Food-borne infections (WHO, 2007).

Food contamination during and after preparation as enumerated by Blanch (2003) occurs largely as a result of poor personal hygiene, poor food handling, inadequate food preparation, poor storage area, as well as presence of pests and pets in food premises.

### 2.2.3 The Effects of Food Poisoning

According to WHO (2007), negative health complications and implications on individuals, families and the society, high mortality rates, as well as social and economic burdens on communities and their health system in the form of medical costs and lost productivity are the undesirable (sometimes preventable) consequences of food hazards which Bowman and Russell (2001) describes as ‘unnecessary’. As remarked by McLauchlin and Little (2007) the impact of food-borne diseases (notably diarrhea) in developing countries is very much severe. In view of these grievous upshots of food hazards, food production must involve stringent measures and close supervision to ensure that food is protected right from production to consumption.

### 2.3 HOTELS’ FOOD HYGIENE AND SAFETY REGULATIONS

The main international food hygiene regulations of importance to the caterer are the Food Safety (general food hygiene) Regulation of 1990, 1995 and 2002; and the Food Safety (temperature control) Regulations, 1995. There are also the Hazard Analysis and Critical Control Point (HACCP), the FAO/WHO Codex *Alimentarius* Commission’s standards, the Health and Safety Act of 1974, the Public Health Act of 1936, and the Food and Drugs Act among others (Boella and Pannett, 1999).
It has been observed by Knowles (2002); Leach, Mercer, Stew and Denyer (2001) that the FSA (1990) was formulated primarily for the European Union (EU) member states, to address prevalent food hygiene problems of that region of the world. As would be expected, the content and requirements are tailored to suit both the technology and climate of that region. Even though this study adjudges the content and requirements of the FSA (1990) to be universally adaptable, certain differing climatic and socio-economic conditions make it imperative for individual regions and countries to develop their own local food safety legislations which will take care of the uniqueness that food safety needs which the FSA(1990) may not be to provide or sufficiently addressed. This is in line with Knowles’s (2002); Leach, Mercer, Stew and Denyer (2001) view on same and the NEHPR (2007) of Nigeria is one such document that supposedly was to address the peculiar food safety requirements of Nigeria.

In Nigeria, the National Environmental Health Practice Regulations (NEHPR) of 2007 (Revised) which the Bauchi state has adopted contains all the requirements for food safety and hygiene which food providers at public places are expected to comply with. This document is an adoption of the Food Safety Act (1990). Hygiene and sanitation standards are specified in this document which has been expanded in Aibor and Olorunda (2006). The Regulation have specifications for the food premises (layout, floors, walls, ceilings, lighting, ventilation and drainage, refuse, sanitary conveniences, water supply, and facilities for washing hands, food and equipment); equipment (construction and cleaning); food handlers (personal cleanliness, protective clothing, personnel health and training); as well as specifications on temperature control; provision of first aid materials; and accommodation for clothing (changing room).

2.4 OVERVIEW OF THE FOOD SAFETY ACT (1990)

According to McLauchlin and Little (2007); the most important principles behind safe food production are the initial food quality; hygiene and care employed by food handlers during the preparation; prevention of the growth of micro organisms during storage, preparation stages and service; and the general design, cleanliness and maintenance of food preparation areas, storage areas, utensils and equipment used. By this, the four critical areas of concern, and for which control is very necessary and vital are the quality of the food and drinks raw materials used, the premises used in storing (store area), preparing (kitchen area) and serving (restaurant) the food and drinks, the personnel involved in handling both raw and prepared food, and the equipment and utensils used.

As mentioned above, the FSA (1990) is an internationally recognized food hygiene and safety guide from which many countries formulate their individual local food safety regulations such as the NEHPR of 2007 (Revised) used in Nigeria. These are comprehensive food hygiene and safety checklists encompassing all the four critical areas of food hygiene and safety enumerated above, as well as other critical food hygiene factors. These serve as basic minimum hygiene standards and serve as pillars for ensuring food hygiene and safety. The relevant conditions, provisions and expectations of these four critical areas of food safety and hygiene, as well as other critical food hygiene factors are discussed below.
2.4.1. Food premises: All sections of the food premises are clean and maintained in good repair

According to the FSA, (1990) and the NEHPR (2007), all sections of the premises where food-related activities are carried out such as hotels and restaurants must be clean and maintained in good repair. Specifically, the food premises comprises of the kitchen, (where edible food materials are brought together, combined and cooked in different ways for consumption), the restaurant (where food is served and eaten or taken away for consumption), and the storage area (where food and other materials are kept till they are required for use by the production) (Mohini, 2004). Stressed by Fosket and Ceserani (2007), is the fact that properly maintained premises ease cleaning.

Dirt and filth carry micro organisms which cause food–borne diseases, which can be transferred into food through the process of contamination. Dirty food areas are natural harbors for these germs. As observed by Blanch (2003), micro organisms like any living organism need certain conditions to grow and survive such as food, water, correct oxygen level, correct acidity/alkaline level, correct temperature, enough time and lack of competition. These conditions as pointed out by Duyff (2006) and Fosket and Ceserani (2007) are readily provided by dirty food preparation areas. A dirty food area also encourages cross contamination which is the transference of bacteria from another item or medium unto unaffected food. Therefore, a first step precaution against food hazards is to keep the food area clean.

Even though not all micro-organisms are dangerous, pathogenic bacteria (such as Salmonella, Staphylococcus aureus, Clostridium perfringens, and Escherichia coli (E. coli), yeasts and
moulds that produce toxins are types of micro-organisms that cause food spoilage and food poisoning (Duyff, 2006; Anita, 2002; McLauchlin and Little, 2007) To a large extent, routine and daily cleaning of the food preparation area, denies the micro-organisms the conditions which they require for growth, and as such reduces the possibility of their multiplication. Cleaning must form an essential part of every food-related operation. Maintaining high hygiene standards in the food area according to Mohini (2004) entails keeping all areas clean, clearing up as soon as work is done on a kitchen work surface or as soon as a table is vacant in the restaurant, and removing kitchen or plate wastes away from food handling areas immediately.

2.4.2 The layout, design, construction and size of the food premises are designed and built to ensure good hygiene

Food premises design as explained by Birchfield (2008), refers to the entire facility while the layout involves a consideration of each small unit or work space in the facility. Whether constructing an entirely new premises or converting an existing one, Knowles (2002) and Mohini, (2004) advices that the size of the facility should be determined based on the nature and amount of work to be done. It should be large enough to accommodate all materials and equipment required, as well as has consideration for the amount of space that will be required for completing tasks efficiently. The design should also make it possible to keep used and unused equipment away from the food in process and have adequate delivery facilities.

Food premises are to be designed and built to prevent access to pests, prevent contact between high risk and other foods, and between food and dirt, waste, rubbish, and unfit toxic materials. Other basic aspects of the design and layout of any food production area include
adequate space to allow hygienic practices. As warned by Blanch, (2003), overcrowded food facility encourages unhygienic practices and insufficient care over cleaning and maintenance routines.

The facility design and layout should also reduce health and safety risks to staff and others who might be in the working environment, incorporates a work flow (from point of delivery to the point of sale or service) that ensures prevention (or reduction) of cross contamination, allows for ease of supervision and have staff facilities such as office accommodation and where necessary, toilets and basins for washing hands (Knowles (2002); Birchfield, (2008); McLauchlin and Little, 2007; and Fosket and Ceserani (2007). In addition to these design and layout considerations, some food laws such as the General food Law Regulations of the UK (Regulation [EC] No. 178/2002) requires systems to be put in place to ensure the traceability of food or any substance intended to be incorporated into a food at all stages of production, processing and distribution (McLauchlin and Little, 2007).

During construction or conversion, holes for water, drainage, electricity, gas and ventilation services must be sealed and proofed. This is because ducts can provide routes for varmints to enter, live and infest buildings. Services, as suggested by McLauchlin and Little (2007) should be chased into walls where possible or fitted clear of walls to allow for proper cleaning.
2.4.3 All sanitary and hand washing facilities of the food premises are adequate and in good working conditions

Sufficient water closets, urinals and washbasins must be provided and maintained in a clean condition. Basins for hand washing must be placed in or adjacent to toilet cubicles as well as in food preparation areas where hands will be soiled from contact with raw food and other materials. As emphasized by Blanch, (2003), bacterial and cross contamination can be prevented through good standards of personal hygiene especially with regards to hand washing. This should be done after handling raw food, before handling cooked foods, after handling waste or visiting the toilet. McLauchlin and Little, 2007 advises that male and female sanitary and washing facilities must be separate, with a notice drawing the attention to the necessity to wash hands displayed in all sanitary facilities for staff and customers.

2.4.4 The food facility has washbasins with hot and cold running water and materials for drying hands

Regular hand washing is a requirement of all food handlers (Rippington, 2008). As a requisite toward ensuring personal (especially hands) hygiene, a food facility is expected to have either different taps for hot and cold running water or water blended to a suitable temperature. This is so since the higher the temperature, the lesser the chance for microbial growth. It is also recommended that there should be provision for liquid or dry soap, sufficient materials for drying hands such as paper towels, continuous roller towel providing clean portion for each person, and where possible, electric hot-air blowers (McLauchlin and Little, 2007). This is to ensure that hands are not re-contaminated through the sharing of hand-cleaning materials.
Hand washing as recommended by Rippington (2008) must be undertaken before commencing work, after using the toilet or being in contact with feaces, after breaks, between touching raw food and cooked food, before handling raw food, after disposing of waste, after cleaning the work space, after any first aid or dressing changes and after touching face, nose, mouth or blowing the nose.

2.4.5 The food premises has separate facilities for washing food and for washing hands

McLauchlin and Little (2007) suggests that not only should every food facility have separate facilities for washing food and hands, but also a separate one for vegetables and salad preparation. This is to ensure that whatever that is washed off the hands does not end up in the food.

2.4.6 The food premises has adequate ventilation facilities which are accessible and suitable for cleaning

Ventilation in food premises refer to means by which fumes, odors and stale air are expelled from the food facility. These should be efficient and sufficient as the operations of preparation, cooking, serving and wash-up generate large amounts of water vapor which if not extracted will condense, creating moisture that will drip from ceiling or run down walls. An adequate form of ventilation reduces the buildup of heat and odors. The control of humidity, volatile fats and cooking odors make cleanable or replaceable ventilation and extraction systems very essential. (McLauchlin and Little, 2007). Ventilation can be by both natural (opened windows) and mechanical (extractor fans, oven canopies, fans and filter systems) means. But in the opinion of Blanch (2003), natural ventilation is not always sufficient necessitating mechanical forms.
2.4.7 All areas in the food premises have adequate lighting

As opined by McLauchlin and Little (2007) and Blanch (2003), good lighting in kitchens improve concentration and safety, allows for thorough cleaning as well as deters insects and varmints from gaining entry into the premises hence suitable and sufficient lighting should be provided in food premises. All areas, including store rooms, food preparation, cooking, serving, vegetable preparation, wash up, food storage areas and cellars should have suitable and sufficient lighting provided. This is achieved through both artificial illumination and natural lighting without glare from direct sunlight. Light fittings (luminaries) are advised by McLauchlin and Little (2007) to be given to the sites of equipment and preparation areas including sinks, stores and tables.

2.4.8 The food premises has adequate drainage in all appropriate places

Drainages in food premises provide outlets for the many volumes of dirty water that is generated through the activities of food preparation and production. Drainages are recommended to be provided around cooking equipment and other items of equipment such as potato peelers, dishwashing machines and waste disposal units. Drainage channels should be covered with galvanized gratings which can be easily removed and trapped where necessary to prevent waste pipes acting as vents. (McLauchlin and Little, 2007).

2.4.9 The food premises has enough changing facilities

Staff changing facilities as prescribed by McLauchlin and Little (2007) should be situated away from food rooms but close to the staff sanitary and washing area. This is provided to store and dry outdoor clothing and other personal effects of employees.
2.4.10 **Food Rooms:** All rooms’ floors, walls, ceilings and other surfaces are maintained clean and disinfected

Food hygiene as explained by McLauchlin and Little (2007) refers to those practices that tend to exclude and/or eliminate harmful microbes or their products from the diet. These hygienic practices must be extended beyond the food itself to the environment in which the food is prepared to prevent contamination. The accumulation of dirt on surfaces, floors, walls and ceilings of food storage, preparation, production and service areas undermines food hygiene, hence the requirement for the cleaning and disinfection of floors, walls, ceilings and other surfaces.

Disinfection as defined by McLauchlin and Little (2007) is the killing or reduction of microbes down to safe levels. This can be achieved by using heat or chemicals to kill the microbes during cleaning. Since microbes that cause food contamination and/or food poisoning thrive in environments such as food preparation areas, disinfection of these surfaces should be purposefully done routinely so as to ‘interrupt’ routes of transmission of infection. This process as recommended by McLauchlin and Little (2007) is not to be sporadic or random but should be accurately targeted especially at those areas where microorganisms are more prone to thrive like worktops.

The purpose of cleaning, disinfection and sterilization is to remove ‘soil’, kill, remove or totally eliminate microbes in order to ensure safety by preventing both food poisoning and spoilage. While disinfection kills microbes, cleaning as a process removes physical unwanted matters which can contain microbes that are responsible for poisoning or spoilage. As such, Fosket and Ceserani (2007) and Mohini (2004), recommend that preparation surfaces such as
utensils and containers should be regularly cleaned and always cleaned in between the preparation of different dishes. Also, all surfaces are to be thoroughly cleaned with hot water which contains detergent, rinsed and dried.

Floors and walls are to be impervious, easily cleaned and durable. Floor surfaces should be absorbent, anti slip and without joints and crevices where dirt, bacteria and insects can lodge. Walls should have suitable cleanable finishing with special provision for wall surfaces near sink areas and near sources of heat. (Birchfield, 2008; McLauchlin and Little, 2007; Mohini, 2004),

2.4.11 There are enough facilities, tools and equipment for cleaning purposes

For hygiene practices in food preparation areas to be carried out effectively, the materials designated and used for cleaning must be sufficient. These materials include cloths and traditional string mops, sponge mops and brushes, buckets, dish washing machines, and vacuum cleaners. Coincidentally, some types of these materials are also used in parts of food preparations such as buckets and clothes. Items used for cleaning should not be used in any part of food preparation otherwise they can re-contaminate cleaned surfaces, making a nonsense of the whole hygiene and sanitation process and practices.

As stressed by McLauchlin and Little (2007), items used for kitchen cleaning and food preparation (for example floor clothes and work surface clothes), are not interchangeable. Hence the facilities, tools and equipment used for cleaning purposes must be sufficient to avoid ‘borrowing’ the ones used in food preparation, for cleaning. They should also be so
labeled or color coded so that a staff does not mistake one for the other and also be effectively segregated and frequently decontaminated.

2.4.12 **Equipment:** All utensils, fittings and equipment that can come into contact with food are made of materials that can be kept clean

Utensils, fittings, machineries and equipment used in food preparation and service are required to be such that can be easily cleaned both in construction and in material types, to prevent them from becoming reservoirs for contamination. It is expected, as opined by McLauchlin and Little, (2007) and Fosket and Ceserani (2007), that some of the criteria for selecting and purchasing a food preparation, production and service equipment should be that the equipment is so designed, and can be sited in such a way that all its surfaces are accessible for cleaning, every of its part and/or accessories can be reached and removed easily, are readily dismantled and reassembled, and are made of materials that are non-absorbent and resistant to damage by cleaning or disinfection. Kitchen equipment made from wood should be of impervious, easily cleaned materials.

2.4.13 **All equipment are moveable to ensure cleaning of surrounding areas**

Cleaning processes such as sweeping, mopping and vacuuming may be hindered if big and heavy equipment and machines are standing on the way. These may harbor dirt, food particles, rodents and pests behind them. Partial cleaning undermines cleaning efforts as those places not reached still pose health and hygiene hazards.

An important factor of effective cleaning around kitchen equipment is the way the equipment are arranged. There are several forms of kitchen equipment arrangements the most common
are the U- shape, L-shape and island arrangements. Part of the underlying factors for the choice of equipment siting should include ease of cleaning and movement. Equipment are either fixed, wall mounted or mobile. For ease of cleaning, equipment must be accessible or mobile and if fixed, should have a space of at least 300mm behind them as recommended by McLauchlin and Little (2007). Moveable equipment and worktops facilitate cleaning. Island grouping of cooking appliances refer to an arrangement whereby all the cooking equipment are arranged at the middle of the kitchen, sometimes back-to-back and fitted with splash backs. This system has been opined by McLauchlin and Little (2007) to be convenient for the extraction of steam and odors, and saves space but does not allow for items’ movement for cleaning.

2.4.14 Food waste: All food and other wastes from the food premises are disposed of quickly to avoid accumulation

During the course of preparation, wastes are generated in the store, kitchen and restaurant. These wastes are either organic (waste food, used cooking oils,) or inorganic (papers, plastics, cans). These wastes become breeding grounds for microbes and serve as potential sources of contamination when allowed to accumulate, or become centers of attractions for rodents, pests and flies if not disposed of properly. McLauchlin and Little, (2007) recommends immediate waste disposal by disintegration and flushing to the drainage system as the most convenient method of waste disposal in line with Blanch, (2003)’s recommendation that external waste storage areas be paved, and raised above ground level. Fosket and Ceserani (2007) also maintain that accidents, contamination, pest infestation, unpleasant odors, fire hazard and pollution are prevented with correct clearing and handling of wastes.
2.4.15 All containers for food and other wastes can be closed, cleaned and disinfected, and all storage and waste disposal facilities are designed and built so that they are easily cleaned and are pests proof

The main purpose of these clauses is both to avoid as well as to control pests’ infestations. Pests infestations have been noted by Fosket and Ceserani (2007) and McLauchlin and Little (2007) to be caused by inadequate cleaning, poor building maintenance, as well as suppliers’ deliveries. Common food area pests include rodents (such as rats, mice, squirrels), birds and insects (such as cockroaches, flies, ants and wasps). Pests in food production areas are not only unsightly and repugnant, they also cause damage to food and building; introduce pathogens to food, animals and areas where food is produced, stored or processed; contaminate food products by means of their bodies or body parts, fur, eggs and droppings and are a potential source of infection. (Blanch, 2003 and McLauchlin and Little, 2007).

Infestation of pests as suggested by McLauchlin and Little (2007); Blanch (2003); Fosket and Ceserani (2007) is controlled by denying the pests access, harbor, warmth, sources of food and water into and in the premises. This is achieved through appropriate design, construction and maintenance of buildings, regular visual inspection of the premises, regular cleaning of spillage and food storage areas, proper management of all containers used for food and other wastes storage and disposal, as well as checking all deliveries on arrival and rejecting them if they are found to already be contaminated or infested. Refuse must be collected in properly covered and frequently emptied metal or plastic dustbins. Foods should be stored in sealed containers, preferably off the ground and away room walls.
2.4.16 Water supply: The food premises has adequate supply of portable drinking water, and all ice consumed in food premises are made from drinking water

Water in the food industry is used extensively for drinking, cleaning and preparing food, washing up, washing hands, equipment, utensils, containers clothes, and flushing wastes among others. It is necessary to ensure that contaminated water is not used in any form (whether for drinking, preparation, cooking or washing) so as to prevent contamination and infection leading to water-related diseases such as diarrhea and cholera. This is so since the water used in the preparation of foods and drinks eventually become part of the food or drink and are consumed together.

In recognition of the fact that the sources of water used in food preparation go a long way in determining the quality and the safety of the water, and that water can act as a vehicle for a number of infections other than those which cause typical food poisoning (Knowles, 2002), government regulated (quality assured) sources of water supply are chlorinated. This is because, as pointed out by McLauchlin and Little (2007), the quality and quantity of water provided by utilities has a direct bearing on the economic and physical health of communities. The contamination of water as opined by McLauchlin and Little (2007) is to be largely controlled through the implementation of The Hazard Analysis and Critical Control Point (HACCP) but noted with concern that this can be a problem especially in developing countries where the processes and infrastructure of food production and retail are less developed.

It is expected that all food establishments source their water from government regulated main water pipes but where a food premises cannot access the main drinking water supply, private
water supply can be arranged. The sources of private water supply range from deep boreholes to springs, and wells. These however, are strongly influenced by surface waters (McLauchlin and Little, 2007). All sources of water, whether private or from the mains must be protected from being contaminated by sewage. It should be monitored and must meet all parameter set out in relevant government water regulations. As spelt out in FRN (1998), owners of private water supply such as borehole or similar water points in Nigeria, must make an application to the Health Department who shall have the source of water inspected. Water from such sources must conform to the National Standard for drinking water quality of the Federal Ministry of Health. In addition to having regular water supply, it should also be sufficient enough for the volume of work done so as to guarantee continuous cleaning, washing as well as eliminate the possibility of recycling water domestically which can pose contamination risks.

2.4.17 Personal hygiene: All staff handling food wear suitable, clean and appropriate protective clothing

Personal hygiene is the maintenance of personal health, particularly by cleanliness (McLauchlin and Little, 2007:169) which according to Rippington (2008) is achieved through daily bathing or showering, wearing clean underwear, caring for the hair, mouth, teeth, hands and nails. These are described by Rippington (2008) as part of the ‘personal and professional responsibilities’ of people working in the hospitality and catering industry in other to ensure food safety.

Food production activities at whatever level, whether total or partial cooking, and whether using raw food stuff or convenience foods, require human beings to perform the activities. As
stated by McLauchlin and Little (2007) food handlers can be a source of food contamination and/or facilitators of cross contamination while Blanch (2003) puts it more strongly that humans are probably the most common source of bacterial food contamination. Food handlers, like any other living organism, have commensal organisms living on or in them. Through constant contact with food, micro organisms found on the human hands, hair and skin, in the nose throat and gastro intestinal tract can be transferred unto food. Aside from this, food handlers can also contamination food with body objects such as hair, skin, nails and jewelries hence the need for proper personal hygiene and wearing of protective clothing.

Protective clothing refers to the official clothes that are worn by food handlers commonly known as staff uniforms or staff dress. As submitted by McLauchlin and Little (2007) these are intended to protect foods from the food handler and not vice versa, for this reason virtually every part of the food handler should be covered. The components of the protective clothing include the overall and aprons to protect the body; hats, hair coverings or nets to keep the hair from falling as well as discourage touching; snoods for beards and moustaches; and flat comfortable foot-wears that cover the whole feet. All these should always be clean, so that they do not in themselves become sources of food contamination, should be light colored to show dirt, should be washable, in good condition, and worn only in food handling area and never outside. (Blanch, 2003; McLauchlin and Little, 2007; Rippington, 2008).

2.4.18 All staff handling food are healthy, that is free from any disease that can be transmitted through food

Certain clinical sicknesses or diseases are capable of being transmitted from person to person. The food production area is usually a hub of activities involving several people working
together and at close proximity. This makes the food production area, an infection high risk area as contagious diseases can be easily transmitted from one person to the other. This is aside from the risk of sick staff contaminating the food. For these reasons, persons suffering from diseases that are likely to be transmitted through food such as with open infected wounds, skin infections, sores or diarrhea are prohibited (by law) from handling food or from entering any food-handling area in any capacity especially if there is any likelihood of direct or indirect contamination.

In Bauchi state of Nigeria, food handlers and their employers are expected to be certified fit (issued with a ‘Certificate of Fitness’) by a government authorized health professional, before being allowed to work in public food production areas by after going through comprehensive medical examinations. This should be a periodic exercise (NEHPR, 2007).

2.4.19 All food handlers are well trained in food hygiene to an appropriate level and are closely supervised

McLauchlin and Little (2007:313) defines food hygiene education as the ‘process of acquiring knowledge and training for the prevention and control of food-borne disease’. Training as explained by Knowles (2002:252) ‘implies that the recipient will have a greater level of understanding at the end of the process’. Managers have a legal obligation to ensure that all food handlers in their employment are trained to appropriate levels, using methods suited to the staff being trained as well as keeping records of the level, coverage and date of training for each member of staff. Of importance to note, is Knowles (2002)’s recommendation that training should transcend even to senior supervisors and managers who
may not actually handle food but have direct influence on the hygienic operations of the food business.

WHO (2007) identifies the training of food handlers in safe food handling as one of the most indispensable interventions in the prevention of Food-borne diseases. To buttress this is the recommendation emanating from the research carried out by Leach, Mercer, Stew and Denyer (2001). The research advocated for the inclusion of food safety in the National Curriculum as well as the re-evaluation of the priority the catering industry attaches to food hygiene. Equally indispensable is the supervision of food handlers while performing their job. This is critical in ensuring that food hygiene is not compromised in any way and for any reason. As asserted by Blanch (2003:33), ‘all food handlers are responsible to some extent, for controlling or eliminating food hazards to ensure that the food they prepare and serve is fit for human consumption’.

Employees in the food production section particularly are expected to be under constant supervision to ensure hygiene quality control. For example, during the course of work, supervisors are to ensure that food handlers are hygienic in themselves and work hygienically, wear clean clothes and uniforms, handle food as little as possible, wash hands before and during work and after using the toilet, keep hair clean and do not handle, keep fingernails clean and short, do not touch nose and mouth with hands, do not cough or sneeze over food, do not wear rings, earrings, jewelries or watches, do not smoke in food areas, taste food only with clean spoons, do not sit on work surfaces, and that they cover all open cuts and burns with blue or any detectable waterproof dressing (Tricket, 2001; Blanch, 2003; Fosket and Ceserani, 2007).
Furthermore, supervisors must make efforts to ensure that cooked foods remain covered to prevent foreign objects falling in them and that clean dishes and utensils are used for serving as recommended by Duyff (2006). However, in the event that the numbers of staff in a food establishment are very few and employing a supervisor is unrealistic, Knowles (2002) advises that the staff must be adequately trained that they would not require a supervisor while carrying out their food processing duties.

Food handlers are also expected to be given written and verbal instructions in the essentials of food hygiene before they start work (Blanch, 2003; Fosket and Ceserani, 2007; McLauchlin and Little 2007). Education and training is believed to get the trainee informed so as to be able to perform given tasks effectively and with understanding. As avowed by Blanch, staff are more likely to follow procedures if they have an understanding of the reasons behind them. With adequate education and training, a food handler should be able to maintain a high hygiene standard which is a critical element in the prevention of contamination by food handlers.

Hospitality based education and training can be obtained either on-the-job (in-house) or at training institutions (Tricket, 2001). If to be delivered informally or as part of in-house procedures, Knowles (2002) cautions the course content must be appropriate. As recommended by McLauchlin and Little (2007) training and instruction in the principles of food and personal hygiene and how to prevent food-borne diseases should be on-going, coupled with adequate supervision (to ensure compliance with hygiene requirements). In Nigeria, education and professional training in hospitality, hotel and catering management are available at different levels (Basic Certificate, Advanced Certificate, National Diploma [ND],
Higher National Diploma [HND] and Post Graduate Diploma [PGD]), and in different types of accredited education and training institutions such as Institutes, Colleges and Polytechnics. The Basic Certificate and Advanced Certificate courses qualify a student as an operational staff. Operational staff are the employees who perform the everyday practical operations. These are the staff that cook and serve food to the customers in the food and beverage sections of the hotel. A completed Diploma course qualifies the student for supervisory posts in the industry. Supervisory staff are more experienced than, and oversee the work and performance of operational staff. The graduate professional with a Higher National Diploma and/or Post Graduate Diploma has been prepared for managerial positions in relevant fields of study as specified in the NBTE syllabi.

Managers in the hospitality industry have responsibility for ensuring organizational best practices and ensuring customers receive the products and services they expect (Rippington, 2008). Conclusions derived from certain researches show however that either managers of food businesses are not trained (Mortlock, Peters and Griffith, 2000), are not trained to train, or where training occurs in-house, the contents are ill-defined (Worsfold and Griffith, 2003).

2.4.20 Foodstuff: Food raw materials which are contaminated or are suspected of being contaminated are never used

As stated earlier, initial raw food quality constitutes one of the most principal and fundamental factors of safe food production. Since the quality of the raw materials used will eventually determine the wholesomeness and safety of the finished product for consumption, it is important that great care is taken in the purchase, storage and eventual processing of the raw materials. The basic factors to consider in the choice and use of raw materials are that
they must be bought while still very fresh, uncontaminated by pests and then stored appropriately and in proper manners to eliminate contamination from either other foods, rodents or chemicals such as detergents or aerosols (McLauchlin and Little 2007; and Blanch, 2003).

Foods which are susceptible to supporting the growth of pathogenic bacteria or the formation of toxins must be stored at temperatures below $8^\circ$C (Tricket, 2001) Expired products or deteriorating perishables like meats and tomatoes, aside from giving the food unpleasant tastes, are also sources of contamination and potential food poisons for which reasons they must be avoided (McLauchlin and Little, 2007).

In Nigeria, raw food materials are often ordered and purchased either from the open markets, directly from the farmers or from stalls and supermarkets. The quality of food materials sold to the public, whether raw or processed is closely monitored by the National Agency for Food, Drugs Administration and Control (NAFDAC).

2.4.2.1 All stages of food preparation are protected from being contaminated

Typical stages of food production will include procurement, receiving, storing, ordering, pealing/cutting, cooking, holding, and serving, washing-up and waste clearing (Mohini, 2004). In all these stages, foods are handled and placed on surfaces, in equipment and in utensils. From one stage to the other, there should be hygiene quality control, a clear location demarcation and should follow a logical sequence so much so that the current stage does not reverse back to the previous stage and/or location as proposed by Birchfield (2008). Cooked foods are not to be placed on the same tables/surfaces/plates with raw foods, or handled by
the same person at the same time. Separate boards and knives are to be used for cooked and uncooked foods (Fosket and Ceserani, 2007). Every equipment used at each stage should be cleaned and sanitized where necessary and immediately so that at no point in the preparation stage or process is the food contaminated. In the first place, the facility should be built in such a way that it allows for free movement of materials and personnel.

2.4.22 **Temperature control:** The food premises has facility for holding food at appropriate temperature before service

It is undeniable that all customers to a restaurant do not all come at the same time and foods cannot be prepared quickly enough on each customer’s demands on arrival hence the need to make some cooking preparations in advance and in anticipation of customer. While waiting for the customers’ arrival, it becomes necessary to keep and maintain the prepared food at appropriate temperatures. This according to Mohini (2004) is called food-holding and that appropriate food holding prevents microbial activities as well as ensure their safety for consumption. Since bacteria grow between 7°C (45°F) and 63°C (145°F) and food poisoning bacteria multiply rapidly at body temperature foods are not to be kept in the ‘danger zone’ of between 5°C and 63°C for longer than absolutely necessary. Food that is to be served hot should be held at over 63°C using the hot cupboard (Fosket and Ceserani, 2007) and those to be served cold should be cooled quickly to prevent new bacterial growth using a blast chiller or separate refrigerator specifically used for cooling. As deemed by Blanch (2003), temperature is the most effective way of controlling the growth of micro organisms.

Aside from holding food at appropriate temperature before service, certain foods, by virtue of their nature, also need to be stored at special temperature ranges. According to Anita (2002)
chilled food should be stored between 1°C and 8°C. Frozen foods at -29°C and not higher than -18°C. As advised by Duyff (2006), food should be stored at the right temperature and for the right length of time, not only to prevent microbial growth but also to maintain the food’s quality and nutrients. For this reason, further advised by Duyff (2006) and Mohini (2004), cupboards and pantries should have storage temperature ranges of 50°F and 70°F, refrigerators or cold storage between 34°F (0°C) and 40°F (5°C), and freezers, below 0°F or less (0 to -20°C).

2.4 FOOD HANDLERS’ AWARENESS OF FOOD HYGIENE REGULATIONS

The result of a study carried out by Subratty, Beeharry and Chan Sun (2004) shows that of the fifty food handlers that participated in the study, 52% of them claimed to be aware of the Food Safety Act through some food safety trainings they had been. Of this, only 30% were able to answer correctly, the questions relating to the FSA. In the same vein, Aibor and Olorunda (2006) asserts that in Nigeria most food handlers are not aware of common hygiene rules. This informs the need to improve on the emphasis paced on food safety training especially for potential and existing food handlers just as the FSA (1990) emphasizes the need for both food business owners and food handlers to be adequately trained.

The process of training as discussed by Subratty, Beeharry and Chan Sun (2004) informs the trainee about the regulations and laws guiding their operations but due to ill-defined training contents (Worsfold and Griffith, 2003), inappropriate training (Mortlock, Peters and Griffith, 2000; Aibor and Olorunda, 2006), negative perceptions and attitude to training (Subratty, Beeharry and Chan Sun (2004), inability to meet training costs (Coleman, Griffith and Botterill, 2000) and enforcement agencies’ in effectiveness (Holt and Henson, 2000).
Formal hospitality education and training have been identified as the most authentic medium of getting informed about food hygiene and safety regulations requirements and principles. The FSA, (1990) specifies that trainings and instructions received by food handlers and their supervisors be commensurate with and related to the type of work activities they carry out. In the event that an overriding percentage of food processing and service staff do not have sufficient knowledge about food hygiene and safety, ineffective or total absence of hygiene standards and codes of practice in the food production and service sections of the hotels normally results.

2.5 HOTELS’ COMPLIANCE WITH HYGIENE REGULATIONS

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; Mortlock, Peters and Griffith, 2000; Colman, Griffith and Botherill, 2000). In line with this, criticizing food management in one of the developing countries, Mohini (2004), regretted that ‘…the kitchens of establishments irrespective of their size and location do not maintain standards which can be benchmarked or spoken about with a sense of pride’.

Previous researches carried out on hygiene practices among food handlers, such as Olsen et al (2000); Clayton and Griffith (2004); Subratty, Beeharry and Chan Sun (2004), indicate prevalence of poor hygiene practices among the food handlers. An observation of food safety
practices carried out on 115 food handlers in South Wales shows that only 16 (14%) of the study participants carried out adequate hygiene practices (Clayton and Griffith, 2004). Such hygiene infractions account for the fact presented in Olsen et al (2000); Clayton and Griffith, (2004) commercial catering premises are the most frequently identified settings of food borne disease out breaks, accounting for 45% of outbreaks in the US between 1993 and 1998.

Similarly, Subratty, Beeharry and Chan Sun (2004) found out that of the fifty-five food handlers researched on, a majority of them even though aware of prerequisite hygienic conditions to be observed while handling and preparing food do not implement their knowledge in practice. This the study attributed to ineffectiveness of enforcement agencies. It is worthy to note that these incidences happened in civilized places and environments where laws are expected to be obeyed. This then underpins the very significant importance of enforcement of food hygiene and safety laws and the critical role enforcement agencies have to play. It is believed that through enforcement, food safety standards can be maintained at an acceptable level (Knowles, 2004).

As put forward by Fosket and Ceserani (2007), almost all food poisoning can be prevented by complying with rules of hygiene, ensuring that high standards of cleanliness are applied to premises and equipment, and paying specific attention to high standards of personal hygiene among several other factors. Also, Morgan (2006) postulated that the two major paths to preventing food-borne diseases are by proper sanitation in the kitchen and good personal hygiene. Unfortunately, Aibor and Olorunda (2006) asserts that in Nigeria most food handlers are not aware of common hygiene rules and most are not routinely screened for certain serious communicable infections that can be transmitted through the contamination of the food they prepare for sale and human consumption. The attendant repercussion of this is that
these food handlers, through their food production activities are ignorantly contributing significantly to the etiology of food-borne diseases which in most cases result in epidemic outbreaks Aibor and Olorunda (2006).

Examples of incidences of food-borne disease outbreaks include that of salmonellosis outbreak in the USA in 1994 due to contaminated ice cream, affecting an estimated 224,000 persons. In China 1988, three hundred thousand people suffered from an outbreak of hepatitis A, resulting from the consumption of contaminated clam (WHO, 2007). General outbreaks of food poisoning were reported in England and Wales between 1992 and 2005. Although these occurred in a wide variety of settings, restaurants and hotels accounted for 26 and 11 percents respectively of the reported incidences (McLauchlin and Little, 2007). In Nigeria as documented in Aibor and Olorunda (2006), cholera and typhoid cases have increased from 9,254 and 68,846 cases respectively in 1998 to 10,294 and 73,949 cases respectively in 2001. In 1998 alone, there were 32,411 reported cases of food poisoning. In spite of these staggering figures, McLauchlin and Little (2007) claims the extent of diarrheal disease in developing countries (like Nigeria), is much more difficult to define.

2.6 ROLES OF REGULATORY AND ENFORCEMENT AGENCIES

Noticeably, every law, legislation Act or regulation always includes sections of enforcement. It is then assumed that this is considered necessary because laws may be disregarded or not complied with except they are enforced. Regulatory and enforcement agencies acting on the behalf of the government have the responsibility to draft relevant regulations. They are also responsible for implementing and enforcing the passed laws, legislations, Act or regulations. Specifically, the roles of regulatory and enforcement agencies are;
2.6.1 Drafting Legislations/Regulations

The most fundamental principle behind food legislations is consumer protection and health. As suggested by Eastham, *et al.* (2001), all food regulatory frameworks must be designed and implemented such that food producers and the hotel industry have the primary responsibility for the production of safe and wholesome food. Such legislations, which should include appropriate internal monitoring procedures, and ability to identify major risk factors and the means of managing these risks, should also guarantee that food is safe, wholesome and fit for human consumption; that commercial transactions are conducted fairly, and that the necessary official control and inspections are put in place. Also, Blanch (2003) argues it is important that legislations be clear and devoid of being misinterpreted. Aside from these, Bowman and Russell (2001) advocates that legislative food safety built in mechanisms, be flexible and continually evolving since challenges form new pathogens, new vehicles of transmission and new risk factors will definitely continue to arise.

In Nigeria, National Environmental and Public Health laws are initiated by the Federal Ministry of Environment and ratified by the Federal Executive council. It is reviewed by the Judiciary (Ministry of Justice) before being passed to the National Assembly for joint deliberations and when supported by the two-third majorities, it is assented to by the President and Commander-in Chief. Then it becomes a law. The National Environmental Health laws once signed into law is effective in all States of the federation (Aibor and Olorunda, 2006).
2.6.2 Inspection and Enforcement

Internationally and locally, the Food Safety Act (FSA) and relevant sections of the National and State Environmental Health Laws in Nigeria respectively, confers the authority on Environmental Health Officers to enter and inspect food premises at any reasonable time, on regular basis. (Fosket and Ceserani, 2007; Aibor and Olorunda, 2006). The renowned quality expert Dr. Edwards Deming’s 14 point for quality assurance is noted to acknowledge inspection as a principal means for quality control and that routine inspection can at least detect a defect where one exists. Deming advises that inspection should be used as an information gathering tool for improvement and should be integrated into the quality management practice of organizations (Evans and Lindsay, 2008). The Code of practice No 9: Food Hygiene Inspection (revised 1997 and 2000) issued under section 40 of FSA (1990) offers guidance for enforcement officers and the nature of inspections to be carried out to assess the hygiene of premises. Regrettably, such code of practice is not found in the NEHPR (2007) of Nigeria or any such related literature.

Applauding the positive and imperative impact of enforcement on compliance, Knowles (2002) observes that the introduction of the FSA (1990) and enhanced enforcement powers as well as intensified penalties for some offences has caused some caterers to improve on their food operation practices. Among the European Union (EU), Local Environmental Health Officers have the mandate of enforcing food safety legislations by dealing with hygiene of food and food premises while Trading Standards Officers deal with the labeling of food (Fosket and Ceserani, 2007). In Nigeria, the Public Health Laws (1998) specifies that it shall be the duty of Environmental Health Officers to enforce the provisions of environmental and public health laws, but in the absence of a medical officer of health, it shall be the duty of every Local Government Area to ensure enforcement (FRN, 1998).
The positive impact of enforcement on compliance as applauded by Knowles (2002) in the preceding paragraph however does not agree with the research findings of Zhe Jin and Leslie (2003); Worsfold and Griffith, 2003; Subratty, Beeharry and Chan Sun (2004); Yapp and Fairman (2004) which indicate that much need to be desired of enforcement agencies. For example, Worsfold and Griffith (2003) reported that in spite of the role of health inspectors in promoting hygiene standards, food handlers still have much to be desired. Factors challenging regulatory and enforcement agencies’ effectiveness in maintaining food safety standards among food business operators include large number of food units, low educational level of many food business operators, general poor knowledge of good practices in food hygiene and the crude conditions under which some food business operators operate (Subratty, Beeharry and Chan Sun, 2004).

2.6.3 Prosecution

Other functions of enforcement agencies include; issuing improvement or Emergency Prohibition notices or orders (in Nigeria, abatement order or prohibition order), prosecuting proprietors for breach of food hygiene regulations, and closing down food premises as appropriate. There are also spelt out penalties for defaulters ranging from fines to imprisonment (FRN, 1998; Tricket, 2001; Blanch, 2003).

2.6.4 Granting approvals

Legally, it is required of a prospective hotel or restaurant entrepreneur to register with the Local Council (In Nigeria, the Local Health Officer and the town planning authority of the Local Government Area where such building is to be located) and seek for permit/ license to operate a food business irrespective of whether the premises is to be built, leased or
converted. The permit will be granted upon fulfillment of certain conditions including the hygiene and safety factors of the premises intended to be used for the food business. Also, the Hospitality and Tourism Establishments (Registration, grading and Classification) Regulations of 1997, stipulates that no person may operate a Hospitality or Tourism establishment unless such has obtained a current certificate of registration from the Nigerian Tourism Development Corporation, NTDC (FRN, 1997).

2.6.5 Relevant regulatory and enforcement agencies in Bauchi state, Nigeria

In Bauchi state Nigeria, relevant regulatory and enforcement bodies include;

1. **The Nigerian Tourism Development Corporation (NTDC).** This was established by decree 81 of 1992 and has chapters all over the federation. The main functions of the corporation among many others include; ‘encouraging the provision and improvement of tourism amenities and facilities in Nigeria, including the development of hotels and ancillary facilities’; and ‘to register, classify and grade all hospitality and tourism enterprises, travel agencies and tour operators in such manners as may be prescribed’. (FRN, 1992:A762-763).

The corporation has a division under it, known as the ‘Hotel Inspectorate Division’. The duties of the Division are;

a. ‘To register, classify, grade, and monitor hotels and other hospitality establishments’; and

b. ‘Charge fees and impose such sanctions as may be prescribed from time to time by the Corporation’. (FRN, 1992:A762-763).
2. The Bauchi State Environmental Protection Agency (BASEPA).

Established in 1997 by the Bauchi State Environmental Protection and Conservation Agency Edict Number 3, the Directorate of Pollution Control under the Agency, among other functions is responsible for;

   a. Waste management,
   b. General sanitation and inspection of premises, and

3 The Bauchi State Primary Healthcare Development Agency (BSPHDA).

Under this Agency, the Food and Food Premises inspection Unit is responsible for among others;

   a. Public health and Hotels inspection,
   b. Regulate private and public sector collaboration for the purpose of maintaining adequate sanitation, promoting public health and safety, as well as
   c. Prevent and control the incidence of communicable diseases through environmental health interventions (NEHPR, 2007).

2.7. LEGAL ASPECTS OF FOOD HYGIENE AND SAFETY

The food industry like any other is regulated legally and some of the legal issues are discussed as follows:
2.7.1 Ensuring Food Hygiene and Safety

Recognizing the food industry as a major economic player, the FSA (1990) makes every food provider at public places legally responsible for all aspects of the food they sell (Eastham, Sharples and Ball, 2001). As enumerated under 2.3 ‘hotels’ food hygiene and safety regulations’ above, food laws make provision in several forms for food meant for human consumption to be absolutely safe. An outline of the Food Safety Act (FSA, 1990) recognizes four main offenses under the Act namely; it is an offence to render food injurious to health (section 7); it is an offence to offer for sale, food which is unfit for human consumption or is contaminated (section 8); It is an offence to sell food not of the nature, quality or substance demanded by the purchaser (section 14); It is also an offence to falsely describe or present food (section 15) as itemized in Boella and Pannett (1999); Blanch (2003); Knowles, (2002); McLauchlin and Little (2007). Guidelines for ensuring adherence to these duties of care are prominently set out in the FSA (1990). Food business owners are put appropriate systems in place that will ensure the prevention of food contamination.

2.7.2 The contract of booking

In the hotel industry, the legally binding agreement between a ‘guest’ or customer and the hotelier (or restaurateur) for the provision of food and drinks and if so required, accommodation or some other services, is known as a ‘contract of booking’ (Boella and Pannett, 1999). The contract of booking just like any other contract, is primarily a civil matter and is subject to civil legal principles including the principle of due diligence. The hotelier (or restaurateur) owes his guests or customers a duty of care in the provision of meals. The contract that exists between the hotelier (or restaurateur) and the guest more often than not is the implied form of contract and by this, it is expected that the hotelier (or restaurateur) will exercise duty of care, due diligence and the neighbor principle in the provision of meals to
the guest or customer the breach of which will result to the ‘tort of negligence’ or ‘precarious liability’ where it is the employee that is directly responsible for the offence.

One of the most widely quoted and referred to food poisoning case and an example of the breach of neighbor principle is that of Donoghue v. Stevenson (1932). In the ruling of which Lord Atkinson declares persons who are so closely and directly affected by ones act (in this case the hotelier’s or restaurateur’s) as the hotelier’s (or restaurateur’s) neighbor, and to whom he/she owes a duty of care (Boella and Pannett, 1999).

2.7.3 Registration and licensing of food establishments

Food establishments are legally required to be registered and licensed. A food establishment is ‘any place where, or any vehicle in which, in the ordinary course of business, food is grown, raised, cultivated, kept, harvested, produced, manufactured, slaughtered, processed prepared, packaged, distributed, transported or sold, or is stored or handled for any of those purposes (Food Safety Act [SBC, 2002]). Such premises (in this case, the hotels) are expected to comply with legal requirements covering construction, occupational health and safety, and food hygiene and safety. These legal requirements are the prerequisites for obtaining licenses for any food establishment or premises (FRN, 1998; Tricket, 2001; McLauchlin and Little, 2007).

2.7.4 Responsibility to train and supervise food handlers

The Food Safety Act places a strong emphasis on owners and managers of food outlets to be responsible for instructing and providing training in food hygiene commensurate with their employees’ responsibilities. They are to supervise and ensure that all food handling
operations are carried out hygienically and that food handlers do not work if suffering from communicable diseases (Fosket and Ceserani, 2007 and Tricket, 2001).

2.7.5 Penalties

This is a measure by which the hospitality industry is constrained to meet its legal obligations for the supply of safe food. If convicted of a food safety related offence, courts have the power to impose varying amounts of fine and varying lengths of imprisonment terms for wrongs ranging from minor offences like obstructing officers in the course of their duties to serious offences such as selling food which is harmful to health. Where necessary, the court may order an outright closure of the food premises or require the food business owner to pay compensation to anyone who has suffered any form of injury by reason of the business owner’s actions or inactions. (Blanch, 2003 and FRN, 1998).

2.7.6 Legal defense and Due Diligence

On the other hand, in section 21 subsection 1 of the FSA (1990) the law also makes provision for legal defense for defaulters through the defense of due diligence. Due diligence is ‘a defense for the person charged to prove that he took all reasonable precautions …to avoid the commission of the offence by himself or by a person under his control’ (FSA, 1990, cited in McLauchlin and Little, 2007). A prosecuted business owner may establish a defense of due diligence if the person can prove that:

- The offence was the fault of another person,
- He or someone he trusted had carried out all the necessary checks, and that
- He had no reason to believe that his omission or action would amount to an offence (Blanch, 2003 and Tricket, 2001).

2.8 ETHICAL CONSIDERATIONS

Withney (1990) defines ethics as ‘knowing what ought to be done, and having the will to do it’, and due diligence according to Investorpedia (2010), ‘is a way of preventing unnecessary harm to either party involved in a transaction’. Judging ignorance to be the parent of most unethical judgments, Withney (1990) also made a clarification between ignorance and unethical behaviors. Whereas ignorance is lack of knowledge, unethical behaviors (or ethical strains) result when short-term opportunities to maximize profit come at the expense of long-term quality concerns. This is very evident where for example, hotels or restaurant managers are aware of the food hygiene and sanitation regulations’ requirements and expectations but for reasons best known to them, deliberately or unwittingly do not comply with such regulations’ requirements and expectations hence, the second objective of this study is to ascertain if hotel operators in Bauchi state are aware of the hygiene and sanitation guidelines guiding there operations and if they adhere to these.

The hotel industry is an integral part of the food supply chain which comprises of the food farmers, transporters, those who pack and store food, producers, manufacturers or processors and retailers. At each stage of the food supply chain, food safety is of paramount, incompromisable importance and each part of this chain is responsible for ensuring that this is achieved, by safe guarding this food safety, at their own levels (Eastham, Sharples and Ball, 2001). A hotel may shy away from this responsibility either out of complacency or total disregard.
As put forward by McLauchlin and Little (2007) and Fosket and Cecerani (2007), food hygiene is a continuum which comprises of several components majority of which are premises, personnel, raw food and equipment all of which must meet required and specified hygiene standards with equal efforts. Illustratively, if hotels are encouraged to comply with hygiene requirements regarding only cleanliness of premises and waste management but are not compelled to ensure the personal hygiene and fitness of the food handlers, or if the food handlers are not trained in or supervised to work hygienically, then food safety efforts become incomplete and ineffective. This is because a clean environment does not necessarily prevent a sick food handler from contaminating food, surfaces or infecting others which are all components of the hygiene continuum.

As a business organization, the hotel has a social responsibility towards all its stakeholders part of whom are the customers (Webley 1992, cited in Eastham et al, 2001). Defining business ethics as a ‘process of evaluating decisions, either pre or post with respect to the standards of the society’s culture…’ Webley (1992) analyses that the ripple impact of an organization spreads across its community and environment. Needless to say, the implications of a hotel’s unethical decisions and behaviors, specifically in food safety infractions, will eventually make their debuts in the life and well being of the very citizenry it is expected to protect and nurture through food. As pointed out by Eastham et al (2001:112) organizational best practices, in the form of ‘high standards and conducts are essential to a sound reputation, and the value of reputation is realized when conduct is compromised’. 
However, aside from ignorance and unethical behavior, McLauchlin and Little (2007) alerts that poverty in the developing countries can be an exacerbating factor in non adherence to, or improper implementation of food hygiene and safety rules and regulations possibly occasioned by lack of facilities for the hygienic preparation and storage of food.

2.9 SUMMARY OF REVIEWED LITERATURE

The hotel industry like any other industry is guided and regulated both legally and by its professional codes of ethics. As with any other law, enforcement of relevant food hygiene laws and regulations is imperative to ensure that all those concerned, comply. For this reason, the Federal Government of Nigeria has established different organs whose primary responsibilities are to ensure that public health is not compromised for any reasons. Results of most researches, for example Adediran, (2003); Dimfwina, (2004); Idowu, (2005) carried out especially on the food hygiene status of hotels in Bauchi indicate that hygiene levels are below acceptable standards. Until now, no study has been carried out focusing on the activities of the established relevant government regulatory and enforcement organs that are responsible for enforcing food hygiene regulations in Bauchi state. It is therefore not empirically verified if the regulatory agencies are actually performing their primary responsibilities or if their laxity is responsible for the reported incidences of hygiene infractions in the hotels. This study established if the regulatory agencies are efficient and effective in discharging their primary responsibilities of food hygiene law enforcement.
CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This section discusses the research design, the study area, target population, sampling procedure, sample size, data collection procedure and instruments, the pre-testing of the instruments and the data analysis procedure.

3.2 RESEARCH DESIGN

The study adapted the diagnostic survey design as a process of data collection in order to achieve the research objectives and to test the hypotheses. Diagnostic design as defined by Kothari (2004) is the type of study that determines the frequency with which something occurs or its association with something else. The study sought to determine the frequency of regulatory agencies supervision of hotels for hygiene and sanitation standard compliance and also, the relationship between these visits and the level of compliance of hotels to hygiene and sanitation regulations. For this study, the dependent variable was the compliance of hotels to sanitation regulations measurable in the observed output of the hygiene quality of food preparation environments while the independent variable was the enforcement of hygiene and sanitation laws by the regulatory agencies.

3.3 THE STUDY AREA

The study area was Bauchi Metropolis, which is the state administrative capital of, and bears the same name with the Bauchi State, situated in the north-east geographical zone of Nigeria. The target population is clustered within this area. Of the twenty-two local government areas
of Bauchi State, the Bauchi Metropolis was selected because being the state administrative capital, more business activities take place here and as such attract more visitors lodging in the hotels.

### 3.4 TARGET POPULATION

There are thirty-seven registered hotels in Bauchi classified as either International, National, Urban, Sub-urban, Rural, or Unclassified. Only one hotel fall under the International classification and one hotel under the National classification. Four hotels fall under the Urban classification, six hotels are Sub-urban classified, seven hotels are Rural classified and eighteen are Unclassified implying that these do not meet the minimum requirements for any form of classification (NTDC Bauchi, 2008).

The target population comprised two population groups. The first population group was of respondents drawn from the Urban and Sub-urban classified hotels in Bauchi. These hotels were selected because they were at the time of the study the relatively moderately priced hotels, which more guests patronize as compared with the International and National classified hotels. The second population group was of respondents drawn from the relevant regulatory agencies responsible for regulating the activities of and enforcing hygiene and sanitation in hotels in Bauchi state.

The Directorate of Pollution Control under the Bauchi State Environmental Protection Agency (BASEPA) was at the time of the study responsible for waste management, general sanitation and inspection of premises and enforcement of sanitation laws among other responsibilities. The Food and Food Premises Inspection unit of the Bauchi State Primary
Healthcare Development Agency (BSPHDA) was at the time of the study responsible for issuance of Certificates of Fitness to food handlers among its other responsibilities and ensuring that all food premises comply with the minimum standard of hygiene and sanitation. The most important function of relevance to this study of the Nigerian Tourism Development Board (NTDC) is the grading and classification of hotels, which is carried out by the Hotel Inspectorate Division of the Corporation.

3.5 SAMPLING PROCEDURE

According to Kothari, (2004) if a population is relatively small and all the respondents can be reached, then data can be collected from all of them without necessarily selecting a sample size from the population. Based on this, since the Urban and Sub-urban classified hotels in Bauchi metropolis were summed up to be only ten and all of them could be reached easily, three Urban and five Sub-urban classified hotels were used for the study while one each of the two categories was randomly selected to pre-test the research instrument for a more accurate data. In the same vein, since the relevant regulatory and enforcement agencies for this study are just three, all of them were used for the study.

Respondents from the hotels consisted of two strata. The first strata of hotels’ units’ heads comprised the General Manager, Operations/Food and Beverage Manager, Chef, Restaurant Manager and Storekeeper of each hotel and these summed up to be five unit heads per hotel. The reason for the choice of these respondents was that they were the administrative heads of the units which this research was concerned with, and who were responsible for maintaining sanitation standards in their different units.
The second strata comprised of five staff each from the production (cooks) and service (waiters) departments as a representative sample of all the staff in these departments, of each hotel. Their selection was random from among those who were physically present at work on the day the researcher went to administer the questionnaires and these also summed up to be ten production and service staff from each hotel. These were included because they are directly involved in the preparation, cooking and service of food and the state of their personal hygiene is emphasized for assessment in accordance with the Food Safety Act (1990) and the Nigeria National Environmental Health Practices Regulations of 2007 (Revised).

The regulatory and enforcement agencies respondents were the heads of operations of the three agencies responsible for enforcing hygiene and sanitation regulations in hotels. These are the BSPHDA, BASEPA and NTDC. By this only three respondents were involved in this population group. The number of respondents for the research thus totals one hundred and twenty-three.
Table 3.1: Summary of Target Population

<table>
<thead>
<tr>
<th>Population Group</th>
<th>Population</th>
<th>Respondents</th>
<th>Total</th>
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<tbody>
<tr>
<td>Hotels</td>
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<tr>
<td>Urban Classified hotels</td>
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<td>1 hotel manager</td>
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<td></td>
<td>1 operations manager</td>
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<td>1 chef</td>
<td>1 x 3 = 3</td>
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<td></td>
<td></td>
<td>1 restaurant manager</td>
<td>1 x 3 = 3</td>
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<tr>
<td></td>
<td></td>
<td>1 store keeper</td>
<td>1 x 3 = 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 kitchen staff</td>
<td>5 x 3 = 15</td>
</tr>
<tr>
<td>Sub-urban Classified hotels</td>
<td>5</td>
<td>1 hotel manager</td>
<td>1 x 5 = 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 operations manager</td>
<td>1 x 5 = 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 chef</td>
<td>1 x 5 = 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 restaurant manager</td>
<td>1 x 5 = 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 store keeper</td>
<td>1 x 5 = 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 kitchen staff</td>
<td>5 x 5 = 25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 restaurant staff</td>
<td>5 x 5 = 25</td>
</tr>
<tr>
<td>Regulatory Agencies</td>
<td>3</td>
<td>1 from each agency</td>
<td>3 x 1 = 3</td>
</tr>
<tr>
<td>Total respondents</td>
<td></td>
<td></td>
<td>123</td>
</tr>
</tbody>
</table>

3.6 Availability Pattern of Respondents

The study had projected to sample five units’ heads and ten production and service staff from each hotel to make a total of forty units’ heads and eighty production and service staff respondents from hotels. The researcher however discovered that not all the hotels have proper administrative structures and for which reason, only twenty-one units’ heads and forty-two production and service staff were available. However, all the three agencies’ heads were available for the study making a net total of sixty-six available respondents. This represents fifty-four percent of the projected respondents. This percentage has been justified acceptable by Kothari (2004); Mugenda and Mugenda (2003). Questionnaires were administered to and retrieved from all the sixty-six available respondents. Table 3.2 shows the breakdown of respondents’ availability.
### Table 3.2: Summary of Availability Pattern of Respondents

<table>
<thead>
<tr>
<th>Hotel code</th>
<th>Number of unit heads available</th>
<th>Number of food production and service staff available</th>
<th>Total number or respondents available</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>5</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>B</td>
<td>3</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>C</td>
<td>3</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>D</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>F</td>
<td>3</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>G</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>I</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>J</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Regulatory and enforcement Agencies</td>
<td>3</td>
<td>Not Applicable</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>24</td>
<td>42</td>
<td>66</td>
</tr>
</tbody>
</table>

#### 3.7 DATA COLLECTION INSTRUMENTS

Three semi-structured questionnaires were used to collect data from all the respondents of the two population groups. The first questionnaire was for the hotels’ unit heads (Appendix 1) while the second was for hotels’ food and beverage staff (Appendix 2) and the third was for the regulatory agencies (Appendix 3). The semi-structured questionnaires contained both closed-ended and open-ended questions. The closed-ended questions were easy to administer and analyze. Where in-depth responses were necessary, open-ended questions were used. Data was also collected using observation checklist and taking site photographs.

#### 3.7.1 Questionnaires

The questionnaires were developed based on the twenty-four items of assessment of hygiene and sanitation as specified in the FSA (1990). These are that:
1. All sections of the food premises are clean and maintained in good repair.

2. Layout, design, construction and size of the food premises is designed and built to ensure good hygiene.

3. All sanitary and hand washing facilities in the food premises are adequate and in good condition.

4. The food premises has wash basins with hot/cold running water and materials for drying hands.

5. There are separate facilities for washing food and for washing hands.

6. There are adequate ventilation facilities which are also accessible and suitable for cleaning.

7. All areas in the food premises has adequate lighting.

8. The food premises has adequate drainage in all the appropriate places.

9. There are enough changing facilities in the food premises.

10. All rooms’ floors, walls, ceiling and other surfaces maintained clean and disinfected.

11. There are enough facilities, tools, and equipment for cleaning purposes.

12. All utensils, fittings and equipment that can come into contact with food are made of materials that can be kept clean.

13. All equipment are moveable to ensure cleaning of surrounding areas.

14. All food and other wastes from the food premises are disposed of quickly to avoid accumulation.

15. All containers for food and other wastes can be closed, cleaned and disinfected.

16. All storage and waste disposal facilities are designed and built so that they are easily cleaned and are pets proof.

17. There is adequate supply of portable drinking water.

18. All ice consumed in the food premises are made from drinking water.

19. All staff handling food wear suitable, clean and appropriate protective clothing.

20. All staff handling food in the food premises are healthy, that is, free from any disease that can be transmitted through food.
21. The hotel never uses raw materials which are contaminated or are suspected of being contaminated.

22. All stages of food preparation are protected from being contaminated.

23. All food handlers in the food premises are closely supervised and are well trained in food hygiene to an appropriate level.

24. The food premises has facility for holding food at appropriate temperature before service.

3.7.1.1 Questionnaire for Hotels Units’ Heads

The questionnaire (Appendix 1) contained twenty questions eliciting information about the respondents’ academic qualification, the manner in which certain sanitation issues are being handled in the hotel (based on the FSA, 1990 requirement), information about any regulatory and enforcement agencies visits to the hotel and awareness of relevant food hygiene and sanitation laws.

3.7.1.2 Questionnaire for Hotels Food and Beverage Staff

This was a twenty-one item questionnaire (Appendix 2) used to collect information concerning the respondents’ academic qualification, the performance of both their employers and regulatory agencies’ responsibility as regards food hygiene and safety, and their awareness of food safety laws.

3.7.1.3 Questionnaire for Regulatory and Enforcement Agencies

This questionnaire (Appendix 3) contained sixteen questions targeted at getting information concerning the respondents’ academic qualification, the performance of their statutory
responsibilities and the agencies’ rating of the hotels’ compliance to food hygiene and sanitation laws.

3.7.2 Researcher’s Observation Checklist and Site Photographs

Observation checklist containing the twenty-four items of assessment of hygiene and sanitation as specified in the FSA (1990) was used to collect information on the state of affairs and sanitary working conditions of the hotels. Where possible, specific photographs of hotels’ premises and other necessary and relevant shots were taken. The researcher was able to take twenty-four (24) photographs. These are displayed in appendix 5.

3.8 PRE-TESTING OF THE INSTRUMENTS

For ethical purposes concerning confidentiality, all ten hotels used for this study were arranged alphabetically irrespective of their classifications and then coded as Hotel A, B, C, D, E, F, G, H, I, and J. One hotel each of the Urban and Sub-urban classified hotels were used to pre-test the questionnaires for validity and reliability. These hotels were the ones the researcher was able to without prejudice, access first. These happened to be hotel E (in the urban classified hotels category) and hotel H (in the sub-urban hotels category). Having administered the questionnaires, the researcher was able to discover loopholes and possible difficulties that can be encountered in the course of administering the questionnaires to other hotels. From the experiences gathered during the pre-resting, the researcher discovered that majority of the employees of the hotels were semi-literate whose abilities to read and comprehend were limited. It then became imperative that the researcher was physically present to administer the questionnaires so as to explain to those who require further
clarification (sometimes in the native language), what the contents of the questionnaire required of them.

### 3.9 DATA COLLECTION PROCEDURES

The questionnaires were researcher-administered to all the respondents while the premises observation was carried out personally by the researcher. A research permit was obtained both from the Kenyatta University, Kenya and the Federal Polytechnic Bauchi, Nigeria. This dual permit was necessary considering the fact that data was to be collected in Nigeria and the Federal Polytechnic Bauchi is both the researcher’s employer (who granted the researcher approval for the masters program) and also home institution. A letter of introduction was written to all participating hotels and agencies by the Federal Polytechnic Bauchi, explaining the researcher’s mission. For ethical reasons, the respondents were informed of the purpose and nature of the study.

### 3.10 DATA ANALYSIS

Both descriptive and inferential statistics were used to analyze quantitative data. After collection, data were edited, coded and organized into appropriate themes. These data were analyzed using the Statistical Package for Social Science (SPSS) version 17. The quantitative collected Data was described using measures of central dispersion and tendency, frequency distribution tables and percentages. These were used to achieve the three research objectives. One-way ANOVA was used to test for differences among the means of, and to analyze the total compliance scores of the eight hotels as regards all the 24 conditions of hygiene and sanitation that the regulatory agencies had scored them, based on a Likert scale with 5 points (5-Very Good, 4-Good, 3-Average, 2-Poor, and 1-Very Poor). A score between 24 and 56
implied low compliance, while a score between 57 and 89 implied average compliance and a score between 90 and 120 implied high compliance. Chi-square tests were used to establish relationship between dependent and independent variables and to test hypothesis 2. All the significant tests for the hypotheses were at 95% confidence level (p< 0.05).

3.10.2 Qualitative Data Analysis

Qualitative data was analyzed using the method prescribed by Mugenda and Mugenda, (2003) which include organizing the data, categorizing data into themes and patterns, analyzing and interpreting of information, and writing the report in an analytical and interpretative manner. The various methods used in analyzing the research objectives are presented in Table 3.3 while those for analyzing the research hypotheses are given in Table 3.4 below:
CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 INTRODUCTION

The findings on regulatory agencies effectiveness in enforcing compliance with hygiene regulations among urban and sub-urban classified hotels in Bauchi state, Nigeria are presented in this chapter. This chapter is divided into four sections. Section one deals with achieving the research objectives which were to assess the level of professional training held by both hotel operators and their food-handler employees, investigating if hotel operators and their food handler employees are aware of the hygiene and sanitation regulations which guide their operations in Bauchi State, determining the level of compliance of hotels in Bauchi State to hygiene and sanitation regulations as regards premises, equipment and personnel hygiene, and to find out if regulatory and enforcement agencies carry out their statutory role of enforcing compliance to hygiene and sanitation standards effectively.

Section two deals with testing of the two research hypotheses. Section three is an exploratory analysis of factors that contribute to hotels’ compliance with hygiene and sanitation requirements and section five is the findings of the researcher’s personal observations.

4.2.1 Respondents’ Professional Qualifications

The aim was to ascertain if the food handlers and their employers have any formal hospitality education or training which should serve as a basis for acquiring instructions in food hygiene and sanitation. It is assumed that every formal institution offering hospitality training will have this in its curriculum. This is confirmed in the NBTE syllabus. Being an open-ended
question, there were varied responses. For the purpose of analysis, these responses have been grouped into those that are actual hospitality courses and those that are of related fields such as food technology and tourism, and those that are neither hospitality nor of related fields as presented in Table 4.1.

**Table 4.1: Respondents’ Academic Qualifications**

<table>
<thead>
<tr>
<th>Professional Qualifications</th>
<th>Hotels’ units’ heads Freq.</th>
<th>Hotels’ units’ heads %</th>
<th>Production and Service Staff Freq.</th>
<th>Production and Service Staff %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher National Diploma (HND) Public Health management</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Post Graduate Diploma (PGD) Tourism Management</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Post Graduate Diploma (PGD) Hospitality Management</td>
<td>2</td>
<td>9.52</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>HND Hospitality Management</td>
<td>1</td>
<td>4.76</td>
<td>2</td>
<td>4.8</td>
</tr>
<tr>
<td>HND, Food Science and Technology</td>
<td>1</td>
<td>4.76</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Diploma, Hospitality</td>
<td>1</td>
<td>4.76</td>
<td>7</td>
<td>16.6</td>
</tr>
<tr>
<td>Diploma, Leisure and Tourism Management</td>
<td>1</td>
<td>4.76</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td>Certificate, Catering mgt</td>
<td>2</td>
<td>9.52</td>
<td>4</td>
<td>9.5</td>
</tr>
<tr>
<td>Qualifications in other fields (notably Diplomas)</td>
<td>8</td>
<td>38.11</td>
<td>9</td>
<td>21.45</td>
</tr>
<tr>
<td>Senior Secondary School Certificate</td>
<td>5</td>
<td>23.81</td>
<td>18</td>
<td>42.85</td>
</tr>
<tr>
<td>Primary School Certificate</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
<td>100</td>
<td>42</td>
<td>100</td>
</tr>
</tbody>
</table>

Data presented in Table 4.1 shows that a worrisome collective 61.92% and 66.7% of units’ heads and production/service staff respectively are non professionals working in the urban and sub-urban hotels in Bauchi state of Nigeria. Only 8 (38.11%) of the total units’ heads respondents had any formal training in hospitality, Food Science and Technology or tourism management. Others (61.89%) have training in either other unrelated fields or have just
secondary (and one primary) school formal education. Similarly, of the 42 production/service staff respondents, only 14 (33.3%) had formal training in hospitality and related fields.

The implication of this result is that those without formal professional education or training in hospitality may not be informed enough on hygiene requirements or hygiene best practices and these may be ignorant of the critical issues that surround food contamination or poisoning such as how bacteria multiply, conditions for bacterial growth, prevention of food poisoning, personal health and hygiene, and pest control among other critical food hygiene training areas. This poses as a hindrance to these staff in the performance of safe food production practices.

The respondents from the regulatory agencies have however obtained in relevant fields, at least the Higher National Diploma (HND) qualifications which are regarded as equivalents of a bachelor’s degree in Nigeria. Armed with these qualifications it is expected that these have adequate training and knowledge required for their hygiene inspection functions.

Interestingly, the researcher discovered that those units’ heads with the highest qualification in hospitality management are concentrated in the same hotel A as presented in Figure 4.1.
Figure 4.1: Percentage Distribution of Hotels' Units' Heads Professional Qualifications

The hotels’ units’ heads stratum is made up of the hotel manager, operations manager, chef, restaurant manager and store keeper of each of the eight hotels. In Nigeria presently, the Post Graduate Diploma is the highest professional qualification obtainable in hospitality management. Other qualifications in descending order are the Diploma, Advanced Certificate and Basic Certificate. As specified in the National Board for Technical Education (NBTE) syllabus, Diploma graduates are trained to be supervisors and HND graduates to be managers.

Figure 4.1 shows that only Hotel A has three (28.55%) personnel occupying supervisory and/or managerial positions who are in possession of relevant supervisory/managerial qualifications, with two units’ heads possessing Post Graduate Diploma in Hospitality, and
one (14.29%) with a Diploma in Hospitality Management. The only unit head in Hotel I has a
HND qualification in hospitality. Hotels C, F and B all have units’ heads having Diploma
qualifications in food Science and Technology, Tourism Management, and Hospitality
Management respectively.

Qualifications in Food Science and Technology and Tourism Management is considered by
this study as ‘related fields’ of study to hospitality in that Food Science encompasses food
hygiene, and students taking Tourism Management courses are mandated to take food
production courses in hospitality management where various aspects on food hygiene and
safety are also taught. As gathered from the data collected, Hotels D, G and J’s units’ heads
do not have any form of professional qualifications either in hospitality or in related fields.
Rather, these had qualifications in unrelated fields such as Diplomas in Business
Administration, Computer, Accounting, Agric and Extension, Insurance or possess just the
Senior Secondary School Certificate (Table 4.1).

Supervisors and managers of food businesses have legal obligations both to be trained and to
train food handlers in their food premises to appropriate levels (Knowles, 2002; Blanch,
2003; Fosket and Ceserani, 2007). The units’ heads are expected to set the tone for hygiene
good practices in their various units or departments, ensuring that hygiene rules are followed
strictly and that sanitation requirements are made available for their department staff.
However, data presented on Table 4.1 show that these legal obligations are not being fulfilled
by hotel operators in Bauchi and as such operational supervisors and managers in their hotels
can be described as unqualified for managerial/supervisory positions they occupy. This tally
with the survey by Mortlock et al (2000) and Worsfold and Griffith (2003) which shows that
less than one-fifth of the managers in the survey were trained to supervisory levels and that in most food businesses, refresher courses were neither planned nor implemented.

Likewise, the professional qualifications of the hotels’ production and service staff have been represented graphically on Figure 4.2.

![Figure 4.2: Percentage Distribution of Hotels’ Production/Service Staff Professional Qualifications](image)

**Figure 4.2: Percentage Distribution of Hotels’ Production/Service Staff Professional Qualifications**

Figure 4.2 shows that of the 14 staff respondents that had professional qualifications in hospitality (Table 4.1), Hotel A had the highest number of qualified food handlers, having two staff with HND, one with Diploma and one with Certificate in Hospitality Management qualifications. This was followed by hotels B and C with three qualified food handlers each and hotels D, G and I having only one qualified food handler each. Hotels F’s and J’s food
handlers did not possess any forms of professional qualifications. This negates Worsfold and Griffith (2003) observation that compliance with food hygiene regulations could be achieved by only engaging staff qualified in food hygiene among other observations.

It can be noted that in contrast to the impressive percentage of both qualified units’ heads and production/service staff of Hotel A, neither the units’ heads nor the production/service staff of hotel J has any professional qualifications. (Figures 4.1 and 4.2). This situation is considered to be of grave health consequences since it contradicts Knowles, (2002) recommendations that supervisors and managers who have direct influence on the hygienic operations of food businesses should have received qualifying training as a matter of good practice.

4.2.2 Hotel operators and food handlers’ awareness of hygiene and sanitation regulations

The purpose of this research objective was to ascertain if those managing the hotels and the food handlers they employ are cognizant of the food hygiene and sanitation regulations guiding their operations in Bauchi state as stipulated in the Food Safety Act of 1990 and the National Environmental Health Practice Regulations (NEHPR) (2007, Revised) of Nigeria. This stems from the fact that a person will only be conscious of the existence, importance and implications of what he or she is aware of. The hotel operators as well as the food handlers they employ are more likely to adhere to the contents of these Act and Regulations if they know that these exist, and they understand the contents.
In order to establish whether the hotel operators and the food handlers were aware of food hygiene and sanitation requirements guiding their operations, the respondents were enquired of their awareness of either the FSA (1990) or the NEHPR (2007) of Nigeria. This was required from the respondents in view of the fact that those who have any form of formal hospitality training in the Nigerian institutions would only be familiar with the FSA (1990) since no mention of the NEHPR (2007) was made in the syllabus. Nevertheless, hotel operators and food handlers would have been informed about the NEHPR during the process of enforcement.

In view of the reasons above, respondents from both the Hotels’ Units’ Heads and the Production/Service staff strata were asked if they were aware of either the FSA (1990) or NEHPR (2007). A total of 63 respondents comprising of 21 units’ heads and 42 food handlers responded to this question. The ‘Yes’ or ‘No’ responses of the respondents are presented in Figure 4.3.

![Figure 4.3: Heads and Staff Awareness of the FSA, (1990) or NEHPR (2007) of Nigeria.](image-url)
From the illustrated results in Figure 4.3, 14 out of 21 units’ heads and 29 out of the production/service staff respondents, representing 66.67% and 69% respectively are aware of the FSA but none of the respondents in the two strata has any knowledge about the NEHPR, (2007). However, an awareness of the FSA, (1990) is considered by this study to be sufficient in guiding hotel operators and food handlers in Bauchi on safe food production since the NEHPR is actually an adaptation of, and contains virtually all the requirements for safe food production as contained in the FSA.

Regulatory agencies have an obligation to enforce hygiene and sanitation laws on the hotel operators. Enforcement means to compel obedience to a law, regulation or command (Microsoft® Encarta®, 2008). Through the process of enforcement, it is expected that copies of any binding Regulations would be made available to the operators and their food handlers employees, and the contents therein brought to their notices.

For the above reasons, first the hotels’ units’ heads were asked if any regulatory agencies make available to them written health and sanitation guidelines or requirements. The response options were either ‘Yes’ or ‘No’. Data is presented on Figure 4.4.
All (100%) of the hotels’ units’ heads indicated they have never received any written health and sanitation guidelines or requirements from regulatory agencies.

By way of confirmation, the three regulatory agencies were requested if they make available written health and sanitation regulations and guidelines guiding hotel operators to them. They were required to tick either the ‘Yes’ or ‘No’ option. They were also requested to indicate the medium through which they communicate health and safety requirements and guidelines to the food operators. Their responses are as collated in Table 4.2.

Figure 4.4: Hotel operators ever received written sanitation guidelines from regulatory agencies

All (100%) of the hotels’ units’ heads indicated they have never received any written health and sanitation guidelines or requirements from regulatory agencies.
Table 4.2 Agencies making written sanitation requirements available to and medium of communication with hotel operators

<table>
<thead>
<tr>
<th>Written health and sanitation requirements or guidelines made available to hotel operators</th>
<th>How health and sanitation requirements are communicated to the hotel operators</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq.</td>
</tr>
<tr>
<td>Yes</td>
<td>0</td>
</tr>
<tr>
<td>No</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>3</td>
</tr>
</tbody>
</table>

The responses elicited from the regulatory agencies confirms hotels operators’ claim that none of the agencies makes available to them written health and sanitation requirements or guidelines. Two of the regulatory agencies reveal communicating health and sanitation requirements to the hotel operators verbally while one of them communicates through seminars and awareness campaigns. This is contradictory to Holt and Henson (2000) conclusions that it is essential for information to b transmitted in the most effective way possible especially by publication.

As required by FSA, (1990), all food handlers are to be given written and verbal instructions in the essentials of food hygiene before they start work (Blanch, 2003; Fosket and Ceserani, 2007; McLauchlin and Little, 2007). A written document gives the reader time to process and internalize the information. The unwritten medium of communicating health and sanitation requirements that exists between the regulatory agencies and the hotel operators as indicated on Table 4.2 above can be described as objectionable since without a written document to keep referring to, verbal instructions are subject to being overlooked, refuted or forgotten. Also, a verbalized document does not give room for critique, amendments or improvements.
of the supposed document content. It opens the hotel operators to misinterpretation of what is required of them which is in contrast to Holt and Henson (2000) and Blanch (2003) argument that food hygiene legislations be clear and devoid of misinterpretation.

Still trying to establish if hotel operators and food handlers are aware of the hygiene and sanitation responsibilities that they have, food and beverage production/service staff were asked if their employers conduct trainings for them as required by the FSA (1990) and the regularity of such trainings, if any. The results are presented in Table 4.3.

**Table 4.3: Employers conducting trainings for food handlers and the regularity of such trainings**

<table>
<thead>
<tr>
<th>Training Conducted</th>
<th>Freq.</th>
<th>%</th>
<th>Regularity of Training</th>
<th>Freq.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>16</td>
<td>38.1</td>
<td>Every 3 months</td>
<td>6</td>
<td>37.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Every 6 months</td>
<td>2</td>
<td>12.5</td>
</tr>
<tr>
<td>No</td>
<td>26</td>
<td>61.9</td>
<td>Every 9 months</td>
<td>4</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Every 12 months</td>
<td>4</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>100</td>
<td>Total</td>
<td>16</td>
<td>100</td>
</tr>
</tbody>
</table>

From Table 4.3, only 16 (38.1%) of the 42 food handlers responded in the affirmative that their employers do conduct hygiene training for them. Of this number, 6 (37.5%) get this training every three months. Two (12.5%) get the training every six months and 4 (25%) each get to be trained every 9 and 12 months respectively. This means that 26 (61%) of food handlers never get any hygiene training from their superiors. This is in disharmony with the FAS chapter X which states that the proprietors of a food business must ensure that the food handlers engaged in the food business are supervised and instructed or trained in food
hygiene matters commensurate with their work activities. The reason for this disharmony was explained by Worsfold and Griffith (2003) to stem from the fact that food hygiene issues were viewed in terms of aesthetics rather than food safety and that managers will take it serious only when something serious has gone wrong.

Also, the food handlers were asked to respond either ‘Yes’ or ‘No’ to the question of whether their employers or units’ heads make health and safety requirements available to them as well as indicate the regularity of such if any. The responses have been presented on Table 4.4.

**Table 4.4: Employers making health and safety requirements available to food handlers and the regularity of making such requirements available**

<table>
<thead>
<tr>
<th>Health/safety requirements made available</th>
<th>Regularity making health/safety requirements available</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq.</td>
</tr>
<tr>
<td>Yes</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
</tr>
</tbody>
</table>

Data presented above shows that only a meager 11 (or 26.2%) of the food handlers ever have their units’ heads or employers make available to them, hygiene and safety requirements. Out
of this number, seven indicate that the requirements are made available to them every 3 months, six indicated every 6 months and one indicated a regularity of every nine months. This is conclusive evidence that the FSA (1990) obligation for employers to make health and safety requirements available to food handlers is being flaunted. This means that food handlers are grossly ignorant of their hygiene and sanitation commissions meaning also that they are not be keen about observing what they do not know about, creating a laissez faire attitude towards hygiene and sanitation practices. Regularly making these hygiene and safety requirements available to staff is a way of establishing the organizational hygiene best practices, a culture which if uncompromised, upholds an organization’s reputation as pointed out by Eastham et al. (2001).

**Level of Compliance of Hotels in Bauchi State to Hygiene and Sanitation Regulations.**

In order to achieve this objective, the three regulatory agencies were asked to give their ratings of how the eight hotels fair in complying with the twenty-four items of the food hygiene and sanitation requirements listed. Their ratings were based on a Likert scale of 1 to 5. The lowest value of 1 was allotted to ‘very poor’, 2- ‘poor’, 3-‘average’, 4-‘good’ and the highest value of 5 was assigned ‘very good’.

Descriptive statistics were used to cross-tab between compliance scores of the hotels and the agencies’ ratings of the 24 hygiene and sanitation requirements listed. The average score was 74.25. Since the highest score possible was 120, and the lowest score possible was 24, levels of compliance are thus computed;

- A score between 24 and 56 connotes Low Compliance
- A score between 57 and 89 connotes average compliance and
- A score between 90 and 120 connotes high compliance
Figures 4.5 and 4.6 respectively represent the comprehensive and abridged results of hotel’s levels of compliance with hygiene and sanitation regulations in Bauchi.

Figure 4.5: Regulatory agencies’ rating of hotels’ compliance with food safety regulations in Bauchi
Figure 4.6: Abridged result of the regulatory agencies’ rating of hotels’ compliance with hygiene and sanitation regulations

A disturbing 75% of the eight hotels were rated to be performing below average in terms of compliance to food hygiene and sanitation regulations. Only one hotel (12.5%) was rated to be complying averagely and only one (12.5%) hotel also was rated to have high compliance performance.

The three regulatory agencies were also requested to assess the eight hotels’ hygiene and sanitation status as either ‘satisfactory’ or ‘not-satisfactory’. Figure 4.7 represents regulatory agencies’ assessment of the hotels’ hygiene and sanitation status in Bauchi.
Of the three regulatory agencies, only one (33.3%) is of the opinion that the hotels’ hygiene and sanitation status is satisfactory. The two other agencies’ verdict is that the hotels’ hygiene and sanitation status is not satisfactory. This result is of immense health significance and implication because this result can be taken to infer that food operations in these hotels are done unhygienically and under unhygienic conditions. The result also imply that the consumer health is at risk and that a food-borne disease outbreak is a disaster waiting to happen, a situation which calls for urgent remedial actions.

This result however, cannot be far removed from the upshots of hotels’ operators’ presupposed ignorance of the hygiene and sanitation requirements that exist to guide their food operations. This shows inevitably that the hotel operators will not comply with what they are not aware of.
4.3.3 Status of regulatory and enforcement agencies in effectively carrying out their statutory role of enforcing compliance to hygiene and sanitation standards.

First the regulatory agencies were asked to enumerate their primary functions. For the purpose of analysis, the regulatory agencies have been coded as agency A, B and C respectively.

The responses given are summarized in Table 4.5.

**Table 4.5: Regulatory Agencies’ Primary functions**

<table>
<thead>
<tr>
<th>Regulatory Agency</th>
<th>Primary Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Protect and conserve the environment, through environmental sanitation and waste management.</td>
</tr>
<tr>
<td>B</td>
<td>Public health/hotels inspection, control of diseases.</td>
</tr>
<tr>
<td>C</td>
<td>Tourism promotion, development and marketing, hotels inspection and classification.</td>
</tr>
</tbody>
</table>

Having established their individual functions, the regulatory agencies were requested to state if they are able to perform their primary functions as scheduled. In Figure 4.8 is the responses elicited.
Only one of the agencies (33.3%) claimed to be doing its job as scheduled. The other two agencies confessed of their not being able to carry out their duties as expected. Responding to an open ended question of the possible impediments which prevent them from carrying out their duties as expected, the two agencies which confessed not being able to carry out duties effectively blamed insufficient funds, manpower and logistics for their incapability. These form part of those impediments listed by Subratty, Beeharry and Chan Sun (2004) challenging regulatory and enforcement agencies’ effective performances.

For enforcement to be possible and effective, it requires that the agencies’ officials physically pay inspection visits to the food premises both to assess and to ensure that hygiene and sanitation rules are followed as provided for in the FSA (1990). For this reason, the hotels’ units’ heads and production/service staff were asked if any agencies come to inspect their food premises (Figure 4.9).
All 21 (100%) of the units’ heads but only 13 (31%) of the food and beverage staff acknowledge that regulatory agencies do pay them inspection visits. They however indicated which of the agencies do pay them inspection visits as presented in Figure 4.10.
From the response enumerated in Figure 4.10, none of the units’ heads or the production/service staff have indicated that all three agencies paid their food premises inspection visits. Rather, they had been receiving inspection visits from either one or a combination of two of the agencies. It can be observed however that agency A is more regular with inspection visitations with 52.38% and 42.9% of the units’ heads and production/service staff respectively acknowledging having received inspection visit from it.

As mentioned earlier, enforcement is only most effective when the agencies pay inspection visits to the food premises. As elicited from the three agencies and presented in Table 4.5, each of the three regulatory agencies had different areas of inspection jurisdiction. For instance, Agency A is more concerned with premises sanitation and waste management (BASEPA, 1997) while Agency B is more concerned with health matters (NEHPR, 2007) and Agency C’s main assignment is to grade and classify hotels based on compliance with certain specific criteria as laid down by the Agency (FRN, 1992).

The result shown in Figure 4.10 indicates that none of the hotels has ever received inspection visits from all three regulatory agencies. Rather, the hotels have at separate times been inspected by a maximum of two of the three agencies. It is expected that the area of jurisdiction of the agencies which does not pay regular visits to the hotels will be neglected both during inspection visits by the individual visiting agency and by the hotels, with a tendency resulting in slackness in maintenance of hygiene standards in those particular areas.

This result also brings to the fore, a perceived shortcoming in the multi-strata or multi-agency system adopted in the food safety inspection and enforcement procedure adopted in Nigeria.
As observed by Bowman and Russell (2001) food safety efforts must not be directed at only one point of the food safety continuum hence the need for a unilateral regulatory agency (Holt and Henson, 2000).

Both the FSA (1990) and the NEHPR (2007) suggest that inspections be carried out at regular intervals. This apparently is to ensure that the hotels do not lax in maintaining hygiene standards. This study thus inquired about how often the regulatory agencies pay the food premises inspection visits, the responses presented in Table 4.6 reflects the visitation pattern.

### Table 4.6: Regularity of Agencies’ Inspection Visits

<table>
<thead>
<tr>
<th>Regularity of Agencies’ Inspection Visits to the Food Premises</th>
<th>Units’ Heads</th>
<th>F and B Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq.</td>
<td>%</td>
</tr>
<tr>
<td>Every month</td>
<td>2</td>
<td>9.52</td>
</tr>
<tr>
<td>Every Three Months</td>
<td>2</td>
<td>9.52</td>
</tr>
<tr>
<td>Every Six Months</td>
<td>14</td>
<td>66.67</td>
</tr>
<tr>
<td>Every Nine Months</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Every Twelve Months</td>
<td>2</td>
<td>9.52</td>
</tr>
<tr>
<td>Two Years ago</td>
<td>1</td>
<td>4.77</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
<td>100</td>
</tr>
</tbody>
</table>

From Table 4.6, it can be agreed that the most frequent interval of regulatory agencies’ inspection is six months. Fourteen respondents (66.67%) and 6 (42.9%) of the units’ heads and production/service staff, respectively, make up the highest frequencies of the data. Even though both the FSA (1990) and the NEHPR (2007) suggest that inspections be carried out at
regular intervals, this does not specify how regular the interval should be. However, the preponderant six months inspection interval as observed in Table 4.6 can be adjudged as insufficient and capable of being ineffective in ensuring a sustained acceptable hygiene standard. This is confirmed by the hotels’ general ‘Not satisfactory’ hygiene evaluation as presented in Figure 4.7.

Having established that the regulatory agencies sometimes carry out inspection visits, the study sought to find out the effectiveness of such visitations to the food premises. The effectiveness of the inspections was measured by asking units’ heads and production/service staff about which of areas of the twenty-four hygiene and sanitation aspects the agencies are always particular about during their inspection visits. It is expected that if the agencies pay particular attention to and emphasis certain hygiene and sanitation aspects, it will make the hotel operators realize how important those areas are and make them most likely comply with these hygiene and sanitation aspects.

Respondents were requested to write either ‘Y’ for Yes in the boxes besides the aspects that the regulatory agencies are particular about or ‘N’ for No in the boxes which they are not particular about. A combination of the twenty-one units’ heads and thirteen production/service staff who had affirmed that the agencies do come for inspection, (as shown in Figure 4.9) gives the total of thirty-four (34) respondents who responded to this question and the responses elicited from them is presented in Table 4.7.
Table 4.7: Comparative analysis of the various aspects of hygiene and sanitation emphasized on by regulatory agencies during inspection visits

<table>
<thead>
<tr>
<th>Aspect of Hygiene and Sanitation</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleanliness of premises</td>
<td>28</td>
<td>6</td>
<td>34</td>
</tr>
<tr>
<td>Maintenance of premises</td>
<td>26</td>
<td>8</td>
<td>34</td>
</tr>
<tr>
<td>Availability of hand washing facilities</td>
<td>16</td>
<td>18</td>
<td>34</td>
</tr>
<tr>
<td>Availability and location of toilets</td>
<td>8</td>
<td>26</td>
<td>34</td>
</tr>
<tr>
<td>Availability of wash basins with hot and cold running water separate from facilities for washing food</td>
<td>6</td>
<td>28</td>
<td>34</td>
</tr>
<tr>
<td>Separate facilities for washing food and for washing hand</td>
<td>3</td>
<td>31</td>
<td>34</td>
</tr>
<tr>
<td>Adequate ventilation</td>
<td>16</td>
<td>18</td>
<td>34</td>
</tr>
<tr>
<td>Adequate lighting</td>
<td>8</td>
<td>26</td>
<td>34</td>
</tr>
<tr>
<td>Adequate drainage</td>
<td>6</td>
<td>28</td>
<td>34</td>
</tr>
<tr>
<td>Availability of changing facility</td>
<td>9</td>
<td>25</td>
<td>34</td>
</tr>
<tr>
<td>Cleanliness of floors, walls, ceilings and other surfaces</td>
<td>28</td>
<td>6</td>
<td>34</td>
</tr>
<tr>
<td>Enough facilities, tools and equipment for cleaning purposes</td>
<td>6</td>
<td>28</td>
<td>34</td>
</tr>
<tr>
<td>All equipment are moveable to ensure cleaning of surrounding areas</td>
<td>7</td>
<td>27</td>
<td>34</td>
</tr>
<tr>
<td>Types of materials cooking and service equipment are made from</td>
<td>8</td>
<td>26</td>
<td>34</td>
</tr>
<tr>
<td>Immediate waste disposal to avoid accumulation.</td>
<td>23</td>
<td>11</td>
<td>34</td>
</tr>
<tr>
<td>Containers for food and other wastes are cleanable and pest proof</td>
<td>9</td>
<td>25</td>
<td>34</td>
</tr>
<tr>
<td>Arrangement of work flow</td>
<td>5</td>
<td>29</td>
<td>34</td>
</tr>
<tr>
<td>Adequate water supply</td>
<td>30</td>
<td>4</td>
<td>34</td>
</tr>
<tr>
<td>Staff uniforms</td>
<td>9</td>
<td>25</td>
<td>34</td>
</tr>
<tr>
<td>Staff general health</td>
<td>10</td>
<td>24</td>
<td>34</td>
</tr>
<tr>
<td>Types of food raw materials used</td>
<td>9</td>
<td>25</td>
<td>34</td>
</tr>
<tr>
<td>Food storage</td>
<td>8</td>
<td>26</td>
<td>34</td>
</tr>
<tr>
<td>Staff training on hygiene</td>
<td>9</td>
<td>25</td>
<td>34</td>
</tr>
<tr>
<td>Methods and means of food temperature control</td>
<td>5</td>
<td>29</td>
<td>34</td>
</tr>
</tbody>
</table>
The result in the Table 4.7 above shows the areas of effectiveness of the regulatory agencies that visit the food premises for inspection as well as give a pointer to the particular agency that is more faithful in the area of inspection with regards to their mandate. For the purpose of interpretation, the researcher picked a response of 50% and above (that is response frequency of 17 and above) to be an indication that that particular condition of hygiene and sanitation is being effectively emphasized by the regulatory agencies during inspection visitations. For this reason, the conditions of hygiene and sanitation considered to be effectively emphasized are being extracted from Table 4.7 to compile Table 4.8.

**Table 4.8: Summary of Conditions of Hygiene and Sanitation Mostly Emphasized-on During Inspection Visits by Regulatory Agencies**

<table>
<thead>
<tr>
<th>Hygiene and Sanitation Conditions</th>
<th>Yes</th>
<th></th>
<th>No</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq. (N=34)</td>
<td>%</td>
<td>Freq. (N=34)</td>
<td>%</td>
<td>Freq. (N=34)</td>
<td>%</td>
</tr>
<tr>
<td>Cleanliness of premises</td>
<td>28</td>
<td>82.4</td>
<td>6</td>
<td>17.6</td>
<td>34</td>
<td>100</td>
</tr>
<tr>
<td>Maintenance of premises</td>
<td>26</td>
<td>76.5</td>
<td>8</td>
<td>23.5</td>
<td>34</td>
<td>100</td>
</tr>
<tr>
<td>Cleanliness of floors, walls, ceilings and other surfaces</td>
<td>28</td>
<td>82.4</td>
<td>6</td>
<td>17.6</td>
<td>34</td>
<td>100</td>
</tr>
<tr>
<td>Immediate waste disposal to avoid accumulation.</td>
<td>23</td>
<td>67.6</td>
<td>11</td>
<td>32.4</td>
<td>34</td>
<td>100</td>
</tr>
<tr>
<td>Adequate water supply</td>
<td>30</td>
<td>88.2</td>
<td>4</td>
<td>11.8</td>
<td>34</td>
<td>100</td>
</tr>
</tbody>
</table>

The abridged Table 4.8 shows that only five conditions of hygiene and sanitation (cleanliness of premises; maintenance of premises; cleanliness of floors, walls, ceilings and other surfaces; immediate disposal to avoid accumulation of waste and adequate water supply) were being effectively emphasized by the regulatory agencies that pay inspection visits to the hotels. A critical look at these conditions of hygiene and sanitation which are being
effectively emphasized points to those that fall within the ambit of one particular agency which deals with environmental sanitation and waste management (see Table 4.5 above).

An important indication of the effectiveness of one of the regulatory agencies is the certification of food handlers that is, food handlers being issued with Certificates of Fitness. This is done after the food handler has gone through thorough medical examination and has been found not to be suffering from any form of communicable diseases. To ascertain if this agency that is responsible for public health/hotels inspection and control of diseases (see Table 4.5 above) is effective enough, all 42 food handlers were requested to indicate if they possess any Certificates of Fitness. The ‘Yes’ or ‘No’ responses are shown below in Figure 4.11:

**Figure 4.11: Food Handlers That Possess Certificates of Fitness.**
Of the 42 food handlers involved in this study, only 5 (11.9%) claimed to have Certificates of Fitness. An overwhelming 88.1% were handling food meant for public consumption and working with other people without their health status examined or certified fit. Similar study conducted by Subratty, Beeharry and Chan Sun (2004) shows that of the fifty food handlers that participated in the study, 10% of them were in possession of invalid certificates. This can be concluded as did Subratty, Beeharry and Chan Sun (2004) to mean that the regulatory agency in charge of ensuring food handlers’ fitness for work in food processing establishments is ineffective in carrying out its obligations.

Based on the data presented in and the significance of Tables 4.7 and 4.8 and Figure 4.11, the research conceptual framework postulated for this study that enforcement of food hygiene regulations will ensure compliance which in turn leads to hygiene and sanitation good practices resulting in safe food production is established. This is also in agreement with Knowles’s (2002) observation of the overriding effect of enforcement on compliance experienced in the UK after the introduction of the FSA (1990).

### 4.6.1 Findings of the Researcher’s Personal Observations

In order to have firsthand information about the hotels’ hygiene state of affairs, the researcher conducted a personal survey of the facilities available at the hotels using the FSA, (1990) as a guide. The researcher’s observation checklist had the same 24 items as contained in the regulatory agencies’ questionnaire used to assess the hotels for compliance. Concerning each hotel, the researcher indicated ‘Yes’ against the requirement that is fulfilled and ‘No’ against the requirement that was not fulfilled. The researcher’s observations are catalogued in Table 4.14. Also the researcher took photographs of the food premises. For ease of reference, each
photograph (referred to as Plate) has been numbered using an uppercase alphabet and serial numbers. The uppercase alphabets have been used to indicate the hotel code. For example, Plate J-001 means that the photograph was taken at hotel J and the photograph’s serial number is 001 (Appendix 5).
### Table 4.15: Researcher’s Observation of the Hotels’ Hygiene and Sanitation Condition

<table>
<thead>
<tr>
<th>Hygiene and Sanitation Requirements</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq.</td>
<td>%</td>
</tr>
<tr>
<td>All sections of the food premises are clean and maintained in good repair</td>
<td>8</td>
<td>100</td>
</tr>
<tr>
<td>Layout, design, construction and size of the food premises is designed and built to ensure good hygiene.</td>
<td>3</td>
<td>37.5</td>
</tr>
<tr>
<td>All sanitary and hand washing facilities in the food premises are adequate and in good condition.</td>
<td>3</td>
<td>37.5</td>
</tr>
<tr>
<td>The food premises has wash basins with hot/cold running water and materials for drying hands.</td>
<td>1</td>
<td>12.5</td>
</tr>
<tr>
<td>There are separate facilities for washing food and for washing hands.</td>
<td>1</td>
<td>12.5</td>
</tr>
<tr>
<td>There are adequate ventilation facilities which are also accessible and suitable for cleaning.</td>
<td>4</td>
<td>50</td>
</tr>
<tr>
<td>All areas in the food premises has adequate lighting.</td>
<td>4</td>
<td>50</td>
</tr>
<tr>
<td>The food premises has adequate drainage in all the appropriate places.</td>
<td>1</td>
<td>12.5</td>
</tr>
<tr>
<td>All rooms: floors, walls, ceiling and other surfaces maintained clean and disinfected.</td>
<td>4</td>
<td>50</td>
</tr>
<tr>
<td>There are enough changing facilities in the food premises.</td>
<td>1</td>
<td>12.5</td>
</tr>
<tr>
<td>There are enough facilities, tools, and equipment for cleaning purposes.</td>
<td>6</td>
<td>75</td>
</tr>
<tr>
<td>All utensils, fittings and equipment that can come into contact with food are made of materials that can be kept clean.</td>
<td>8</td>
<td>100</td>
</tr>
<tr>
<td>All equipment are moveable to ensure cleaning of surrounding areas.</td>
<td>4</td>
<td>50</td>
</tr>
<tr>
<td>All food and other wastes from the food premises are disposed of quickly to avoid accumulation.</td>
<td>5</td>
<td>62.5</td>
</tr>
<tr>
<td>All containers for food and other wastes can be closed, cleaned and disinfected.</td>
<td>2</td>
<td>25</td>
</tr>
<tr>
<td>All storage and waste disposal facilities are designed and built so that they are easily cleaned and are pets proof.</td>
<td>2</td>
<td>25</td>
</tr>
<tr>
<td>There is adequate supply of portable drinking water.</td>
<td>7</td>
<td>87.5</td>
</tr>
<tr>
<td>All ice consumed in the food premises are made from drinking water.</td>
<td>1</td>
<td>12.5</td>
</tr>
<tr>
<td>All staff handling food wear suitable, clean and appropriate protective clothing.</td>
<td>2</td>
<td>25</td>
</tr>
<tr>
<td>All staff handling food in the food premises are healthy, that is, free from any disease that can be transmitted through food.</td>
<td>8</td>
<td>100</td>
</tr>
<tr>
<td>The hotel never uses raw materials which are contaminated or are suspected of being contaminated.</td>
<td>8</td>
<td>100</td>
</tr>
<tr>
<td>All stages of food preparation are protected from being contaminated.</td>
<td>1</td>
<td>12.5</td>
</tr>
<tr>
<td>All food handlers in the food premises are closely supervised and are well trained in food hygiene to an appropriate level</td>
<td>1</td>
<td>12.5</td>
</tr>
<tr>
<td>The food premises has facility for holding food at appropriate temperature before service.</td>
<td>1</td>
<td>12.5</td>
</tr>
</tbody>
</table>
For a food premises to be considered hygienic and food processed therein as safe, it is necessary that such premises complies with all hygiene and sanitation aspects of the FSA. This is because each and every aspect is an integral part of the food hygiene and safety whole frame. A default in one aspect of the whole frame has the tendency to jeopardize efforts on other aspects as well as make worthless, all erstwhile and perceived food hygiene gains. As compiled in Table 4.14, the items of the checklist to which at least 50% of the hotels have been found to have complied with have been highlighted in green color while those not found to have been complied with by at least 50% of the hotels have been highlighted in red color. Table 4.14 shows that at least half of the eight hotels have complied with only eleven items on the checklist as observed by the researcher. These observations have been assayed as follows;

4.6.2 Itemized Assay of the Hygiene and Sanitation Requirements Based on the Researcher’s Personal Observation in Table 4.15.

All sections of the food premises are clean and maintained in good repair;

As presented on Table 4.15, the researcher observed that all of the eight hotels (100 %) had their premise kept cleaned that is, swept with no noticeable repulsive filthiness as prescribed by Mohini, (2004). This can be observed from plates A-014, A-015, J-016 and F-017 (Appendix 5).

Layout, design, construction and size of the food premises is designed and built to ensure good hygiene;

Food premises’ design, layout and size as proposed by Birchfield (2008) and Mohini (2004) should be large enough to accommodate all materials and equipment, allow for free movement of people and goods, prevent contact between high-risk and other foods, and
incorporate a well defined work flow among other considerations. The data entry on Table 4.14 shows that only 3 hotels have the size of their food premises built in such a manner that staff have enough space to move about freely, have equipment arranged with a definite flow and have a layout that reduces the risk of cross-contamination. One of the well lay out and spacious food premises can be observe from Plates A-014 and A-018 while Plates J-002, C006, F-009 and B-012 are examples of non-spacious and poorly laid out food premises. The hotels that did not comply with this requirement encouraged unhygienic practices as warned by Blanch (2003).

All sanitary and hand washing facilities in the food premises are adequate and good condition;

This is recommended recognizing the fact that the food handler’s hands come into contact with wastes discharged from the body such as feces and urine. Theses contain pathogenic microbes which contaminates anything touched before the hands are washed. For this reason, McLauchlin and Little (2007) recommends that sanitary and hand washing facilities are placed adjacent to the toilet cubicles. Only 3 (37.5%) of the hotels visited had complied with this requirement.

The researcher’s survey revealed that five of the hotels’ staff toilets either did not have the hand washing facilities or the facilities are in states of disrepair and as such the food handlers wash their hands in the sinks in the kitchen when they come back from the toilet. This is a grievous health risk especially in the event that any of the food handlers is suffering from diarrhea related infections. That means the food and surfaces in the food area risk being contaminated.
The food premises has wash basins with hot/cold running water and materials for drying hands and There are separate facilities for washing food and for washing hands; Stemming from the fact that the hands are used extensively to touch and hold things including raw food (which may contain mud and dust), soaps or even poisonous items such as rat poisons, it behooves that the food handler washes hands in separate sinks from that used for the washing of food. Only one out of the eight hotels had complied with these requirements evidenced in plate A-022. This means in other hotels, hands were washed unto food and in the process contaminants transferred unto the food, or into the sink used for washing food which eventually contaminate the food that may be washed therein. This is in contrary to Blanch, (2003) recommendation for the prevention of bacterial and cross contamination.

There are adequate ventilation facilities which are also accessible and suitable for cleaning and all areas in the food premises have adequate lighting; Ventilation mechanisms are means of extracting fumes, odor and stale air which is necessary for preventing water vapor from condensing and creating moisture that drip from ceilings or run down walls, as well as reduce the buildup of heat and odor. The ventilation mechanisms could either be natural or mechanical as suggested by McLauchlin and Little, (2007).

Four hotels each were observed to have complied with these requirements. Plates A-014, A-015, J-016 and F-017 are examples of food premises with relatively adequate ventilation and lighting. Plates J-002 and F-009 portray examples of the food facilities which have inadequate ventilations and inadequate lighting (as evidenced by the dark images on the Plates). The researcher observed that these hotels have neither windows at opposite directions which could facilitate cross ventilation nor extractor fans for the exhausting of smoke and
stale air. Considering the intense heat generated in food preparation areas couple with the high atmospheric temperatures of northern Nigeria, there is likelihood of water vapor condensation which may drip from ceilings and walls unto worktops, surfaces and food, causing contaminations.

*The food premises has adequate drainage in all the appropriate places*;

The necessity for drainages is to provide channels through which liquid wastes leave the food preparation area. These are recommended by McLauchlin and Little, (2007) to be provided around equipment and items of equipment such as potato peelers. Only one (12.5%) of the hotels has drainages in appropriate places as proofed in Plate A-019. Not only does hotel C not have drainages in appropriate places but even the sinks’ pipes that should convey water away from the sinks are in states of disrepair necessitating drippings from the sink to be collected with buckets as shown in Plate C-004. Wastes water left to accumulate or stagnate in the food preparation area has capability to cause offensive odor, provide breeding space for varmints and cause accidents through slips.

*There are enough changing facilities in the food premises*;

Also only one (12.5%) of the hotels has a changing facility designated for staff. All others did not have. This may be attributed to the fact that in most of the hotels, food handlers perform their duties wearing their home cloths.

*All rooms’ floors, walls, ceiling and other surfaces maintained clean and disinfected*;

This is true of only four (50%) of the food premises an example can be observed in Plate I-003 with walls that appear pristine. The other four food premises’ walls or ceilings or surfaces were in obvious states of dilapidation. For example, plate C-007 shows the ceiling of
one of the food premises whose paints are peeling off, ready to fall (unto food). Plates J-003 and B-012 show walls that appear derelict. This is a situation that makes the food premises microbes prone just as McLauchlin and Little, (2007) noted that the accumulation of dirt on walls, ceilings and surfaces undermines food hygiene as these dirt harbor food contaminating microbes and can easily get unto the food being processed as is very obvious from Plate C-007.

There are enough facilities, tools, and equipment for cleaning purposes;

The purpose of separating and ensuring proper designation of cleaning materials such as buckets, towels and bowls from those used in food preparation is to ensure that these are not mistaken for each other. Six (75%) of the food premises provided evidences of having enough materials for cleaning purposes which they claim they do not use for any other purposes. This ensures that whatever is cleaned away from the food area is not transferred back into the food. Two of the premises have items of cleaning but the workers were neither able to convince the researcher that the same items were not being used for food preparation nor show those used separately for food preparation.

All utensils, fittings and equipment that can come into contact with food are made of materials that can be kept clean;

The researcher observed that all the food premises (100%) complied with this requirement. This is so since in the Nigerian market, the federal government’s relevant agency, (the Standard Organization of Nigeria) ensures that all cooking materials sold in the market are made of materials that can be kept clean.
All equipment are moveable to ensure cleaning of surrounding areas;

Industrial cooking equipment such as are used in the hotels are often large and heavy because of the volume of cooking that take place. During the process of cooking however, food and other particles drop off around and especially behind these equipment and due to the size and weight of these equipment, the dropped off particles cannot be easily reached and removed. These then become centre attractions and safe havens for micro-organisms, varmints, pests and rodents. Appropriate equipment arrangement has been identified by Knowles, (2002) and McLauchlin and Little, (2007) as means of ensuring that no rubbish is left behind equipment thereby making certain that thorough cleaning has been carried out.

The assessment of food premises carried out by the researcher reveals that only one (12.5%) of the hotels has adopted a suitable style of equipment arrangement which allows for the surroundings of the equipment to be swept, cleaned or mopped (plate A-021). All other hotels’ equipment were fixed to the wall and did not have any room for them to be moved away from where they have been attached or fixed. This means that cleaning was not being carried out satisfactorily and the likelihood of the presence of rodents in these food premises could not be ruled out which in itself is a threat to food safety.

All food and other wastes from the food premises are disposed of quickly to avoid accumulation;

The accumulation of wastes in food areas are according to McLauchlin and Little (2007) and Fosket and Ceserani (2007), attracts and serves as a breeding ground for rodents, pests and flies, as well as stimulus for accidents, contaminations, unpleasant odors, fire hazard and pollution, hence the requisite for immediate waste clearing and proper management.
On the days the researcher visited these food premises, five (62.5%) of the premises showed compliance with this requirement and the researcher assumed this is a regular practice. Garbage was noticed to be accumulated in three of the food premises as this can be seen on Plate F-024 where the garbage bin was noticed to be filled and full to over flowing and on Plate G-023 where garbage collected is in an exposed container. Plate J-001 shows garbage from the kitchen being piled and burnt right in the front of the kitchen. This action not only makes the food premises unsightly, but also indicates lack of proper waste management, which poses health and hygiene hazards as the smoke from the fire finds its way into the food area, thereby settling on food, equipment and surfaces.

*All containers for food and other wastes can be closed, cleaned and disinfected and All storage and waste disposal facilities are designed and built so that they are easily cleaned and are pets proof*;

Containers for food and other wastes are required to be such that can be closed, cleaned and pest proof so that they do not become breeding grounds especially for pests. This is thus recommended considering the fact that pests (rodents, insects, birds) cause damage to food and building, introduce pathogens into food, contaminate food products by means of their bodies or body parts, furs, eggs and droppings and are a potential source of infections as postulated by Blanch (2003) and McLauchlin and Little (2007).

Closed, cleaned and disinfected waste containers repel pests thereby subsequently reducing the chances of pests’ infestation. Researcher’s observations presented in Table 4.15 shows that only 2 (25%) of the food premises comply with this requirement. Other food premises either collect their wastes in baskets or cartons such as is displayed on Plate G-023, exposing the waste to pest invasion and the food premises to pest infestation.
There is adequate supply of portable drinking water;

Acknowledging the fact that water can serve as means of contamination, the quality and quantity of water used in food preparation is advocated to be of utmost quality and sufficient in quantity. Either of these is greatly influenced by the source of the water. In all the food premises visited, only one (12.5%) has irregular water supply but has a borehole dug to satisfy water needs of the food premises. This is a form of guarantee that water-borne diseases are not disseminated from the food premises.

All ice consumed in this hotel are made from drinking water;

Only one of the hotels produces its own ice through an ice making machine and does this using drinking water. The other hotels do not produce their own ice but chill drinks and water in the refrigerator.

All staff handling food wear suitable, clean and appropriate protective clothing.

This being the first component of personal hygiene as it concerns food safety, is meant to ensure that those who come directly or indirectly into contact with food are not likely to contaminate the food with all the dust and other possible impurities they may have come in contact with outside the food preparation area. This stems from the fact that the food area is assumed to be a perpetually ‘sanitized zone’. Failure to maintain appropriate degree of personal cleanliness can contaminate food as presumed by McLauchlin and Little, (2007) which also pointed out strongly that the protective clothing is actually more to protect food from the food handler and not vice versa as widely assumed.

As important as protecting food from the food handler through protective clothing as been shown to be, only two (25%) of the hotels surveyed were found to have made any provision
for staff clothing. As it can be observed on Plates J-002, C-005, C-006, F-013, F-008, B-012 and F-017, both service and production staff worked with their personal clothing which in some cases, did not cover the entire body as is the case on Plate F-008. Any sweats from the body of this food handler stood the chance of falling unto and contaminating the food as it is not absorbed in any way or by any protecting clothing. Plates I-13, A-014 and A-020 shows the only two hotels whose food handlers wear approved protective clothing.

All staff handling food in the food premises are healthy, that is, free from any disease that can be transmitted through food;

The very nature of close human interactions that take place in the food preparation and service areas makes it imperative to ensure that no one permitted to work or be in the food preparation area is suffering from any form of contagious disease. This is to prevent human to human and /or human to food infection. In other to adequately safeguard the health of both staff and customers of a food premises, NEHPR (2007) specifies that each food handler be mandated to have periodic thorough medical examination and be issued with a ‘Certificate of Fitness’, signifying that the food handlers is free from any communicable disease, and is fit to work and interact with other employees. The responsibility for the certification of food handlers falls within the ambits of agency B (Table 4.5).

In all the food premises visited the researcher did not observe any of the food handlers to be suffering from an obvious communicable disease or to have an unprotected infectious or septic wound. However, results presented on Figure 4.11 reveal that only a distressing 11.9% of the food handlers have ever been issued with any Certificate of Fitness. With McLauchlin and Little (2007) assertion that not all diseases or infections will show clinical symptoms and that certain people may be carriers of (especially) gastrointestinal illnesses even after
symptoms have resolved, the researcher’s physical observation of food handlers’ health cannot be considered sufficient for a medical conclusion on the health status of the food handlers hence the need for medical laboratory tests to ascertain the food handlers’ medical fitness for work.

The alarming number (37 out of 42 or 88.1%) of uncertified food handlers processing or handling food could be described as startling going by McLauchlin and Little revelation that food handlers from developing countries are more predisposed to gastrointestinal infections. This means that without proper and thorough medical checkup coupled with the food handlers’ susceptibility to infections and the near non-existent sanitary facilities in the hotels (assay on hotels’ sanitary facilities, page 99), food contamination and spread of infections is inevitable within these food premises.

All food handlers in the food premises are closely supervised and are well trained in food hygiene to an appropriate level;

Just as the medical fitness of food handlers cannot be ascertained by physical examination, so the researcher could not tell by observation, if the food handlers are adequately trained. The results in Figure 4.2 however shows that of the 42 food handlers used for this study, only 14 (33.3%) had the minimum professional qualification of Certificate in Hospitality Management. This shortfall is reflected in the food handlers’ confessed ignorance of food hygiene regulations that exists, connoting that food operations are carried out without adequate understanding of the hygiene principles that should be followed. This is further aggravated by the realization of the fact presented in Figure 4.1 where it was known that the units’ heads’ equally lack academic prerequisites for supervising the food handlers.
A most worrisome situation is noticed however of Hotel J where neither the units’ heads (in this case, the hotel manager and the acclaimed chef) nor the food handler employed have any hospitality professional qualifications (Figures 4.1 and 4.2). This negates Knowles’s (2002) recommendation that unsupervised staff must have adequate training in food hygiene especially, under the situation where the number of staff available are few and does not warrant engaging a supervisor. It should be noted that neither of the two personnel employed in this food premises, one in the capacity of a chef and the other as a cook, has sufficient professional training.

_The hotel never uses raw materials which are contaminated or suspected to be contaminated_; The researcher did not observe any of the hotels using contaminated raw materials as at the time of visit and so assumes that this is a regular practice. This observation could not be deemed conclusive of the fact that only wholesome raw food materials are always used hence its assumption. This would have been ascertained by the agency whose area of jurisdiction covers quality of raw food used during the supposed routine inspections.

_All stages of food preparation are protected from being contaminated_; Contamination of food during one stage of preparation to the other is largely prevented through a well laid out and demarcated workflow which particularly separates preparation sites for raw and cooked foods, and between high risk and other foods (McLauchlin and Little, 2007; Knowles, 2002). As per the researcher’s observation, only one of the food premises has a work flow that can prevent cross contamination at each stage of food production. Plates F-010 and B-015 display multi-tasked tables where both high-risk and other food items are being put together for processing. Contamination of food in these hotels
is more assured than not especially judging the fact that the food handlers in these hotels are neither professionals (Figure 4.2) nor are they trained in-house by their employers (Table 4.3).

*The food premises has facility for holding food at appropriate temperature before service;* Customers to a food premises do not all come at the same time and some degree of cooking is traditionally done and held in anticipation of the guests. Food poisoning bacteria are prone to take advantage of this waiting time to multiply especially if the food is allowed to stay at critical temperatures of between 7° and 63° for a long time (Blanch, (2003); Fosket and Ceserani, (2007))). Only one hotel is noted to have complied with this requirement, having hot cupboards for holding food at appropriate temperature before service as can be seen on Plate A-020.

The operations of the three regulatory agencies as seen from the analysis of data on Figure 4.10 can best be described as haphazard since not all the agencies are committed to inspection visitations and not all hotels are visited for inspection. This inspection slipshod has the propensity to result in an equal slapdash attitude to hygiene standards by hotel operators as confirmed by the evidences gathered through the researcher’s observation checklist assayed above.

4.4.1 Testing Hypothesis 1; This hypothesis was stated thus,

H₁: The level of compliance of hotels in Bauchi metropolis to hygiene and sanitation regulations is above average.

To test this hypothesis, the one way ANOVA was used. The ANOVA is a statistical technique which makes it possible to test for differences among the means of multiple
samples of a population. The ANOVA was used to analyze the total compliance scores of the eight hotels as regards all the 24 conditions of hygiene and sanitation that the regulatory agencies had scored them based on a Likert scale of 1-5. Table 4.9 shows the result of the ANOVA test;

**Table 4.9: ANOVA Test**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N</strong></td>
<td>Valid</td>
</tr>
<tr>
<td><strong>Missing</strong></td>
<td>.000</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>74.250</td>
</tr>
<tr>
<td><strong>Mode</strong></td>
<td>65.000</td>
</tr>
<tr>
<td><strong>Skewness</strong></td>
<td>.568</td>
</tr>
<tr>
<td><strong>Std. Error of Skewness</strong></td>
<td>.472</td>
</tr>
</tbody>
</table>

The total average score was 74.3 and the modal value (most frequent score) was 65 with a skewness of 57. Since the mean is greater than the mode, it means that the compliance is positively skewed. A positively skewed distribution according to Kothari (2004) means that most of the hotels’ compliance is below average. For this reason, the first hypothesis that the level of compliance of hotels in Bauchi metropolis to hygiene and sanitation regulations is above average, is rejected. Likewise it is upheld that the level of compliance of hotels in Bauchi metropolis with hygiene and sanitation is below average agreeing with Knowles (2002) assertion that hotels’ operational good practices do not meet legislative objectives, just as Mohini (2004) regrets that kitchens (referring to developing countries), do not maintain hygiene standards of pride.
Table 4.10: Multiple Comparisons of Hotels’ Compliance Levels

<table>
<thead>
<tr>
<th>(x) Hotel</th>
<th>(y) Hotel</th>
<th>Mean Difference (x-y)</th>
<th>Std. Error</th>
<th>p-value</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>53.66667 *</td>
<td>12.05658</td>
<td>.007</td>
<td>11.9250</td>
</tr>
<tr>
<td>A</td>
<td>C</td>
<td>49.33333 *</td>
<td>12.05658</td>
<td>.015</td>
<td>7.5916</td>
</tr>
<tr>
<td>A</td>
<td>D</td>
<td>45.00000 *</td>
<td>12.05658</td>
<td>.030</td>
<td>3.2583</td>
</tr>
<tr>
<td>A</td>
<td>F</td>
<td>44.00000 *</td>
<td>12.05658</td>
<td>.035</td>
<td>2.2583</td>
</tr>
<tr>
<td>A</td>
<td>G</td>
<td>48.33333 *</td>
<td>12.05658</td>
<td>.018</td>
<td>6.5916</td>
</tr>
<tr>
<td>A</td>
<td>I</td>
<td>32.66667</td>
<td>12.05658</td>
<td>.189</td>
<td>-9.0750</td>
</tr>
<tr>
<td>A</td>
<td>J</td>
<td>69.00000 *</td>
<td>12.05658</td>
<td>.001</td>
<td>27.2583</td>
</tr>
</tbody>
</table>

The above multiple comparisons were to determine the level of compliance or non-compliance of the hotels by comparing the mean differences and the levels of significance as compared with hotel A which is being used as a benchmark (Table 4.10). The result shows that hotel I is the next in compliance compared to hotel A with the least mean difference of 32.67 and level of significance of .189 while hotel J is the least compliant hotel with the highest mean difference of 69 and level of significance of 0.001.

The high level of hygiene infractions exhibited by hotels in Bauchi metropolis as deduced from data presented and analyzed, and the results of the tested hypotheses, can be seen as clear testimony of both the hotels’ operators’ ignorance of the hygiene and sanitation regulations guiding their operations (Figure 4.3) as well as the regulatory agencies’ slackness in enforcing hygiene and sanitation regulations.
4.4.2 Testing hypothesis 2. Hypothesis 2 was stated thus;

\(H_1\): There is a significant relationship between enforcement and the level of compliance to hygiene and sanitation regulations among hotels in Bauchi metropolis.

To test this hypothesis, the compliance scores of the hotels were analyzed against enforcement by the regulatory agencies using the Chi-square analysis. Chi-square (\(\chi^2\)) is a statistical test used to compare whether observed frequencies in certain categories differ significantly from those which would be expected under certain theoretical assumptions. In this study, chi-square test was used to establish if there was a significant relationship between the enforcement of hygiene and sanitation regulations by regulatory agencies and the compliance level of the hotels in Bauchi to the hygiene and sanitation regulations. A p-value (that is the level of significance) of less than 0.05 was considered significant. The chi-square analysis result is stated below;

Table 4.11: Chi-Square Table

<table>
<thead>
<tr>
<th>N</th>
<th>Valid</th>
<th>24.000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Missing</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>74.250</td>
</tr>
<tr>
<td></td>
<td>Mode</td>
<td>65.000a</td>
</tr>
<tr>
<td></td>
<td>Skewness</td>
<td>.568</td>
</tr>
<tr>
<td></td>
<td>Std. Error of Skewness</td>
<td>.472</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chi-Square Tests</th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>4.364a</td>
<td>2</td>
<td>.113</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>4.524</td>
<td>2</td>
<td>.104</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>3.860</td>
<td>1</td>
<td>.049</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>24</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
\( \chi^2 = 4.36, \text{df}^* = 2 \) and \( p = 0.11 \) which is \( > 0.05 \).

*(df = degree of freedom)*

With a significance level \( > 0.05 \) (0.11), this result shows that there is no significant relationship between enforcement and level of hotels’ compliance with hygiene and sanitation regulations in Bauchi and as such the second hypothesis that there is a significant relationship between enforcement and the level of compliance to hygiene and sanitation regulations among hotels in Bauchi metropolis is also rejected. The implication of this \( \chi^2 \) test result is that even though two hotels’ compliance levels are above average, that success cannot be attributed to the efforts of regulatory agencies enforcing compliance. These hotels’ compliance is due to some other factors which have been explored below.

### 4.5 Exploratory Analysis

With the results obtained from the testing of hypothesis 2 above showing that there is no significant relationship between enforcement and compliance, the study did an exploratory comparison between professional qualifications of employees and the hotels’ level of compliance, to discover if there was any relationship between these two variables. The results are as presented in Table 4.12.
A critical examination of the FSA (1990) reveals that the requirements are actually responsibilities for hotels’ management or those in decision making positions to carry out. For example, having all sections of the food premises maintained in good repair, having adequate sanitary, ventilation, drainage, lighting and water supply facilities in appropriate places is more or less a task for managers or units’ heads to ensure and not so much the responsibility of the food handlers. When these basic requirements are in place, the food handlers are also to be supervised to ensure that they put the available facilities to proper use, and that they also carry out their food processing tasks hygienically. For this reason, the total hygiene and sanitation compliance assessment is actually more of assessing the managements’ and unit’ heads’ implementation of the requirements of the FSA.

In Nigeria, Diploma courses in hospitality are meant to prepare students for supervisory roles while the HNDs are meant to prepare students for managerial roles in the industry as
contained in the NBTE syllabus (NBTE, 2007). For this reason, it is expected that it is those with a minimum qualification of Diploma in Hospitality Management that should hold managerial or supervisory status to be able to effectively supervise food handlers under them in the maintenance of hygiene and sanitation standards.

Table 4.12 shows that there is a complementary relationship between academic qualification of supervisors/managers and their ability to comply with the hygiene and sanitation regulations even without it being enforced on them. This was subjected to a chi-square ($\chi^2$) test at a level of significance (P) of < 0.05 and the results are shown on Tables 4.13 and 4.14.

### Table 4.13: Professional Qualifications vs Compliance Level Cross Tabulation

<table>
<thead>
<tr>
<th>Professional Qualifications</th>
<th>Compliance Level</th>
<th>Low</th>
<th>High</th>
<th>Very High</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diploma</td>
<td></td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>HND</td>
<td></td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>PGD</td>
<td></td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Unqualified</td>
<td></td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>6</td>
<td>1</td>
<td>3</td>
<td>10</td>
</tr>
</tbody>
</table>

### Table 4.14: Chi-Square Tests

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>16.250</td>
<td>6</td>
<td>.012</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>13.460</td>
<td>6</td>
<td>.036</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>.043</td>
<td>1</td>
<td>.835</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 12 cells (100.0%) have expected count less than 5. The minimum expected count is .10.
The $\chi^2$ test result of 16.25 value, and a P value of .012 which is < 0.05, confirms that there is a significant relationship between the professional qualification of the hotels’ units’ heads and level of compliance. This corroborates Blanch’s (2003) assertion on the importance of education and training to the food staff that these are more likely to follow procedures if they have an understanding of the reasons behind them. The finding also supports Knowles’s (2002) opinion that training, formally or informally, endows the trained adequately with greater level of understanding acquired at the end of the training process.
CHAPTER FIVE
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction
This chapter presents a summary of the study findings as demonstrated in the preceding chapter. Major conclusions are highlighted thematically based on the study objectives and recommendations made for further research and for policy making.

5.2 Summary of findings
The aim of the study was to establish regulatory agencies’ effectiveness in enforcing compliance with hygiene and sanitation regulations among urban and sub-urban classified hotels in Bauchi state, Nigeria. More precisely, the study looked at issues of the level of hotel operators and their food handler employees’ awareness of the hygiene and sanitation regulations which guide their operations in Bauchi State, the level of compliance of hotels in Bauchi State to the hygiene and sanitation regulations as regards premises, equipment and personnel hygiene as well as regulatory and enforcement agencies’ effectiveness in enforcing compliance to hygiene and sanitation standards. The study also did an exploratory analysis of other factors which influences hotels’ compliance with hygiene and sanitary regulations.

The summary of the findings, conclusions and recommendations for policy and further research are presented according to the objectives of the study in proceeding sections.

5.2.1 Hotel operators and their food handler employee’s awareness of the hygiene and sanitation regulations which guide their operations in Bauchi state
This study sought to determine if hotel operators and their food handler employees are aware of the hygiene and sanitation regulations that guide their operations in Bauchi. To achieve
this objective, both the hotels’ units’ heads and the production/service staff were asked to indicate if they are aware of either the Food Safety Act (1990) which is an international food safety guide or the NEHPR (2007) of Nigeria. A proportion of 66.7% of units’ heads and only 69% of the production/service staff are aware of the FSA (1990) while none of either the units’ heads or the production/service staff is aware of the NEHPR (2007) (Figure 4.3). This is not unassociated with the fact that only 38.1% and 31% of units’ heads and food handlers, respectively are hospitality professionals (Table 4.1), which is a means of being knowledgeable about hygiene and sanitation operational guides.

Hotels’ units’ heads were requested to indicate if they ever received any written health and sanitation guidelines from any of the three relevant regulatory agencies which is an alternative medium of getting informed about the food hygiene and sanitation regulations guiding hotel operations in Bauchi state. All of the units’ heads indicated they have never received any written health and sanitation guidelines from any of the three relevant regulatory agencies. This result is presented on Table 4.5.

Likewise, the three regulatory agencies used for this study were asked if they make written health and sanitation guidelines available to hotel operators in Bauchi and also to indicate by what means the health and sanitation guidelines are being communicated to the hotel operators. All of the regulatory agencies revealed that they do not make written health and sanitation guidelines available to the hotel operators but rather communicate these to them verbally and through organizing awareness campaigns and seminars. This result is as presented on Figure4.4.
Since employers are under an obligation to conduct hygiene training for their food handler employees and to also make health and safety requirements available to them, the food handlers were requested to indicate if their employers conduct hygiene trainings for them as well as if they make health and safety requirements available to them and the regularity of such. As presented on Tables 4.3 and 4.4 respectively, only 38.1% of the food handlers have been receiving hygiene training from their employers with the highest frequency interval of three month. Similarly, only 17% of the 42 food handlers claim their employers make health and safety requirements available to them at the highest regular interval of three months.

From the findings above, majority of the hotel operators in Bauchi are aware of only the international food hygiene and sanitation law of the FSA (1990) and none is aware of the NEHPR (2007). Less than half (50 %) of food handlers are aware of the food safety laws and are not being trained by their employers.

5.2.2 The level of Compliance of Hotels in Bauchi State to Hygiene and Sanitation Regulations as Regards Premises, Equipment and Personnel Hygiene

This study sought to establish the level of hotels’ compliance with at least the food hygiene and sanitation regulations which they are aware of. This objective was achieved by listing 24 conditions of hygiene and sanitation which hotel operators are expected to comply with as per the FSA (1990) requirements. A Likert scale of 5 (‘very good’) and 1 (‘very poor’) was used to assist the regulatory agencies rate the hotels’ hygiene and sanitation performance. The hotels’ individual compliance score was computed and cross-tabulated against the regulatory agencies’ ratings using descriptive statistics. From the study, out of the eight hotels investigated, only one has a high compliance level, one has an average compliance level and
all other six hotels which represent 67.5% of the hotel population have a low compliance level. (Figures 4.5 and 4.6)

5.2.3 Regulatory and Enforcement Agencies’ Effectiveness in Enforcing Compliance to
Hygiene and Sanitation Standards

Since the process of enforcement entails that the regulatory agencies pay inspection visits to
the food premises, these were asked to indicate whether or not they are able to do this as
scheduled as well as list if any, possible impediments. Of the three regulatory and
enforcement agencies, only one of them claimed to be able to carry out inspection visits to
the hotels as scheduled. The other two blamed their negligence to carry out scheduled
inspection visits on insufficient funds, lack of manpower and other logistics.

In the same vein, the hotels’ units’ heads and production/service staff were asked to indicate
if and which of the regulatory and enforcement agencies pay them inspection visits. The
result from the study reveals that a combination of two agencies at most, pay inspection visits
to the hotels. Data presented on Figure 4.10 shows that no one hotel is inspected by all the
three agencies at any one time. It was also indicated that agency A is most faithful in carrying
out inspection visits.

In order to establish the regulatory and enforcement agencies effectiveness in enforcing
compliance to hygiene and sanitation regulations, the study sought from the hotels’ units’
heads and the production/service staff those areas of hygiene and sanitation that are most
emphasized during the agencies’ inspection visits. Study results show that of the twenty-four
conditions of hygiene and sanitation, only five conditions which coincidentally tally with
agency A’s area of jurisdiction, are the most emphasized (Table 4.8). Furthermore, an important indices of agency B’s effectiveness which is the certification of food handlers is discovered to be scarcely implemented. This is confirmed by the fact that only 11.9% of the 42 food handlers used for this study have Certificates of Fitness (Figure 4.11) which is a crucial requirement for all food handlers.

The ANOVA and chi-square test results of the study hypotheses confirm that the level of compliance of urban and sub-urban hotels in Bauchi to hygiene and sanitation regulations is below average. Also, there is no significant relationship between hotels’ compliance with hygiene and sanitation regulation and regulatory agencies’ enforcement efforts. Thus both hypotheses one and two were rejected

Having established that the regulatory and enforcement agencies have not positively influenced hotels’ compliance with hygiene and sanitation regulations, and discovering that despite this, hotels A and I compliance levels have rated average and high respectively, the study cross tabulated hotels’ level of compliance with other variables using the chi-square test and discovered that relevant professional qualifications in hospitality is a strong factor which influences compliance with regulations.

5.2.4 Synopsis of findings

In a nutshell, findings of the study includes that hotel operators and food handlers are scarcely aware of the hygiene and sanitation regulations guiding their operations, the general compliance level of hotels to hygiene and sanitation regulations is below average, regulatory
and enforcement agencies collectively do not perform their functions effectively. Based on these, hypothesis 1 and hypothesis 2 were rejected.

5.3 Conclusions

From the findings of this study, it can be concluded that a significant number of hotel operators and food handlers are aware of the FSA (1990) but not of the existence of the NEHPR (2007) of Nigeria. This agrees with Aibor and Olorunda, (2006)’s assertion that in Nigeria most food handlers are not aware of common hygiene rules. A higher percentage of units’ heads including hotel managers and food handlers lack appropriate supervisory/managerial or operational professional qualifications as demanded in the FSA (1990).

It is concluded that the level of hotels’ compliance to these regulations is below average. This is in agreement with Knowles (2002), who observes that there exists a gap between legislative intentions and hotels’ operational good practices especially in the area of compliance with hygiene and sanitation regulations and which is not without its attendant negative implications for the provision of safe food to the customer.

The study concluded that there is a perceived flaw in the hospitality education and training course content of the NBTE syllabus especially with regards to food safety as no mention is made of, and no emphasis is placed on the NEHPR (2007) in the syllabus. The NEHPR (2007) expectedly will be more relevant to meet the hygiene and sanitation expectations of the Nigerian situation.
Another conclusion of note is that regulatory and enforcement agencies are collectively constrained in carrying out their duties of enforcement effectively as specified in the Public Health Laws (1998) of Nigeria. A contributory factor to this is that there is no perceived collaboration between the three agencies each of which has different areas of inspection jurisdictions. Inability of one agency to carry out its duty leaves its area of jurisdiction in jeopardy. Finally, it is concluded that agency A, though needing to improve, is able to make remarkable effort in carrying out its functions as compared with the other two agencies.

5.4. Research Academic Contribution and Gap filled

The academic gap which this study set out to fill was to ascertain the hygiene status of hotels in Bauchi and the certainty of regulatory agencies’ execution of statutory role in the enforcement and maintenance of hygiene and sanitation standards. From preceding data presentations and analyses, this study concludes empirically that regulatory agencies in Bauchi do not effectively enforce hygiene and sanitation regulations which have resulted in hotels’ non compliance with hygiene and sanitation standards with all its attendant implications.

5.5 Recommendations

As emphasized by Bowman and Russell (2001) that assured and sustained food safety lies in the collective efforts of consumers, food producers, public health authorities and the government, and based on the findings of this research, hygiene and sanitation standards in urban and sub-urban hotels in Bauchi can be improved by adopting some of the following suggestions:-
5.5.1 Policy Recommendations

Seven areas of policy have been suggested from the study findings as follows;

- A critical review of the professional qualification and legal requirements for granting approval for the establishment and running of a food business in Nigeria is hereby recommended. A prospective hotel entrepreneur should be required to have acquired a basic training and qualification in food hygiene and safety before being granted the license to operate a food business. This, which should be strictly adhered to should also form a criterion for the grading and classification of hotels and restaurants.

- Furthermore, introduction of degree courses such as Bachelors of Science (BSc) in hospitality, is recommended to complement the present professional qualifications obtainable in hospitality management in Nigeria. It is believed that this will breed intellectuals in the hospitality industry who will be instrumental in formulating ideal food safety policies. It is also believed that such higher academic ventures will heighten researches especially in the areas of food safety which will in turn enhance the formulation of the food safety policy suggested above.

- It is recommended that the three regulatory agencies’ functions be synergized under only one agency so that there can be a concentration of especially financial resources for the implementation of effective enforcement.

- In addition, it is strongly recommended that food hygiene and sanitation issues be given better attention by food hygiene and sanitation policy makers, by separating these from environmental issues as is the case with the present NEHPR (2007) document. A new and comprehensive food safety guide is recommended to be legislated which will emphatically include a checklist for the inspection officers which will serve same purpose as the Code of Practice of the FSA (1990) and the
frequency of inspections (which is recommended not be more than three months interval).

Since by the time of the study there were hotel operators who were ignorant of the hygiene and sanitation regulations that guide their food operations,

- It is recommended that regular symposia on the existence, requirements and implications of the food hygiene and sanitation regulations that guide hotel operations in Bauchi be organized for the benefit of the hotel operators. In the same vein, it is recommended that copies of the food hygiene and sanitation requirements that guide hotel operations in Bauchi be printed and made abundantly available to all hotel operators and the content adequately interpreted if possible in Hausa language which is the predominant language spoken in Bauchi state

- Incentives in the form of recognition and reward for high compliance with hygiene and sanitation regulation by regulatory and enforcement agencies may go a long way in motivating hotel operators to comply with the Regulations.

- As has been gathered form literature that there is under or non reporting of food poisoning cases, this study recommends the need for aggressive public consumer enlightenment concerning the need for prompt reporting cases of food poisoning no matter how mild so that tracts can be made of the prevalence or otherwise of food poisonings for proper documentation and for future use.

5.5.2 Recommendation for Further Research

- An observation of the current hospitality course syllabi in Nigeria does not contain any mention of the National Environmental Health Practices Regulations which supposedly should guide hotel operations in Nigeria, it is hereby recommended that
the current hospitality syllabi be reviewed and this Regulation be given prominence. This will ensure that as many as have acquired professional qualifications in hospitality are able to receive relevant and adequate training in food hygiene and safety.

- It is observed that a good percentage of the hotels’ units’ heads (which included the hotel managers) and food handlers did not possess any professional qualifications in hospitality or related courses. It is also deduced from the findings of the study that there is a significant relationship between professional qualifications of hotels’ supervisors/managers and the hygiene standards of the hotels. Based on this, it is recommended that further studies be made to consider those factors which affect entrepreneurship and employment patterns (as regards the hiring of professionals or non-professionals) in the hospitality industry and how professional qualifications affect service quality in the hospitality industry.
REFERENCES


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APPENDICES

Appendix 1: QUESTIONNAIRE FOR HOTELS UNITS’ HEADS

ASSESSING COMPLIANCE WITH FOOD HYGIENE REQUIREMENTS AMONG URBAN AND SUB-URBAN CLASSIFIED HOTELS IN BAUCHI STATE, NIGERIA

Please complete the questionnaire by marking an ‘x’ in the boxes beside the answers you wish to choose, and write out your responses on the lines provided where applicable.

1. Gender  
   Male  □  Female  □

2. Age  
   16 – 25  □  25 – 45  □  45 – above  □

3. Highest Qualification ________________________________

4. Department ________________________________

5. Is your premises licensed?
   Yes  □  No  □

6. Are you aware of any Food Safety Act (for example, FSA, 1990)?
   Yes  □  No  □

7. Are you aware of the National Environmental Health Practices Regulations (2007)?
   Yes  □  No  □

8. What is your source of regular water supply?
   Tap □  Borehole □  Well □

9. Do you occasionally experience water shortage?
   Yes  □  No  □

10. If answer to question 7 above is ‘yes’ what alternative source do you resolve to:

11. How is your garbage disposed off?
   a – Poured into incinerator □
   b - Burnt □
   c –The Environmental Protection Agency collects them □
12. Does any government agency come to inspect your hotel premises?
   Yes □  No □

13. If answer to question 7 above is ‘yes’; which of the agency or agencies come?

   ________________________________________________________________

14. How often does/do the agency/agencies come to inspect the premises?
   Every month □
   Every three months □
   Every six months □
   Every twelve months □
   Others (please specify)________________________________________

15. When they come which areas are they particular about? (Please mark ‘x’ in all applicable boxes)
   - Cleanliness of premises □
   - Maintenance of premises □
   - Availability of hand washing facilities □
   - Availability and location of toilets □
   - Availability of wash basins with hot and cold running water separate from facilities for washing food □
   - Adequate ventilation □
   - Adequate drainage □
   - Availability of changing facility □
   - Cleanliness of floors, walls, ceilings and other surfaces □
   - Types of materials cooking and service equipment are made from □
   - Mode of waste disposal □
   - Containers for food and other wastes □
   - Arrangement for storage and removal of refuse □
- Water supply
- Staff uniforms
- Staff general health
- Types of food raw materials used
- Food storage
- Staff training on hygiene
- Methods and means of food temperature control

16. Does any regulatory body make available to you any written health and sanitation requirements and regulations that you must observe at your premises?  
    Yes ☐ No ☐

17. If your answer to question 14 above is ‘No’, are you aware of the health and sanitation requirements and regulations governing the activities of hotels in Bauchi?  
    Yes ☐ No ☐

18. If your answer to question 15 above is ‘Yes’, mark ‘Y’ in the boxes besides the regulations you are aware of and ‘N’ in the boxes beside the regulation you are not aware of in the following list of regulations;

- Cleanliness of premises ☐
- Maintenance of premises ☐
- Availability of hand washing facilities ☐
- Availability and location of toilets ☐
- Availability of wash basins with hot and cold running water separate from facilities for washing food ☐
- Adequate ventilation ☐
- Adequate drainage ☐
- Availability of changing facility ☐
- Cleanliness of floors, walls, ceilings and other surfaces ☐
- Types of materials cooking and service equipment are made from ☐
- Mode of waste disposal ☐
- Containers for food and other wastes ☐
- Arrangement for storage and removal of refuse ☐
- Water supply
- Staff uniforms
- Staff general health
- Types of food raw materials used
- Food storage
- Staff training on hygiene
- Methods and means of food temperature control

Thank You
### Appendix 2: QUESTIONNAIRE FOR HOTELS FOOD AND BEVERAGE STAFF

**ASSESSING COMPLIANCE WITH FOOD HYGIENE REQUIREMENTS AMONG URBAN AND SUB-URBAN CLASSIFIED HOTELS IN BAUCHI STATE, NIGERIA**

Please complete the questionnaire by marking an ‘x’ in the boxes beside the answers you wish to choose, and write out your responses on the lines provided where applicable.

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Gender</td>
<td>Male</td>
<td></td>
<td>Female</td>
</tr>
<tr>
<td>3.</td>
<td>Department</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Designation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Highest qualification</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>For how long have you been working for this establishment?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Are you aware of any Food Safety Act (for example, FSA, 1990)?</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Are you aware of the National Environmental Health Practices Regulations (2007)?</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Does your establishment conduct any hygiene training for you?</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Does your establishment makes available to you any health and safety requirements?</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>If your answer to question ‘11’ above is ‘yes’, how often?</td>
<td>Every 3 months</td>
<td></td>
<td>Every 6 months</td>
</tr>
</tbody>
</table>
12. Have you been issued with a Certificate of Fitness?
   Yes ☐ No ☐

13. Does any government agency come to inspect your hotel premises?
   Yes ☐ No ☐

14. If answer to question 17 above is ‘yes’, which of the agency or agencies come?

15. How often does/do the agency/agencies come to inspect the premises?
   Every month ☐
   Every three months ☐
   Every Six months ☐
   Every twelve months ☐
   Others (please specify) ________________________________

16. When they come which areas are they particular about? (Please mark ‘x’ in all applicable boxes)
   - Cleanliness of premises ☐
   - Maintenance of premises ☐
   - Availability of hand washing facilities ☐
   - Availability and location of toilets ☐
   - Availability of wash basins with hot and cold running water separate from facilities for washing food ☐
   - Adequate ventilation ☐
   - Adequate drainage ☐
   - Availability of changing facility ☐
   - Cleanliness of floors, walls, ceilings and other surfaces ☐
   - Types of materials cooking and service equipment are made from ☐
   - Mode of waste disposal ☐
   - Containers for food and other wastes ☐
- Arrangement for storage and removal of refuse
- Water supply
- Staff uniforms
- Staff general health
- Types of food raw materials used
- Food storage
- Staff training on hygiene
- Methods and means of food temperature control

Thank You
Appendix 3: QUESTIONNAIRE FOR REGULATORY AGENCIES

ASSESSING COMPLIANCE WITH FOOD HYGIENE REQUIREMENTS AMONG URBAN AND SUB-URBAN CLASSIFIED HOTELS IN BAUCHI STATE, NIGERIA

Please complete the questionnaire by marking an ‘x’ in the boxes beside the answers you wish to choose, and write out your responses on the lines provided where applicable.

1. Gender  
   Male     ☐  Female       ☐

2. Age  
   16 – 25 ☐  25 – 45 ☐  45 – above ☐

3. Highest Qualification ____________________________

4. Name of agency ________________________________

5. Primary function _______________________________

6. Does your organization make available written health and sanitation requirements and regulations that hotel operators must observe at their premises to them?  
   Yes ☐  No ☐

7. If your answer to question 6 above is ‘No’, how do you communicate the health and sanitation regulations to the hotel operators?  

8. Are you able to carry out inspections as scheduled?  
   Yes ☐  No ☐

9. If your answer to question 8 above is ‘No’ what is/are the reason(s)?  
   ________________________________

10. How would you describe the level of compliance with sanitation standard of hotels in Bauchi?  
    Satisfactory ☐  Not satisfactory ☐

16. Please indicate your level of agreement or disagreement with the following statements about each of the listed hotels pertaining their levels of sanitation conditions using the following scale; 1 – Very Poor  2 – Poor  3 – Average  4 – Good  5 – Very Good
<table>
<thead>
<tr>
<th>S/N</th>
<th>Sanitation Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Food Premises</strong></td>
</tr>
<tr>
<td></td>
<td>All sections of this food premises are clean and maintained in good repair</td>
</tr>
<tr>
<td>2</td>
<td>Layout, design, construction and size of this food premises is designed and built to ensure good hygiene.</td>
</tr>
<tr>
<td>3</td>
<td>All sanitary and hand washing facilities in this food premises are adequate and in good condition.</td>
</tr>
<tr>
<td>4</td>
<td>This food premises has wash basins with hot/cold running water and materials for drying hands.</td>
</tr>
<tr>
<td>5</td>
<td>There are separate facilities for washing food and for washing hands.</td>
</tr>
<tr>
<td>6</td>
<td>There are adequate ventilation facilities which are also accessible and suitable for cleaning.</td>
</tr>
<tr>
<td>7</td>
<td>All areas in this food premises has adequate lighting.</td>
</tr>
<tr>
<td>8</td>
<td>The food premises has adequate drainage in all the appropriate places.</td>
</tr>
<tr>
<td>9</td>
<td>There are enough changing facilities in the food premises.</td>
</tr>
<tr>
<td>10</td>
<td><strong>Food rooms</strong></td>
</tr>
<tr>
<td></td>
<td>All rooms’ floors, walls, ceiling and other surfaces maintained clean and disinfected.</td>
</tr>
<tr>
<td>11</td>
<td>There are enough facilities, tools, and equipment for cleaning purposes.</td>
</tr>
<tr>
<td>12</td>
<td><strong>Equipment</strong></td>
</tr>
<tr>
<td></td>
<td>All utensils, fittings and equipment that can come into contact with food are made of materials that can be kept clean.</td>
</tr>
<tr>
<td>13</td>
<td>All equipment are moveable to ensure cleaning of surrounding areas.</td>
</tr>
<tr>
<td>14</td>
<td><strong>Food Waste</strong></td>
</tr>
<tr>
<td></td>
<td>All food and other wastes from the food premises are disposed of quickly to avoid accumulation.</td>
</tr>
<tr>
<td>15</td>
<td>All containers for food and other wastes can be closed, cleaned and disinfected.</td>
</tr>
<tr>
<td></td>
<td>Description</td>
</tr>
<tr>
<td>---</td>
<td>-------------</td>
</tr>
<tr>
<td>16</td>
<td>All storage and waste disposal facilities are designed and built so that they are easily cleaned and are pets proof.</td>
</tr>
</tbody>
</table>
| 17 | **Water Supply**  
There is adequate supply of portable drinking water. |
| 18 | All ice consumed in this food premises are made from drinking water. |
| 19 | **Personal Hygiene**  
All staff handling food wear suitable, clean and appropriate protective clothing. |
| 20 | All staff handling food in this food premises are healthy, that is, free from any disease that can be transmitted through food. |
| 21 | **Food Stuff**  
The food premises never uses raw materials which are contaminated or are suspected of being contaminated. |
| 22 | All stages of food preparation are protected from being contaminated. |
| 23 | **Training**  
All food handlers in this food premises are closely supervised and are well trained in food hygiene to an appropriate level |
| 24 | **Temperature Control**  
This food premises has facility for holding food at appropriate temperature before service. |

Thank You
# Appendix 4: RESEARCHER’S OBSERVATION CHECK-LIST

ASSESSING COMPLIANCE WITH FOOD HYGIENE REQUIREMENTS AMONG URBAN AND SUB-URBAN CLASSIFIED HOTELS IN BAUCHI STATE, NIGERIA

<table>
<thead>
<tr>
<th>Name of Hotel</th>
<th>Hotel Code</th>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
</table>

## Food Premises

I. All sections of food premises are clean and maintained in good repair.
   - Yes [ ]  No [ ]

II. Layout, design, construction and size of this food premises is designed and built to ensure good hygiene.
   - Yes [ ]  No [ ]

III. All sanitary and hand washing facilities in this food premises are adequate and in good condition.
   - Yes [ ]  No [ ]

IV. This food premises has wash basins with hot/cold running water and materials for drying hands.
   - Yes [ ]  No [ ]

V. There are separate facilities for washing food and for washing hands.
   - Yes [ ]  No [ ]

VI. There are adequate ventilation facilities which are also accessible and suitable for cleaning.
   - Yes [ ]  No [ ]

VII. All areas in this food premises has adequate lighting.
    - Yes [ ]  No [ ]

VIII. The hotel has adequate drainage in all the appropriate places.
     - Yes [ ]  No [ ]

IX. There are enough changing facilities in the hotel.
    - Yes [ ]  No [ ]
**Food rooms**

X. All rooms’ floors, walls, ceiling and other surfaces maintained clean and disinfected.
   Yes ☐ No ☐

XI. There are enough facilities, tools, and equipment for cleaning purposes.
   Yes ☐ No ☐

**Equipment**

XII. All utensils, fittings and equipment that can come into contact with food are made of materials that can be kept clean.
   Yes ☐ No ☐

XIII. All equipment are moveable to ensure cleaning of surrounding areas.
   Yes ☐ No ☐

**Food Waste**

XIV. All food and other wastes from the food premises are disposed of quickly to avoid accumulation.
   Yes ☐ No ☐

XV. All containers for food and other wastes can be closed, cleaned and disinfected.
   Yes ☐ No ☐

XVI. All storage and waste disposal facilities are designed and built so that they are easily cleaned and are pets proof.
   Yes ☐ No ☐

**Water Supply**

XVII. There is adequate supply of portable drinking water
   Yes ☐ No ☐

XVIII. All ice consumed in this food premises are made from drinking water.
   Yes ☐ No ☐
**Personal Hygiene**

XIX. All staff handling food wear suitable, clean and appropriate protective clothing.

Yes ☐ No ☐

XX. All staff handling food in this food premises are healthy, i.e. free from any disease that can be transmitted through food.

Yes ☐ No ☐

**Food Stuff**

XXI. The food premises never uses raw materials which are contaminated or are suspected of being contaminated.

Yes ☐ No ☐

XXII. All stages of food preparation are protected from being contaminated.

Yes ☐ No ☐

**Training**

XXIII. All food handlers in this food premises are closely supervised and are well trained in food hygiene to an appropriate level.

Yes ☐ No ☐

**Temperature Control**

XXIV. This food premises has facility for holding food at appropriate temperature before service.

Yes ☐ No ☐

**Other Comments**

_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
Outside hotel J

- Garbage is collected and burnt right in front of the hotel kitchen. The ‘chef’ is standing next to the door while the picture was being taken
Inside Hotel J:

- Inadequate ventilation,
- Inadequate lighting,
- The ‘Chef’ not in protective clothing.
- Washing soap arranged on the same table as plates, risking chemical contamination of plates to be used for service
Plate J-003

- Kitchen wall derelict and not maintained clean
Hotel C pantry;
  - Derelict wall,
  - Sinks need plumbing work-repair as water dripping from the sinks is being collected with buckets
Inside Hotel C restaurant:
- Service staff not wearing protective clothing
- Staff wears imposing jewelry.
Plate C-006

Inside Hotel C kitchen;
- Kitchen staff not wearing protective clothing,
- Kitchen layout is cramped and without a defined work-flow,
Inside Hotel C kitchen;
  - The paint on the ceiling is peeling off
Inside Hotel F:

- Kitchen not well lit,
- Kitchen staff not wearing protective clothing,
Inside Hotel F;
- Equipment fitted to the wall not allowing for cleaning around them,
- Layout though spacious, but it is without a defined work-flow
- Inadequate natural and non-existent artificial ventilation
Inside Hotel F kitchen;
  - Stages of food preparation not protected from cross-contamination as only one table is used for all food preparation activities
  - Staff do not wear protective clothing
Plate B-011

Inside Hotel B kitchen;
- Multi-tasked table - raw food items left on the same table that is used for storage of other things such as plates, risking cross-contamination
Inside Hotel B kitchen;

- Staff-workers do not wear protective clothing,
- Kitchen layout does not have a defined work-flow,
- Kitchen not spacious enough,
- Wall finishing not of hygienic material (wall plaster/cover chipping off)
- Wash-up liquid, which can easily fall and pour unto the food being processed in the sink, is kept on the window, risking chemical food contamination
Plate I-013

Inside Hotel I kitchen;
✓ Staff wearing protective clothing
✓ Kitchen appears clean and orderly,
✓ Kitchen wall appears pristine

- Equipment fitted to the wall, not allowing for cleaning around them
Plate A-014

Inside Hotel A restaurant;
 ✓ Personnel in staff uniforms
 ✓ Restaurant appears pristine
Inside Hotel A kitchen;
✓ Adequate lighting,
✓ Well defined work-flow
✓ Adequate ventilation
✓ Equipment not fitted to the wall
Restaurant J kept clean and with
Adequate lighting and ventilation

Plate J-016
Restaurant F kept clean
Plate A-018

Well arranged Hotel A kitchen
Plate A-019

✓ Drainages constructed in appropriate places in Hotel A
Plate A-020

✓ Hotel A kitchen having facility for holding food at appropriate temperatures
✓ Staff wearing protective clothing
Plate A-021

✓ Proper arrangement of facilities inside Hotel A kitchen
Plate A-022

✔ Hotel A having facilities for hot and cold water dispensing
Plate G-023

- Rubbish left exposed in Hotel G kitchen
Plate F-024

- Garbage left to accumulate in Hotel F