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Assessment of Sanitary Condition of Food Catering Establishments in Addis Ketema sub-City, Addis Ababa City Administration

By

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(BSc.Environmental Health Science)

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Acronyms

AAAHB	Addis Ababa city Administration Health Bureau
AIDS	Acquired Immunodeficiency Syndrome (AIDS)
CDC	Centers for Disease Control and Prevention
DCA	Deoxycholate Citrate Agar
EFMHACA	Ethiopian Food, Medicine, Health care Administration and Control Authority
FMOH	Federal Ministry of Health
IRB	Institutional Review Board
WHO	World Health Organization

Abstract

Background: Food borne illnesses are prevalent in all parts of the world. However, number of related problems keep food borne diseases at high levels within the African Region, the root cause is poverty, which exacerbates food safety problems in many ways and contributes to unsanitary conditions in rapidly growing urban centers, lack of access to clean water, unhygienic transportation and storage of foods. Just like many other African countries, food borne illnesses are prevalent in Ethiopia and the loss of human life and suffering is enormous.

Objective: The purpose of this study was to assess the sanitary condition of food catering establishment in Addis Ketema Sub-City, Addis Ababa City Administration.

Methods: A cross sectional study was conducted from March to April 2014 at different Food catering establishments in Addis Ababa city Administration Addis Ketema Sub-City selected by using Stratified random sampling method followed by population proportion to size allocation. Three hundred fifty two establishments were enrolled in this study. Microbiological tests of food utensils were conducted using standard laboratory procedures. The collected data was cleaned and entered by developing a template using Epi info 3.5.3 and the sanitary condition of food catering establishments were analyzed by using SPSS version 16 Software.

Results: Latrine facilities were available in 297 (84.6%) catering food establishments. However, the toilets were not separately constructed from kitchen room. 234 (66.7%) of the kitchens had access to running tap water inside the facility. Conventional types of sinks fixed with running tap water were available in 245(69.8%) of the catering food establishments. Of the examined food utensils for bacteriologic content. Staphylococcus aureus were found in 14(36.8%), Escherichia Coli in 6 (15.8%) and 4(10.5%) Shigella species were found from the swabbed utensils

Conclusion and recommendation: The sanitary condition of catering food establishments in the study area were found to have poor sanitation and were not fulfil the requirements of catering food establishments. Appropriate regular inspection of food catering establishment should be strengthening by regulatory body Sub-City and Woreda health to the fulfilment of catering food establishments to acceptable sanitary conditions.

Keywords: Catering, Sanitary condition, Hygienic requirements, Swab test

1 Introduction

1.1 Background

Food borne illnesses are prevalent in all parts of the world, and the toll in terms of human life and suffering is enormous. Growing urbanization and lifestyle changes lead people to dine away from home more often, contributing to the unregulated opening of eating establishments that often have inadequate hygiene conditions (1).

Contaminated food and water have been known to be sources of illness in human societies since antiquity. Food borne diseases are still among the most widespread health problems in the contemporary world. The globalization of the food supply system has presented new challenges for food safety and has contributed to the international public health problem of food borne disease. This is attributed to the growing industrialization and trade of food produce, rapid urbanization associated with increased food preparation/consumption outside the home and the emergence of new or antibiotic-resistant pathogens and food vehicles (2,3).

The Western Pacific Region has experienced a number of serious outbreaks, including at least one recent instance of intentional contamination of the food supply:· In 2002, in China, more than 200 schoolchildren were sicken and 38 died from the intentional contamination of bakery products after a competitor put rat poison into the breakfast snacks of a restaurant in Tangshan, a suburb of Nanjing· In 2000, food poisoning linked to milk products produced in the Osaka factory of the Snow Brand Company sickened 14,780 persons, making this one of Japan‟s largest food poisoning outbreaks ever (3).

Food safety issues in Africa are mostly centered on illnesses that are linked to poor hygiene but food hygiene in homes, schools and markets remains an area of concern. Although outbreaks are frequent in the African region, individual countries have done little to implement surveillance systems for food-borne diseases (4).

Several devastating outbreaks of food borne diseases have been reported in the African Region. For instance, acute aflatoxicosis in Kenya, in 2004, associated with maize and bromide poisoning in Angola, in 2007, associated with use of sodium bromide as salt. The Regional Office also

recorded several outbreaks associated with contaminated food including: anthrax in Zimbabwe, typhoid fever and botulism in Uganda, chemical intoxication due to consumption of seed beans and maize in Nigeria, pesticide residues from cabbage and other vegetables in Senegal, konzo from bitter cassava in the Democratic Republic of Congo and food poisoning in many other countries. The increased number of food-related emergencies in the African Region and food trade globalization which has increased the likelihood of international incidents involving contaminated food, it is necessary to strengthen systems to allow the early detection, management and prevention of spread of food borne diseases. It requires Member States to notify WHO of disease outbreaks of international concern, including food borne diseases (5).

The number of inhabitants in Addis Ababa City is increasing rapidly as a result the number of food catering establishments is also increasing in the city to meet the growing demand for eating place. Food borne disease is one of common health problem seen in the city. Poor sanitation of food catering establishments is one of the many reasons why food borne disease is common health problem in the city. For instance, an outbreak of Acquit watery diarrhea diseases that occurred in 2010 in the city was believed due to poor standard of food catering establishments. Addis Ababa regional health bureau tried to decrease the threat of Acquit watery diarrhea diseases outbreaks by performing strict sanitation campaign in food catering establishments (6).

1.2 Statement of the problem

Food elaborated with satisfactory hygienic standards is one of the essential conditions for promoting and preventing health. On the other hand food can also be a source of infection if the sanitary and hygienic rules are not implemented properly. For example poor personal hygiene of food handlers frequently contributes to outbreaks of food borne illness such as Staphylococcus aureus (S.aureus), Salmoonella species, Shigella species, Campylobacter jejuni, Enterotoxigenic E.coli as well as viral agents, such as hepatitis A, and Norovirus (1,2).

The number of consumers who are highly vulnerable to food borne illness is growing in African region. While poverty is the underlying cause of consumption of unsafe food in the African region, other factors, such as lack of access to clean water, population growth, and other communicable diseases and poor environmental conditions exacerbate the situation (2).

Just like many other African countries, food borne illnesses are prevalent in Ethiopia and the loss of human life and suffering is enormous. Epidemiologic data related to food-borne diseases are inadequate in Ethiopia. But it can be evidenced that these are very common in the country because of many reasons including poverty, lack of awareness, poor water supply, poor personal hygiene and environmental sanitation, etc. According to the 2002-2003 "Health and Health-related Indicators" published by the Planning and Programming Department of the Federal Ministry of Health of Ethiopia, Helminthic infections were the second leading cause of outpatient visits, Dysentery and different parasitic infections were also among the ten top causes of outpatient visits, Dysentery was among the leading causes of hospital admissions and deaths, Typhoid fever, acute diarrheal diseases, bloody diarrhea and anthrax were reported as some of the major causes of outbreaks (7).

Assessment of sanitary condition of catering establishments were conducted in Addis Ababa in 1999. In this study 587 establishments were assessed among these about half of the establishments walls and ceilings repair condition were found to be poor condition and twelve percents of the establishments had no place to dispose of liquid waste; 341(58.1%) of the establishments dispose liquid waste simply into the city"s road drains. (8).

Despite the increasing number of food catering establishment in Addis Ababa, the sanitary condition of food catering establishment is not studied sufficiently. No study has been conducted in Addis Ketema Sub City despite Addis Ketema is the City‟s center of largest open market-Merkato area and where the Bus Station of that goes to the countryside is located.

1.3 Significance of the study

Assessments of sanitary conditions of food catering establishments have not been studied sufficiently in Addis Ababa City Administration. Furthermore, there is no study that examined the washing efficiency of food utensils through microbiological quality test in food catering establishment found in Addis Ababa.

The finding of this study can generate information that can help Addis Ababa City administration and other relevant stakeholders to understand the level of sanitary condition in the sub cities and help the regulatory efforts to improve sanitary conditions of food catering establishments. Also the finding of this study can be used as base line data for further study. The rating or grading of food catering establishments is also useful for environmental health inspectors to determine the inspection schedule as well as for enforcement action.

2 LITERATURE REVIEW

2.1 Food borne disease occurrence and hygienic status of catering establishments: In developed Country

Growing urbanization and lifestyle changes lead people to dine away from home more often, contributing to the unregulated opening of eating establishments that often have inadequate hygiene conditions. Although it is difficult to estimate the total burden of food borne illnesses, WHO finds that food borne diseases are on the rise in the European Region Since 1985, illnesses from Campylobacter jejuni have increased steadily. In several countries, this observed rise could be attributed to an improvement in diagnosis rather than increasing incidence. Most reported cases of campylobacteriosis occur sporadically, as single cases, or small family outbreaks. Although the incidence of salmonellosis is decreasing in several countries, WHO data show that Salmonella is still the most frequently reported cause of food borne outbreaks. It is responsible for about 75 percent of the outbreaks, of which one-third are caused by Salmonella Enteritidis, a hazard frequently linked to contaminated eggs. (9).

An assessment of the sanitary condition of food establishments and personal hygiene of food handlers was conducted in a rural area of western Maharashtra, India; on 25 food establishments rendering meals daily (breakfast, lunch and dinner) showed that piped water was the only source of water supply for all establishments. Separate kitchen and onsite solid waste storage containers/receptacles were available in 4(16%) establishments. Provision for heating devices for cooked food was available in 5(20%) establishments. Wash basin present with soap were available in 10 (40%) of the food establishments. In some of the food establishment‟s food preparation areas were unclean and not well repaired Ineffective washing techniques, improper handling and storage of clean utensils, rare changing of water used for washing plates, and use of dirty clothes to wipe and dry plates were some of the common practices in these food establishments (10).

2.2 Food borne disease occurrence and hygienic status of catering establishments: In the African region context

Even if data regarding food borne diseases in the African Region are extremely scarce, the following pathogens are prevalent: Campylobacter, Salmonella, Shigella, Hepatitis, Brucella, Staphylococcus aureus, Bacillus cereus, Escherichia coli, and rotavirus. Foodborne bacterial infections are particularly common (2).

Food elaborated with satisfactory hygienic standards is one of the essential conditions for promoting and preventing health, and inadequate control is one of the factors responsible for the occurrence of food borne disease outbreaks poor personal hygiene by food handlers frequently contributes to outbreaks of food borne illness caused by staphylococcus aureus (S.aureus) and gram negative bacilli such as Salmoonella spp., Shigella spp., Campylobacter jejuni, Enterotoxigenic E.coli as well as viral agents, such as hepatitis A, and Norovirus. The importance of hand hygiene in the control of infection cannot be under-emphasized Although hand-washing may seem trivial to the food staff, failing to do it can have tragic consequences. It is generally accepted that the hands of food handlers are an important vehicle of food cross-contamination and that improved personal hygiene and scrupulous hand washing would lead to the basic control of feces-to-hand to-mouth spread of potentially pathogenic transient microorganisms (11).

A study conducted in Alexandria, Egypt in 15 Grocery and dairy shops only 20% of these shops were acceptable concerning their hand washing facilities. Observing 29 food handlers revealed that only 3.4% of them were acceptable in their personal hygiene with a mean score percentage of only 31.0$\pm$9.2. Although the hand washing methods followed by the food handlers significantly decreased both aerobic mesophilic and staphylococci counts, they were still high. Moreover, fecal coli forms increased insignificantly from 5 to 7 MPN/100ml indicating that the hand washing was improperly done due several pitfalls. Most of the handlers who washed their hands for less than 10 seconds (41.4%) had higher counts of aerobic mesophiles and staphylococci than those who washed for more than 10 seconds. Most of the handlers (93.1%) did not avoid contamination from the tap after hand washing. Moreover, their hand washes were

contaminated with fecal coli forms (8 MPN/100ml) and with slightly higher staphylococci counts than those who avoid contamination either by rinsing a tap or closing it by elbows (11).

2.3 Food borne disease occurrence and hygienic status of catering establishments: In Ethiopia context

An assessment of sanitary conditions was conducted in Mekelle, Tigray in 420 mass catering establishments from the study One hundred forty four (60%) kitchens and 345(82%) dining/service rooms had windows that could be opened (and average of about 10% of the floor area). Only 75(31.4%) of the kitchens had a dressing room for food handlers. The majority, 407 (96.9%) of the establishments had toilet facilities. Only 35(8.6%) of those were found to have separate units for males and females. Municipal pipe water was the only source of water supply for all establishments with 393 (93.6%) establishments having access to privately owned water pipes. However, only 73 (31.7%) of the kitchens had access to running tap water inside the facility for food preparation and utensil washing, and only 6 (8.1%) had access to hot water supply. Onsite solid waste storage containers/receptacles were available in 408(97%) establishments. Municipal refuse collection containers were the most common type of solid waste collection methods employed by 372 (88.6%) of the establishments (12).

An assessment of Sanitary Conditions of Food Service Establishments and Food Safety Knowledge and Practices of Food Handlers study was conducted at Bahir Dar Town showed that from 455 subjects Sixty six percent of the establishments had flush toilets whereas 5.9% of the establishment had no toilet. Only 149 (33.6%) of the establishments had a proper solid waste collection receptacle and there was statistically significant association between the sanitary conditions and license status of the establishments ($p=0.01$) (13).

An assessment of sanitary conditions of public catering establishments was conducted at Zeway in 147 food and drink establishments showed that. A piped water supply was found in all establishments. About 59% of the establishments had some kind of human waste management means, dry pit latrine being the commonest. Liquid waste and refuse management were found to be grossly inadequate in 73.5% and 81% of establishments, respectively. Some kind of acceptable type of clients' hand washing, soiled dish and glass washing facilities were found in 29.9%, 66.6%, and 72.8% of establishments, respectively. Food handlers in 14.8% of

establishments had some form of active skin and respiratory infections. The personal hygiene of food handlers in most establishments was very poor and that only 21.65% of them had acceptable type of over coats used while working. The dining rooms and bed rooms were found to be in a relatively better conditions as compared to that of the food handling and processing. The licensing and inspection actions are positive enabling and reinforcing factors for improving mass catering environment (14).

2.4 Food borne disease occurrence and sanitary condition of catering establishments in Addis Ababa.

An assessment of sanitary condition of catering establishments was conducted in 587 Public Catering Establishments in Addis Ababa City. The study showed that the majority (70.5%) of the establishments had floors constructed of concrete tiles and in 1.7%, floors were found to be just plain earth. Adequate ventilation (having open able windows and chimney) was observed in 420(71.6%) of the rooms used for food preparation; 209(78.9%) of the rooms used for food storage, and in 568(96.8%) of the dining rooms. Four hundred and eighty-five (82.6%) of the establishments were found to have a receptacle to store solid wastes in their compound; in the remaining 17.4% of the establishments, a receptacle to store solid wastes were not available. In addition, 12.3% of the establishments had no place to dispose of liquid waste; 341(58.1%) of the establishments dispose liquid waste simply into the city"s road drains. In this study high proportion of public catering establishments were operate without any legal permission. Waste storage and disposal practices were observed to be significantly better in licensed establishments than in the unlicensed establishments and poor repair conditions had significant impact on the overall sanitary practices of catering establishments (15).

2.5 Hygienic requirements for catering establishments

Many countries recognize the need to control the opening of catering premises so as to ensure that before business commence they comply with the standard in force. Provision is usually made also for the closure of premises in the event of serious contravention of the law. The opening of premises is controlled in various ways. Sometimes a permit or license from the local health department is required and this may be revoked or suspended if the premises allowed falling in unsatisfactory condition. One large city requires an applicant for permit to complete

successfully a course of instruction in food protection conducted by the health department. Sometimes there is a system requiring premises to be approved before they are opened. In some countries control is achieved by the requirements that all catering establishments must be registered for practical purpose no real distinction drawn between licensing and registration although licensing is normally for a limited period and implies for periodical renewal of license (16).

Construction of premises (walls, floors and ceilings cleanliness Lighting and Ventilation system), Kitchen and food preparation site handling and cleanliness, Infestation of flies, availability of Washing basins/facilities for utensils & equipment, Bactericidal treatment of any eating and cooking utensils. Food handlers health and hygiene, availability of Refrigerators for storage of perishable food Adequate and whole some water supply from approved source, Adequate toilet and lavatory facilities for customers and workers, Conveniently located and accessible Showers for males and females Proper waste collection and disposal system (solid and liquid waste)are basic Sanitary requirements of catering establishments (16,17).

Food handlers' health and hygiene

Food handlers are a common source of food borne diseases. The practice of good personal hygiene is essential for anyone who handles food, especially in food and drink establishments where many customers could potentially be affected. A sick food handler with symptoms of diarrhea, eye and ear discharges, skin infections, open cuts and wounds, or coughing should not continue working. They must be treated and be completely recovered before returning to work (23).

Food handlers Personal Behavior

Food handlers engaged in food handling activities shall refrain themselves from smoking; spitting; chewing or eating; sneezing or coughing over any food whether protected or unprotected food and eating in food preparation and food service areas. The food handlers should trim their nails and hair periodically, do not encourage or practice unhygienic means while handling food (32).

Persons working directly with and handling raw materials or food products shall maintain high standards of personal cleanliness at all times. In particular: they shall not smoke, spit, eat or drink in areas or rooms where raw materials and food products are handled or stored; wash their hands at least each time work is resumed and whenever contamination of their hands has occurred; e.g. after coughing / sneezing, visiting toilet, using telephone, smoking etc.

Access to Water Supply

Food and drink establishments require a sustained source of safe water to be used for personal hygiene, food preparation and utensil cleaning. A water tank is one option to ensure the availability of water at all times (23).

Waste management

Food and drink establishments produce organic wastes such as food remains, and liquid wastes as a result of hand and kitchenware washing. These wastes need to be handled properly without contaminating or polluting the immediate environment (23).

Cleaning and Sanitizing Facilities

All food establishments shall provide sinks and drain-boards of sufficient size to permit the complete immersion of the largest utensils and each compartment of the sink shall be supplied with hot and cold running water. All said sinks shall have attached drain boards and shall be constructed of galvanized metal or better, suitably reinforced and of such thickness and design so as to resist denting, buckling, and sloped so as to be self-draining (32).

Maintaining hygienic kitchen equipment

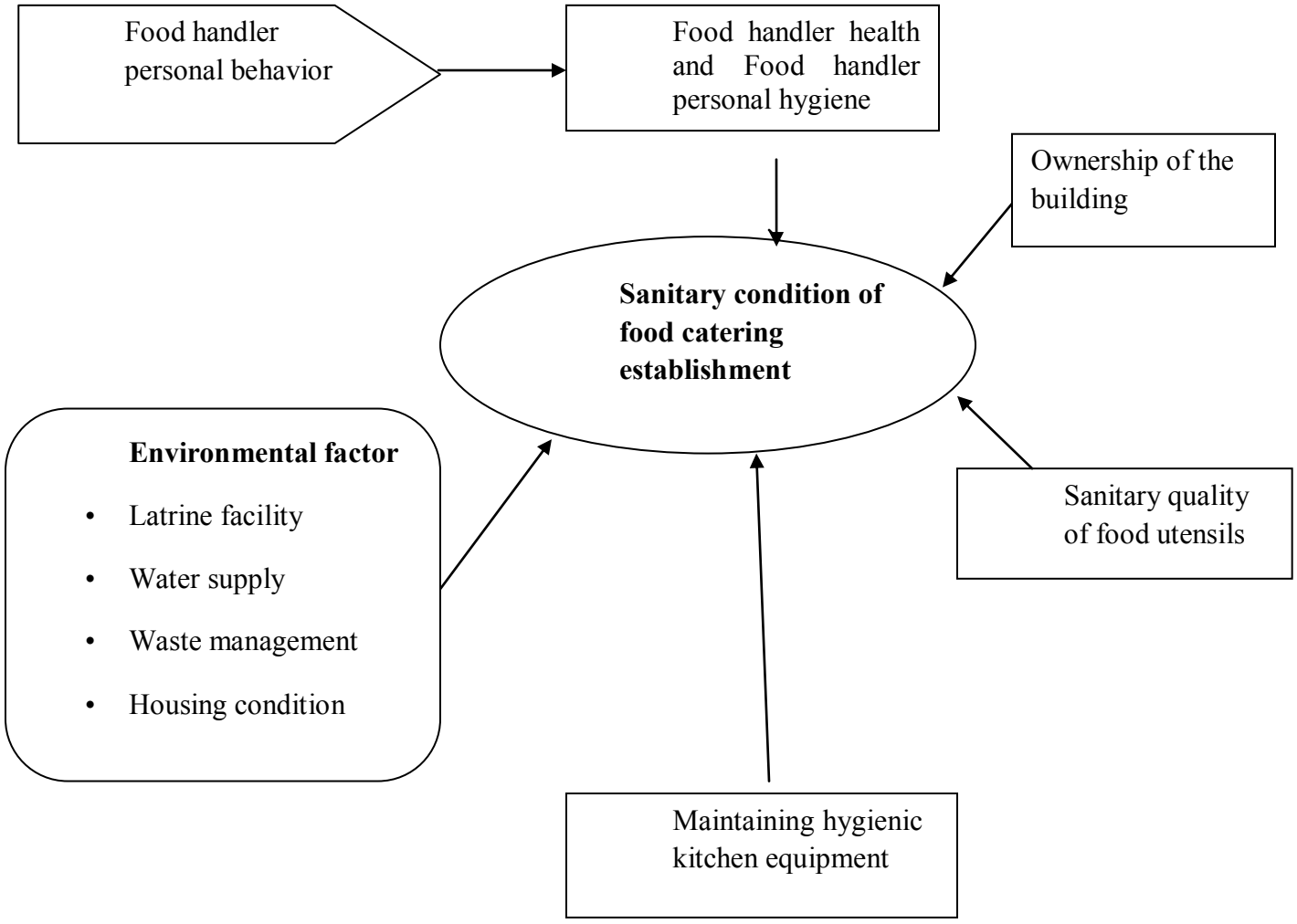
All surfaces that come into contact with food should be constructed of appropriate materials and are well-maintained. Any surface that is cracked, scored or has an irregular surface is difficult to clean and may harbor dirt. Chopping and cutting blocks for preparing meat or vegetables must be kept clean and covered. All utensils and equipment must be protected from possible contaminants including dust, dirt, insects, rodents and overhead drips. Equipment and food containers should be made of materials with no toxic effect and be designed to ensure that they can be easily cleaned, sanitized and maintained. Surfaces such as chairs and tables that do not

normally come into contact with food should also be clean and in good repair. Always use clean clothes to cover tables and change them whenever necessary (23).

Addis Ababa is a capital city of Ethiopia which has 10 sub city administrations and 116 woredas Addis Ketma Sub-City is one of the 10 Sub-Cities in Addis Ababa City Administration and it is the City‟s center of largest open market-Merkato area where the Bus Station of that goes to the countryside is located. Addis Ababa regional health bureau developed different guideline and public health proclamation to improve the sanitary condition of food and drinking establishments through performing regular monitoring and inspection of food and drinking establishments. The improper and inadequate liquid waste storage and disposal method identified in the majority of food catering establishments is believed to be the reflection of the general sanitary problems of the city. regular inspection of food establishments by the responsible regulatory body had a constructive pressure on the availability of the sanitary facility. The objective of this study is to assess the sanitary condition of catering food establishments, to examine the washing efficiency of food utensils through microbiological quality in Addis Ketema Sub-City, Addis Ababa City Administration. This paper is expected to provide baseline data to inform regulatory efforts to improve sanitary conditions within catering food establishments.

2.6 Conceptual framework

Figure 1: Factors that affect the sanitary condition of food catering establishments



3 Objective

3.1 General objective

- To assess the sanitary condition of food catering establishment in Addis Ketema Sub City, Addis Ababa City Administration.

3.2 Specific objective

- To assess the sanitary condition of food catering establishment.
- To examine the washing efficiency of food utensils through microbiological quality.

4 Methods

4.1 Study design

A cross sectional study was conducted to assess the sanitary condition of catering food establishments and examining the washing efficiency of food utensils through microbiological quality from March to April, 2014 in Addis Ketema Sub-City, Addis Ababa City Administration.

4.2 Study Area

Addis Ababa is a capital city of Ethiopia which has 10 Sub-City administrations and 116 Woredas. Based on the 2007 Census conducted by the Agency of Ethiopia (CSA), Addis Ababa has a total population of 2,739,551, of whom 1,305,387 are men and 1,434,164 women (18).

Addis Ketma Sub-City is one of the 10 Sub-Cities in Addis Ababa City Administration, which is found to the North Gulele, to the South Lideta, Kolfe to the West and Arada to the East and its area is 7.41 Sq.km. The Sub-City has 10 Woredas and a total population of 294,898 (male 141,551 female 153,347). In the Sub -City there are 1,728 different food catering establishments; from these, 309 hotels, 123 cafeterias, 337 restaurants, 575 tea/snack house, 185 pastry, 62 fruit and juice house, and 137 butcher shops (19).

Currently the Addis Ababa City Government Food, Medicine and Health Care Administration and Control Proclamation No.30/2012 issued a regulation among this part 10, sub- article (1) is about inspectors powers and duties. The Authority appointed inspectors to implement the provisions of the proclamation and other laws and directives related with the authority. An inspector appointed in accordance with sub- article (1) of this article shall have the powers and duties to:

a. Inspect and take measure on health and health related institution. and product transporters on working hours and any time if necessary.

b. When the existence of health risk is proved with evidence he can visit any building any compound, and can take necessary measures at any time depending on the inspection result.

4.3 Source Population

All food catering establishments such as Hotels, Restaurants, Cafeterias, Tea/Snack houses, Pastry, Butcher shops and Fruit and Juices houses in Addis Ketema Sub-City.

4.4 Study Population

Three hundred fifty two food catering establishment was assessed in Addis Ketema Sub-City, Addis Ababa City Administration.

4.5 Inclusion and Exclusion criteria

Inclusion

All Formal food catering establishments authorized and licensed by the local authorities such as hotels below crown hotel, cafeterias, restaurants, tea/snack house, pastry, fruit and juice house and, butcher shops were included in the study. Licensed food establishments included in order to find the actual information for this study and those establishments also expected to provide food service for large people.

Exclusion

Crown hotels, drinking service establishment and non-licensed Street food vendors or hawkers were excluded.

Establishments which provide service temporarily around market place and bus station and the like were excluded. Crown hotels are excluded because all crown hotels are assumed to fulfill the basic hygienic requirement or standards of food catering establishment and drinking service establishment also excluded because the risk of disease caused by food borne disease is high in food catering establishments than establishment that give only drinking service.

4.6 Operational definition

Crown hotel: is a chain of full service, upscale hotels catering to business travelers and to the meetings and conventions market (20).

Food catering establishments: provide food and drink services to a relatively large number of users in the form of breakfast, lunch, dinner or beverages. Formal food and drink establishments are authorized to practice this service after being licensed by the local authorities (21).

Restaurant: is food establishment that provide lunch and dinner with accompanying soft and alcohol drinks (22).

Cafés: provide hot drinks and snacks. Hot drinks include tea, coffee, milk, or a blend of milk and coffee (macchiato). The café must have water boiling equipment for coffee and tea preparation. Cakes and doughnuts (such as bumbling, chornake and sambusa) are served as snacks (22).

Tea/snack houses: provide tea and snacks. Snacks are usually plain bread, sambusa and bumbling. Tea is served after mixing with boiled water in a kettle (22).

A butcher's shop: is a food establishment that offers meat for sale (22).

A hotel: is a food establishment that offers food, drinks of all types, and bedroom services. The capacity of service and the quality of foods and bedrooms in a rural hotel are less than those of urban hotels (22).

Pastry: is the name given to various kinds of baked products made from ingredients such as flour, sugar, milk, butter, shortening, baking powder, and eggs (20).

Fruit juice: beverage and other fruit-related products produced by squeezing or crushing fruit (20).

Lavatory facility: proper wash hand basins with soaps (preferably automatic/foot operated) near toilets & around dining rooms and areas where food is prepared (23).

Temporary food catering establishments: these are establishments temporarily organized as a result may lack adequate sanitary facilities like permanent water supply, toilet, and fixtures for food preparation and storage, and sewage system etc...Such establishments are observed in special ceremonies for example; Church ceremonies, picnics, weddings, and other special occasions (21).

Proper refuse receptacles: garbage or refuse which is kept clean, leak proof nonabsorbent containers equipped with tight fitting covers (23).

Certificate of Competence: means a work license issued for a person to carry out food, medicine, health or health related services or trade in accordance with standards set (24).

Dish washing facility: Is a type of sink or bucket which has hot or cold water with detergent used for sanitizing food utensils or equipments.

Refuse container: Sufficient watertight covered metal containers used to receive for storage until collected all accumulation of garbage, petrescible waste, rubbish or other waste (23).

Hand washing facility for clients: Means proper hand washing basin with soap near toilets and around dining rooms

Hand washing facility for workers: Means proper hand washing basin with soap in the areas where food is prepared.

Shower for workers: Availability of shower in catering food establishments for male and female workers.

Sanitary inspection in the last one year: Means the number of inspection made by Woreda or Sub-City Health Office Environmental health inspectors in catering food establishments within the last one year.

Running tap water: means a connection sustained source of safe municipal tap water that is used for personal hygiene, food preparation and utensil cleaning.

Toilet facility: is a proper toilet seats which are easily to clean not in near proximity and not opening to dining rooms or areas where food is prepared (21).

4.7 Variables

Dependent variables: - Sanitary condition of food catering establishments

Independent variables:

Sanitary facilities such as toilet facility, lavatory facility, dish washing facility and the like

Sanitary quality of food utensils

Maintaining hygienic kitchen equipment

Food handlers‟ health and hygiene

4.8 Sample size determination

The sample size was computed using the following statistical formula of single population proportion.

1. **$n = \frac{(Z\alpha/2)2 * P(1-P)}{d2}$**

Where

n= Total number of food catering establishments in Addis Ketema Sub City

Z= the standard normal deviation corresponding to the specific confidence interval (1.96)

P= the prevalence of sanitary condition of catering establishments in Addis Ababa studies was 45% (p=0.45)

$n = \frac{(1.96)2 \times (0.45) \times (1-0.45)}{(0.05)2}$

n=373

- The initial sample size was calculated using population correction. Therefore, the corrected sample size was 335

n=335+ (5% contingency) => n= 352

4.9 Sampling technique

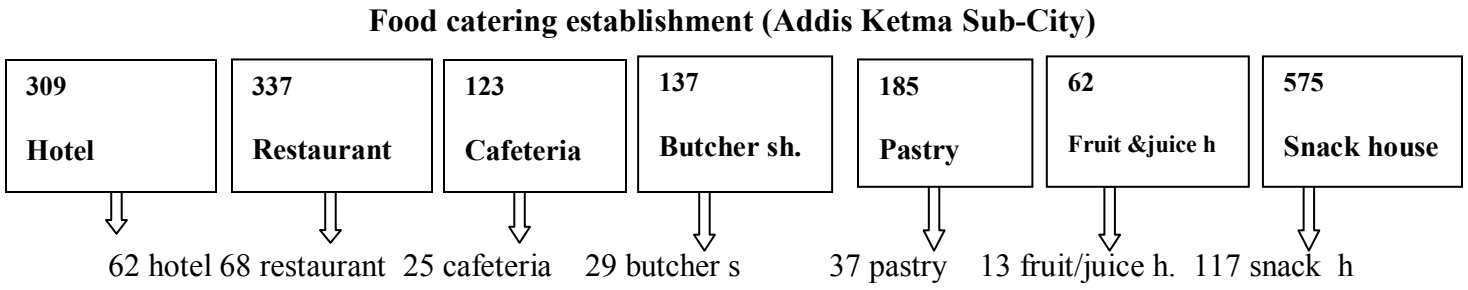
First five woredas were selected from ten woredas in the Sub-City based on their physical address that the number of catering food establishments located in the ten woredas. Then Stratified random sampling method followed by population proportion to size allocation was used. The sampling frame (list of licensed establishments) data was taken from Addis Ababa Trade and Investment bureau. A sample size of 352 was calculated based on the assumption of 5% expected margins of error, 95% confidence level (Z∞/2) and 5% contingency for non-responsive.

The establishments were stratified by the type of service they provide into the following strata: hotel, restaurant, tea or snack house, cafeteria, butcher shop, pastry shops, and juice vendor. The main purpose of stratification was to avoid over or underrepresentation of certain types of establishments.

The initial sample size for microbiological swab test was fifty two but due to shortage of resources the sample size was reduced from the planned 52 to 38 so among enrolled food catering establishments 6 Cafeterias, 11 Restaurants, 13 Hotel and 8 Tea/Snack houses were the selected catering establishments for microbiological swab tests. Food utensils were randomly selected by using a simple random table from a stack of utensils that were shelved at the time of data collection for microbiological swab test.

4.10 Sampling procedure

Figure2. **Sampling strategy of food catering establishments in Addis Ketema Sub-City, Addis Ababa**



Sample size 352

4.11 Sampling procedure for microbiological examination of food utensils

(See Annex 1, Laboratory procedure page 56)

The dish plates or bowels were randomly selected by using a simple random table from the shelves or other places where they stored from enrolled food catering establishments for swab test. For each group of food utensils three dish plates or bowels were selecting and swabbing on sterilized cotton swab on wooden applicator stick was used. By using moist cotton swab of the selected plate were rubbed slowly and firmly 3 times reversing the direction.

The samples were collected during the morning within10am-11am o'clock and in the afternoon within 2:30pm-3:30pm the required representative sample or utensils were ready at this time. Sterile normal saline was used to moisten the applicator stick. The vials filled with sterile normal saline were used as a transport media as swabbed cotton was rinsed in the content of the vials. Each vial was labeled with its own code number. The swabbed samples were transported to laboratory using ice box within one and an half hours.

4.12 Requirements for rating food catering establishments

The ratings of food catering establishments were done by using food establishment requirement standards in the US. **For example** in New York City every food service establishment receives an unannounced, onsite inspection at least once a year to check if it is meeting Health Code food safety requirements. The inspector may visit anytime the restaurant is receiving or preparing food or drink, or is open to the public (17).

Methods of grading catering food establishments in USA.

Certain types of food service establishments including restaurants, coffee shops, bars, nightclubs, and most cafeterias and fixed-site food stands must post letter grades that correspond to their sanitary inspection. A score of 0-13 results in a grade of A; 14-27 points, a B; and 28 or more points, a C. An establishment receiving a B or C grade on re-inspection receives two cards: one showing the letter grade and one that says Grade Pending; one of those cards must be posted immediately. The final grade is determined at the Administrative committee. The frequency of inspections depends on a restaurant‟s score. Restaurants with A grades are inspected less often than those with B or C grades. Frequent inspections of poorer-performing establishments enable the Health Department to closely monitor their food safety practices, while giving them more opportunities to improve their grades (17).

FOOD SERVICE ESTABLISHMENT SANITARY REQUIREMENT OR PARAMETERS

- Food not cooked to require minimum temperature.
- Whole frozen poultry or poultry breasts, other than a single portion, are being cooked frozen or partially thawed.
- Food prepared from ingredients at ambient temperature not cooled to 5°C or below within four hours.
- Eggs found dirty/cracked; liquid, frozen or powdered eggs not pasteurized.

- Food Protection Certificate (FPC) not held by supervisor of food operations.
- Food worker prepares food or handles utensil when ill with a disease transmissible by food or has exposed infected cut or burn on hand.
- Food, food preparation area, food storage area or area used by employees or patrons contaminated by sewage or liquid waste.
- Unprotected potentially hazardous food re-served.
- Appropriately scaled metal stem-type thermometer or thermocouple not provided or used to evaluate temperatures of potentially hazardous foods during cooking, cooling, reheating and holding.
- Evidence of rats or live rats present in facility‟s food and/or non-food areas. Rats present in the facility‟s food or non-food areas.
- Food contact surface improperly constructed or located; or unacceptable material used.
- Insufficient or no refrigerated or hot holding equipment to keep potentially hazardous foods at required temperatures.
- Personal cleanliness inadequate.
- Food not protected from potential source of contamination during storage, preparation, transportation, display or service.
- Facility not vermin proof.
- Pesticide use not in accordance with label or applicable laws. Prohibited chemical used/stored.
- Plumbing not properly installed or maintained; anti-siphonage or backflow prevention device not provided where required; equipment or floor not properly drained; sewage disposal system in disrepair or not functioning properly.
- Accurate thermometer not provided in refrigerated or hot holding equipment.

In this study context basic requirements were taken in order to rate food catering establishments then gave a point for each requirement from 1 to 5 points according to the fulfillment of the requirements then if the establishment got 47 points out of 55 points (85%) will score good, 38-47 points (70% to 85%) will score medium and less than 38 points (70%) will score poor (25).

Basic Sanitary requirements of food establishments

1. Construction of premises (walls, floors and ceilings cleanliness Lighting and Ventilation system),
2. Kitchen and food preparation site handling and cleanliness (handling of foods, hygienic condition of the room, cleanness of the utensils and processing equipments),
3. Infestation of flies,
4. availability of Washing basins/facilities for utensils & equipment,
5. Bactericidal treatment of any eating and cooking utensils (Approved bactericidal treatment after cleaning: Immersed 2 minutes in boiling water for one half minutes or kept in steam cabinet 15 minutes).
6. Food handlers health and hygiene (wear appropriate over coat and hair cover, the hygienic practice of personal hygiene and approved medical checkup certificate),
7. availability of Refrigerators for storage of perishable food Adequate and
8. whole some water supply from approved source,
9. Adequate toilet and lavatory facilities for customers and workers,
10. Proper waste collection and disposal system (solid and liquid waste
11. Conveniently located and accessible Showers for males and females

4.13 Data collection procedure

A standard questionnaire was developed based on the objective of the study after reviewing relevant literature and locally available materials to obtain information on socio-demographic characteristics of establishment owners/managers and sanitary condition of food catering establishment. Two methods of data collection were used

1. Interviews with food establishments owner/manager to collect data on socio-demography

Face to face interviews utilizing trained environmental health professionals interviewers were carried out from March to April, 2014 utilizing a standardized questionnaire. The questioner was prepared in English and translated in to Amharic. Interviews was carried out using the Amharic questionnaire. **Socio-demography** part had one section and comprised 7 questions

2. Observations to collect data on assessment of catering food establishments

Data on sanitary condition of catering food establishments was collected using an observation checklist. Twelve critical elements to assess sanitary condition of catering food establishments were listed on the observation checklist. Observations of sanitary condition of catering food establishments such as physical conditions of the premises (conditions of the wall, ceiling and floor), toilet facility, availability of water supply, solid and liquid waste management, dish washing facility and the like were collected by senior environmental health professionals. the data collectors were trained by researcher in collaborate with head of Addis Ketema Sub-City Health office but before giving the training to data collectors the head of Addis Ketema Sub-City Health Office assigned the collectors and the purpose of the study was described by supportive letters written from Department of Public Health Addis Ababa University. A researcher were supervises or facilitate the data collection.

Laboratory investigation

Among enrolled food catering establishments 6 Cafeterias, 11 Restaurants, 13 Hotel and 8 Tea/Snack houses were the selected catering establishments for microbiological swab tests. The samples of swap test were collected by researcher go together with data collectors but the researcher was managed and coordinates the overall activities of the swap test procedure and the swabbed samples were collected and transported to laboratory using ice box within one and an half hours by the researcher

4.14 Data management

The principal investigator was closely observed and coordinates the overall activities of the study project and data quality was checked by regular supervision and reviewing the completeness and consistency of questionnaires on a daily basis. Data collectors or environmental health professionals were assigned to collect data from establishments other than their permanent work place or catchment‟s area in order to minimize interviewer bias. What's more to rating the status of food catering establishment those data collector or environmental health professionals were trained to minimize the bias before data collection.

4.15 Data quality

Data quality was maintained by reviewing the completed forms by the researcher daily. Five Environmental health officers were recruited for data collection and supervision. Data collectors and supervisors were trained for 3 days on the purpose of the study, the format of the questionnaire, Swab test procedure and data quality management.

Response Rate

One of the randomly selected catering food establishment refused to cooperate to participate during the informed consent process. The response rate was thus 99.7%.

4.16 Data analysis

The collected data was cleaned and entered by developing a template using Epi info 3.5.3 and the sanitary condition of food catering establishments were analyzed by using SPSS version 16 Software. Frequency distribution and percentages were analyzed using descriptive statistics. Microbiological swab test analyses of food utensils were done in Addis Ababa City administration health bureau health research and laboratory service (Zewditu Hospital). Afterward different Medias were used to isolate the bacteria from swabs of Kitchen utensils.

Mannitol Salt Agar

Use: for the selective isolation, cultivation, and enumeration of staphylococci from clinical and nonclinical specimens.

Deoxycholate Citrate Agar

Use: For the selective isolation and cultivation of enteric pathogens, especially Salmonella and Shigella species.

MacConkey Agar,

Use: For the selective isolation, cultivation, and differentiation of coliforms and enteric pathogens based on the ability to ferment lactose. Lactose-fermenting organisms appear as red to pink colonies. Lactose-non fermenting organisms appear as colorless or transparent colonies.

Sheep Blood Agar

Use: For the cultivation and differentiation of bacteria based on their ability to utilize citrate as a carbon source. In addition to this, Biochemical reagents such as Kovac‟s reagent (Idole Test) and Hydrogen Peroxide (H_2O_2) were used for catalase test.

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4.17 Ethical Consideration

Ethical approval and clearance was obtained from Department Research and Ethical Review Committee and ethically was cleared by Institutional Review Board (IRB), Faculty of Medicine; Department of Public Health Addis Ababa University. Official permission from the study site was obtained and written informed consents were also obtained from study participants or from establishment‟s owners/managers. An official letter of permission was obtained from Department of Addis Ababa university School of Public Health to Addis Ababa city administration Addis Ketema sub city health office. Establishment‟s Owners/Managers were well informed about the purpose of the study and requested to collect the data through written consent. Privacy and confidentiality were maintained during the study process. The right of respondent to participate or not in the study was ensured during data collection by giving an opportunity to consent for refuse or take part in the study.

4.18 Dissemination of results

The finding of the study will be disseminated to department of Addis Ababa University School of Public Health and different stakeholders such as Addis Ketema sub city health office, Ethiopian Food, Medicine, Health care Administration and Control Authority (EFMHACA) and other relevant offices.

5 Results

Socio-demographic characteristics of study population

A total of 352 food catering establishments were identified in the study. Non response rate was negligible 1 (0.3%). Food service providing establishments were included in the study 62(18%) hotels, 68 (19.3%) restaurants, 117(33.3%) snack house, 25(7%) cafeterias, 29 (8.2%) butcher shops, 13 (3.7%) juice shops and 37(10.5%) pastry shops.

Among 351 establishments 348 (99.1%) were licensed and only 3(0.9%) were unlicensed. From three hundred fifty one food establishments 269(84%) were found to be inspected by the sub-city and woreda health office in 2014. Two hundred thirty eight (67.8%) of the establishment owners were providing the services in rented buildings. The rest 113 (32.2%) of the establishments were owned privately.

The median year of service of the establishments was 7 years, ranging from eight month to twenty two years. The median age of owners/managers was 45 years, ranging from 23 to 75 years. The majority, 279(79.5%) of the managers were literate those who educated primary level and above. 170 (48.4%) primary level, 86(24.5%) secondary level, 23 (6.6%) were degree; diploma and above. Only 72(20.5%) were illiterate. Regarding marital status, 282(80.3%) were married while the rest 69(19.7%) were single.

Table 1: **Socio-Demographic Characteristics of Owners/ Managers in Food Catering Establishment, Addis Ketema Sub-City, Addis Ababa, May 2014 (n=351)**

Characteristics	No.	Percent
Age		
23-38	135	38.5
39-53	162	46.2
54-68	48	13.7
69-83	6	1.7
Sex		
Male	258	74
Female	93	26
Educational status		
Illiterate	72	20.5
Primary level	170	48.4
Secondary level	86	24.5
Diploma, degree and above	23	6.6
Marital status		
Married	282	80.3
Single	69	19.7
Ownership of establishment building		
Private	113	32.2
Rented	238	67.8

Table 2: **Sanitary facilities in Food Catering Establishment, Addis Ketema Sub-City, Addis Ababa, May 2014 (n=351)**

Characteristics	No.	Percent
Water supply		
Private installed pipe	302	86.0
Communal distribution	11	3.1
Buy from Privately installed pipe	38	10.8
Latrine facility		
Flush type	90	25.6
Dry pit latrine	187	53.3
Simple pit	20	5.7
Not available	54	15.4
Site location of latrine		
Separate from kitchen room	189	53.8
Not separated/near to the kitchen room	162	46.2
Solid waste final disposal		
Supplied to municipal service	309	88.0
Burn at the site	10	2.8
Disposed on the street	29	8.3
Thrown in to the river	3	0.9
Liquid waste final disposal		
Open dumping in the area	33	9.4
To Septic tank/latrine	139	39.6
Discharge to the river	99	28.2
Municipal storm water drainage	80	22.8
Lavatory facility		
Shower for food handler available	116	33
Shower for food handler not available	235	67
Hand washing basin available for client's	198	56.4
Hand washing basin not available for client's	153	43.6

Table 3: **Microbiological Swab test of food utensils in selected Establishments in Addis Ketema Sub-City, Addis Ababa 2014. (n=38)**

Type of identified Microorganisms	**Number of utensils**	**Percent**
Pathogenic staphylococci (S.aures)	42	36.8
Escherichia Coli	18	15.8
Other lactose fermented	24	21
Shigella species	12	10.5
No bacterial growth	18	15.8

A total of 69 dish plates and 45 different cups were examined for bacteriologic content. Three representative swab tests were taken from one dish plate or cups for the media of Mackonkey, DCA and Sheep Blood Agar then Escherichia Coli, Staphylococcus aureus, Shigella and Salmonolocise species were examined. Staphylococcus aureus were isolated from 42(36.8%) utensils, Escherichia Coli were isolated from 18 (15.8%) and 12(10.5%) Shigella species were isolated from the swabbed utensils but there was no growth of Salmonellosis. Other lactose fermented faecal coli form presence in 24(21%) of the examined food utensils.

N:B Three samples or three dish plates/cups were taken from each one of the establishments sampled for Microbiological Swab test. Therefore, number of dish plates/cups taken from 38 establishments were: 69+45=114

Physical conditions of the kitchen and dining room of food establishments:

Among three hundred fifty one establishments, 323 had kitchen room. Floor easily cleanable construction, smooth, good repair condition was in 272(77.5%) of establishments and the rest 79(22.5%) of the kitchen room were found to be earthen. while 274(78.1%) of the establishments walls and ceilings were found to be clean and good repair (no break/crack and plastered). One hundred forty-eight (42.2%) of the establishments had separate food storage rooms. One hundred twenty five (35.6%) had Adequate ventilation (having open able windows and chimney) in food preparation room. On the other hand, the dining room floors also assessed 159(45.3%) of the dining room floor were constructed of tiles, 39(11%) were concrete, 108(30.8%) were plastered stone/bricks, and the remaining four were earthen and wooden three earthen and one wooden.

Overall Sanitary conditions:

Toilet facility

The majority, 297 (84.6%) of the establishments had toilet facilities. However the toilets were not separately constructed from kitchen room. Only 189(53.8%) of the establishments were found to have separate the kitchen room from latrine. In 162(46.2%) of the establishments the toilets were found to have near to the kitchen room. The rest 54(15.3%) of the establishments had no toilet service.

Water supply

The majority, 302(86%) of the establishments installed privately owned municipal pipe water supply, 11(3.1%) of the establishments having access to Communal distribution water supply and the remaining 38(10.8%) of establishments having access to buy privately owned water pipes. Among the 351 food catering establishments, 234 (66.7%) of the kitchens had access to running tap water inside the facility for food preparation and utensil washing, and only 14 (4%) had access to hot water supply.

Solid waste disposal

Three hundred twelve (88.9%) of establishments had appropriate solid waste storage containers/receptacles placed in appropriate place, however, the receptacle/waste storage containers had no tight-fitting cover and disposed on street or thrown in to rivers

Lavatory facility

Shower for food handler were available in 116 (33%) establishments. hand washing basins for client's water troughs constructed of concrete and fixed with running tap water in 198(56.4%) establishments. Detergents like soaps were available for client's in 190(54.1%) of the lavatory facilities.

Washing basin facility for food utensils and equipment

Among establishments, which serve various types of meals and have kitchens, 309 (88%) had some kind of dishwashing facility. Of these establishments, 64(18.2%) used buckets for dish washing, 245(69.8%) used conventional types of sinks fixed with running tap water. Thirty four (9.7%) establishments used three-compartment dish washing facility, 221(63%) of

establishments used two compartments and the remaining 53(15.1%) establishments used a single compartment. 85(24.2%) of the establishments were used hot and cold water with detergent for sanitizing their dishes. 94(26.8%) of the establishments were used cold water and detergent and 83(23.6%) of the establishments used only local soap and cold water.

Sanitary condition of the rated food catering establishments

The food catering establishments were graded based on the Addis Ababa Health Bureau minimum basic requirements/standards set for catering food establishment. According to this requirements all catering food establishments in this study were rated. Thus, among three hundred fifty one establishments one hundred thirty two (37.6%) of the surveyed establishments had poor hygienic or sanitary conditions, 166(47.3%) of the establishments were found to be in medium hygienic or sanitary deficiencies and only 53 (15.1%) of the establishments were found be in good sanitary condition.

Food handler health and personal hygiene

Among the 351 catering food establishments in 244(69.5%) establishments their food handler had wearied appropriate over coat. Food handler nail short trimmed and clean were found in 295(84%) establishments and food handlers engaged in delivering food handle money were observed in 194 (55.3%). Food handlers‟ medical checkup certificate were found in 143(40%) catering food establishments.

6 Discussion

The proportion of catering establishments in Addis Ababa operating with a formal license certificate (99.1%) was higher than the findings of similar studies conducted previously in Addis Ababa (70.9%), Mekelle (91%) and Zeway (86.4%) (8, 12, 14). This could be due to the integrated effort of concerned regulatory organizations and strict rule and regulation of trade and investment bureau to operate with a formal license; however 41(11.7%) were giving other services in addition to its license.

The finding in this study was similar to the study conducted in Mekella concerning on food handlers‟ personal hygiene and food handling practices were found poor food handling practice and personal hygiene. Unhealthy food handles makes the spread of food borne diseases highly like in such establishments, unless corrective sanitary measures are put in place (12).

The percentage of establishments in Addis Ababa with toilet facilities (84.6%) was lower compare to Mekelle (97%), However, nearly one third (31.7%) of the available latrines were improperly managed in Mekelle (12).

The proportion of establishments in Addis Ababa with appropriate liquid waste management system(39.6%) was lower compare to the proportion in Mekelle (87.1%) but higher when it is compare to Awashe-Sebat Kilo Town, Afar (3%). Refuse management practice was better in this study compare to the previous studies conducted in Addis Ababa, Mekelle and Afar (12, 22).

The improper and inadequate liquid waste storage and disposal method identified in the majority of food catering establishments is believed to be the reflection of the general sanitary problems of the city. Only 139 (39.4%) places in the city are covered by the modern sewerage system disposed liquid waste properly.

The catering establishment premises, floors, wall and ceilings, were not clean as well as the lighting and ventilation system were not adequate in food preparation or kitchen room compare to the pervious study in Mekelle (12). Floor easily cleanable construction, smooth, good repair condition were in two hundred seventy two (77.5%) of establishments and the rest seventy nine (22.5%) of the kitchen room were found to be earthen. while 274(78.1%) of the establishments walls and ceilings were found to be clean and good repair (no break/crack and plastered). The spontaneous and crowded housing situation and the overall problem of their physical condition over the years were some of the reasons for the observed poor sanitary conditions.

The cleaning of soiled dishes is an important way of preventing communicable diseases. One of the most widely used and accepted methods of washing food utensils is the three compartment sink or vat system (15, 25). Among 232 establishments in Mekele one hundred seven (46.1%) establishments used three-compartment dish washing facility, 112 (48.3%) of establishments used two compartments and the remaining 13(5.6%) establishments used a single compartment. And in Awash-Sebat Kilo town, Afar Region, among 48 establishments four (8.3%) establishments used one compartment dish washing facility, 18 (37.5%) of establishments used two compartments and the remaining 26(51.2%) establishments used three-compartment dish washing facility. whereas in Addis Ketema Sub-City, Addis Ababa City Administration only thirty four (9.7%) establishments washed their food utensils using three-compartment, two hundred twenty one (63%) of establishments used two compartments and the remaining 53(15.1%) establishments used a single compartment. Thus, the practices of proper washing method of food utensils in Addis Ababa are lesser than the washing practices in Mekele and Afar (12, 22).

From this and previous study findings which was conducted in Mekelle, showed that there were unhygienic condition of food utensils. Ineffective washing techniques, improper handling and storage of clean utensils, rare changing of water used for washing plates, and use of dirty cloths/towels to wipe and dry plates are some of the factors that could contribute to the gross

contamination. Food handlers with skin lesions, respiratory infection and nose and eye discharge could have served as the source point for the presence of S.aureus on the plates. As S.aureus lives and flourishes in the human nose, throat and skin, the likelihood of recontamination of cleaned plates by infected food handlers is quite high (12).

This study also tried to rate the sanitary condition of food catering establishments based on Addis Ababa Health Bureau minimum requirements set for food and other related service rendering establishments and by referring the USA country food establishment requirements.

The selected basic requirements for food catering establishment in this study were construction of premises (walls, floors and ceilings cleanliness Lighting and Ventilation system), Kitchen and food preparation site handling and cleanliness, infestation of flies, availability of Washing basins/facilities for utensils & equipment, Bactericidal treatment of any eating and cooking utensils. Food handlers health and hygiene**,** availability of Refrigerators for storage of perishable food Adequate and whole some water supply from approved source, Adequate toilet and lavatory facilities for customers and workers, Conveniently located and accessible Showers for males and females Proper waste collection and disposal system (solid and liquid waste).

7 Strength and Limitation of the study

Strength of the study

- The study was conducted in Addis Ketema Sub-City which is the city"s center of largest open market-Merkato area and where the Bus Station of that goes to the countryside is located. Hence, there are a lot of food catering establishments located and give a service to large of people.
- Microbiological swab test of food utensils were done to strengthen the study. Thus, the finding in this study wills give the way for further detail investigation in this area.

Limitation of the study

The appropriate reagents and culture media for microbiological swab analysis were not found adequately as needed. Thus, the sample size of establishments with swab test was reduced from the planned 52 to 38 due to shortage of resources. Non response rate that occurred during assessment of sanitary condition of catering food establishments and shortage of resources, especially for swab test might affect the representativeness of the sample. Regarding the grading system, giving equal weight for all 11 basic requirements used in this assessment could affect the precision of the findings. However, future research could consider weighting of factors for better precision of the tool.

8 Conclusion

The sanitary condition of the food catering establishments in the study area was observed and found unhygienic and poor. Poor personal hygienic practice of food handlers, inadequate or poor repair condition of kitchens and inadequate ventilation, lack of standard dish washing compartments, and lack of hand washing lavatories for client's and improper disposal of liquid waste were major sanitary deficiencies identified in the study area.

From the examined food utensils Staphylococcus aureus were isolated from 42(36.8%) swabbed utensils, Escherichia Coli were isolated from 18(15.8%) and 12(10.5%) of the swabbed utensils were isolated Shigella species. Hence, the microbiological swab tests of food utensils confirmed the gross unhygienic condition of food establishments. In addition, only 143(40%) food handlers‟ had up-to-date medical checkup certificate; therefore, the likelihood of food contamination is very high in food establishments of Addis Ketema Sub-City. The provision of regular sanitary inspection had a constructive impact in improving the hygienic status of food establishments.

9 Recommendation

Based on the findings of this assessment, the following recommendations were addressed to the following institutions and organizations:

To FMHACA:

- Training about the requirements, the proclamation and other laws and directives of food catering establishments for food establishment owners, regulatory body and other relevant stakeholders shall be given by the Ethiopian Food, Medicine, Health care Administration and Control Authority.

To Addis Ketema Sub-city Health Office:

- During an issuing of certificate of competence emphasis should be given to the physical and structural design of the houses and to the availability of sanitary facilities.
- Appropriate regular inspection shall be strengthening by Sub-City and Woreda Health Offices to the fulfillment of food catering establishments to acceptable sanitary conditions. Especially food handler health condition, hygienic condition of food preparation area, food utensils and equipments hygienic condition need strict follow up because these were the main problem observed during the study.

To Federal ministry of trade:

- Federal ministry of trade shall strengthening the process of official registration of catering establishments in collaborate with Ethiopian Food, Medicine, Health care Administration and Control Authority (EFMHACA) during issuing and renewal of the licenses.

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11 Annex I Media Used to Isolate the Bacteria from Swabs of Kitchen Utensils

A. Mannitol Salt Agar

Composition per liter:

NaCl.....75.0g

Agar.....15.0g

D-Mannitol.....10.0g

Pancreatic digest of casein.....5.0g

Peptic digest of animal tissue.....5.0g

Beef extract.....1.0g

Phenol Red.....0.025g

PH 7.4 ± 0.2 at 25°C

Preparation of Medium: Add components to distilled/deionized water and bring volume to 1.0L. Mix thoroughly. Gently heat while stirring and bring to boiling. Distribute into tubes or flasks. Autoclave for 15 min at 15 psi pressure 121°C. Pour into sterile Petri dishes or leave in tubes.

Use: For the selective isolation, cultivation, and enumeration of staphylococci from clinical and nonclinical specimens. Mannitol-utilizing organisms turn the medium yellow.

B. Deoxycholate Citrate Agar

Composition per liter:

Sodium citrate.....50.0g

Agar.....15.0g

Lactose.....10.0g

Beef extract.....5.0g

Peptone.....5.0g

$Na_2S_2O_3 \cdot 5H_2O$.....5.0g

Sodium deoxycholate.....2.5g

Ferric citrate.....1.0g

Neutral Red.....0.025g

PH 7.3 ± 0.2 at 25°C

Preparation of Medium: Add components to distilled/deionized water and bring volume to 1.0L. Mix thoroughly. Gently heat and bring to boiling. Do not autoclave. Cool to 45°–50°C. Pour into sterile Petri dishes. Dry the agar surface before use.

Use: For the selective isolation and cultivation of enteric pathogens, especially Salmonella and Shigella species.

C. MacConkey Agar

MacConkey Agar: Demonstrates the ability of a gram negative bacterium to metabolize Lactose. MacConkey agar is both a selective and differential medium frequently used in culture testing. It contains crystal violet dye and bile salts, both of which inhibit the growth of most gram-positive bacteria. It contains lactose (a sugar) and neutral red indicator (a pH indicator which is yellow in a neutral solution, but turns pink to red in an acidic environment), which allow for differentiation. On MacConkey agar, Escherichia coli and Enterobacter aerogenes would ferment the lactose producing acid and would form colonies pink to red in color. On the same medium, Salmonella, Shigella, and Pseudomonas species would not ferment the lactose and would form off-white colonies. The red colored colonies show that acid was produced from lactose, meaning the bacteria could utilize lactose as a carbon source.

Composition per liter:

Pancreatic digest of gelatin.....17.0g

Agar.....13.5g

Lactose.....10.0g

NaCl.....5.0g

Bile salts.....1.5g

Pancreatic digest of casein.....1.5g

Peptic digest of animal tissue.....1.5g

Neutral Red.....0.03g

Crystal Violet.....1.0mg

PH 7.1 ± 0.2 at 25°C

Preparation of Medium: Add components to distilled/deionized water and bring volume to 1.0L. Mix thoroughly. Gently heat while stirring until boiling. Autoclave for 15 min at 15 psi pressure–121°C. Pour into sterile Petri dishes or distribute into sterile tubes.

Use: For the selective isolation, cultivation, and differentiation of coli forms and enteric pathogens based on the ability to ferment lactose. Lactose-fermenting organisms appear as red to pink colonies. Lactose-non fermenting organisms appear as colorless or transparent colonies.

D. Sheep Blood Agar

Use: For the cultivation and differentiation of bacteria based on their ability to utilize citrate as a carbon source.

E. Biochemical Test Media

1) Sulfide Indole Motility Medium (S.I.M Medium)

Use: For the determination of bacterial motility and the ability of bacteria to produce H2S andindole

2) Kligler Iron Agar Media

Composition per liter:

Peptone.....20.0g

Agar.....12.0g

Lactose.....10.0g

NaCl.....5.0g

Beef extract.....3.0g

Yeast extracts.....3.0g

Glucose.....1.0g

Ferric citrate.....0.3g

Na2S2O3 0.3g.....

Phenol Red.....0.05g

PH 7.4 ± 0.2 at 25°C

Preparation of Medium: Add components to distilled/deionized water and bring volume to 1.0L. Mix thoroughly, gently heat and bring to boiling, Distributed into tubes, Autoclave for 15 min at 15 psi pressure–121°C., Pour into sterile Petri dishes or leave in tubes.

Use: For the differentiation and identification of Endterobacteriaceae based upon sugar fermentation and hydrogen sulfide production. Sugar fermentation is indicated by the medium turning yellow. H2S production results in the medium turning black.

3) Urea Agar Media

Use: For the differentiation of members of the Enterobacteriaceae based on urease production. Urease-positive bacteria turn the medium pink.

4**) Citrate Agar Media**

Use: For the cultivation and differentiation of bacteria based on their ability to utilize citrate as a carbon source.

F. Biochemical Reagents used

1) Kovac‟s reagent (Idole Test)

2) Hydrogen Peroxide (H2O2) for catalase test Coli form Bacilli

They are distributed within the following genera:

1. Escherichia
2. Klebsiella
3. Citrobacter
4. Enterobacter

They are similar in:

a) Production of rose pink colonies on Mac Conkey‟s agar

b) Ferment sugars (Lactose) with production of acid and gas

Information sheet

Hello My name is---------- I am working with Mr. **Endalkachew Gurmu** who is doing research for partial fulfillment for the requirement of Master degree in Public Health at Addis Ababa University School of Public Health.

First of all I would like to say that, this questioner is designed to assess the sanitary condition of catering food establishments in Addis Ketema Sub-City, Addis Ababa City Administration. The study give information for Addis Ketema Sub-City Health Office to work hard to improve the sanitary condition of catering establishments as well as to prevent food borne diseases and other interrelated health problems.

I am going to ask you some questions and your response to the question will be important input to this study; thus, I would like to ask you give up your time to participate in the interview and your voluntariness to visit the establishments as well as the samples for swab test . Your name as well as the name of your establishment won't be written in this form and any information you give will be kept secret. Unless you are willing to participate in this study, you are not obliged to participate in the study.

Contact Address

PI : **Endalkachew Gurmu.**

Mobil --------0913326562
E-mail --------endalkgu@yahoo.com

መግቢያ

ስሜ ..... እባላለሁ የአዲስ አበባ ዩኒቨርስቲ የህብረተሰብ ጤና ት/ት ቤት የመጨረሻ ዓመት የሕብረተሰብ ጤና የማስትሬት ድግሪ ተማሪ የሆኑት አቶ እንዳልካቸው ጉርሙ ለሚያካሂዱት የምርምር ስራ በመረጃ ሰብሳቢነት በመሥራት ላይ እገኛለሁ፡፡ ምርምሩም በአዲስ ከተማ ክ/ከተማ በ5 ወረዳዎች በምግብ አገልግሎት ሰጪ ተቋማት ላይ በሚካሄደው የንጽና አጠባበቅ የዳሰሳ ጥናት በሚመለከት ለህብረተሰብ የምግብ አገልግሎት የሚሰጡትን ድርጅቶች በመስፈርቱ መሰረት ጉብኝት ማድረግና የድርጀቶቹን የሐይጅን/ንፅህና አያያዝ ሁኔታ በላብራቶሪ የተደገፈ ጥናት በማካሄድ የሚታዩ ችግሮችን ለመለየት ሲሆን፡፡ የጥናቱ ውጤት ጉዳዩ የሚመለከታቸው አካላት በድርጀቶቹ ላይ የሚስተወሉትን ንፅህናውን/ሐይጅን በጠበቀ መልኩ ለህብረተሰቡ የምግብ አገልግሎት እዲሰጡና ከዚህም ጋር ተያይዘው ለሚከሰቱ የምግብ ወለድ በሽታዎችንና ተዛማጅ የጤና ችግሮችን ቀድሞ ለመከላከል እንዲያስችል የሚረዳ ነው፡፡ ለዚህም መረጃ ለመሰብሰብ እንዲቻል ከክ/ከተማ ከወረዳ፤ ተገቢው ፍቃድ የተሰጠኝ ሲሆን የእርሶ ቤትም ጥናቱን ለማካሄድ ከተያዙት ድርጅቶች መካከል የተመረጠ መሆኑን በዚሁ አጋጣሚ ልገልጽልዎ እወዳለሁ፡፡

ስለሆነም በቃለ መጠየቁ በሙሉ ፍላጎትና በነጻነት እንዲሳተፉ በትህትና እየጠየቅኩ ቃለ መጠይቁ ጥቂት ጊዜ ሊወሰድ ይችላል፡፡ በቃለ መጠይቁ የሚሰጠኝ ምላሽ ሁሉ በሚስጢር የሚጠበቅና ምላሹም ለጥናቱ ዓላማ ብቻ የሚውል መሆኑን ላረጋግጥሎዎት እወዳለሁ፡፡ በቃለ መጠይቁ ውስጥ መልስ ለመስጠት ያልፈለጉበት ጉዳይ ካለ ማብራሪያ የመጠየቅ ወይም ሙሉ በሙሉ የማቋረጥ መብትዎ የተጠበቀ ነው፡፡

የጥናቱ ዋና አስተባባሪ ስምና አድራሻ፡-

እንዳልካቸው ጉርሙ

ሞባይል 0913326562

Consent form

Food establishment owner consent form (English and Amharic version)

(To be translated in to Amharic language)

Name of study participant: _____

It has been read the information sheet or the aim of the study to me. I have understood that it involves the study about the sanitary condition of food catering establishment in Addis Ketema Sub-city, Addis Ababa City Administration. I will be asked to provide information such as hygienic or sanitary condition of my food catering establishment. I have given my consent freely to participate in the study.

I_____ hereby give my consent for giving of the requested information to the researcher.

Participant"s signature _____ Date_____

Investigators signature _____ Date_____

Witness Signature

1. _____ Date_____

2._____ Date_____

የምግብ ቤት ባለቤቶችን ፍቃደኝነት መጠየቂያ ፎርም

ስለጥናቱ አስፈላጊ የሆኑትን መረጃ ተነቦልኝ አለማውም በ አዲስ ከተማ ክፍለ ከተማ አዲስ አበባ ውስጥ በምግብ ቤቶች ያለውን የሀይጅን/ንጽህና ሁኔታ ዳሰሳ ሲሆን ለጥናቱም አስፈላጊ የሆነውን መረጃዎችን ማለትም የድርጅቴን ሀይጅን ሁኔታ ተጠይቄ መረጃዎችን ጥናቱን ለሚያጠናው እሰጣለው፡፡

እኔ----------የተባልኩ በድርጅቴ የሚፈለገውን መረጃ ጥናቱን ለሚያጠናው እሰጣለው፡

በጥናቱ የተሳተፈው ስምና ፊርማ 1 …… ቀን…….

ጥናቱን የሚያጠናው ስምና ፊርማ 2…….. ቀን……

የመስካሪዎች ስምና ፊርማ 1…….. ቀን……

2…… ቀን……

12. ANNEX II ENGLISH VERSION QUESTINNERE

QUESTINNERE Code----//---------

S.N	Questions	Response	**Code**	**Score (point)** 1.exllent 2.very good 4.good 3.bad 4.very bad	**Remark/ defect**
1.1	Types of establishments	1. Hotel,	1		
		2.Cafeteria	2		
		3. Restaurant	3		
		4.Tea/snack house	4		
		5. Butcher shop.	5		
		6. Pastry	6		
		7.Fruit and Juice house	7		
1.2	Sex of manager/owner	1. Male	1		
		2. female	2		
1.3	Age of manager/owner	-------year	--		
1.4	Educational /literacy status of manager/owner	1. Illiterate 2. Primary level 3. Secondary level 4. Diploma, Degree and above	--		
1.5	Marital status of manager/owner	1. Single	1		
		2. Married	2		
		3.Divorced	3		
		4.Separated	4		
1.6	Manager of establishment	1. Owner	1		
		2. Relative	2		
		3. Employed	3		
1.7	Ownership of the establishment building	1. Private	1		
		2. Rented			
2.1	**Floor:** easily cleanable construction, smooth, good repair	Yes----- No-------	1 0		
2.2	**Walls and ceilings:** clean and good repair?	Yes ----- No-------	1 0		
2.3	**Doors and windows:** does screens,	Yes------	1		

	self-closing doors or fly-repellent fans and flies are absent?	No-------	0		
2.4	**Lighting:** does the room adequate lighting system artificial or natural?	Yes---- No-----	1 0		
2.5	**Ventilation:** does all rooms reasonably free of odors and condensation?	Yes---------- No----------	1 0		
2.6	Is the floor clean at time of visit	Yes---------- No----------	1 0		
2.7	Is the floor in good repair having no joints & cervices in which dirt"s can lodge?	Yes---------- No----------	1 0		
3.1	Does cleanness kept & free from visible dirt ,dust, soot & web of spider	Yes-------- No--------	1 0		
3.2	Is it maintained in good conditions, which have no joint ,hole, crack, in which dirt"s & insects can lodged	Yes------ No --------	1 0		
3.3	Is the kitchen provided with adequate lighting system?	Yes---------- No----------	1 0		
3.4	Is hood & chimney installed for ventilation	Yes---------- No----------	1 0		
3.5	Does the kitchen space serve for other purpose?	Yes---------- No----------	1 0		
3.6	Is any infestation of the kitchen observed at the time of visiting?	Yes--------- No----------	1 0		
3.7	If yes type?	1. Flies	1		
		2. Rat	2		
		3. Cockroach	3		
		4. Other (specify)…	4		
3.8	Is processing equipment cleanness kept & free from visible dirt & filth?	Yes ---------- No----------	1 0		
3.9	Is there connection of running water in the kitchen for preparation & washing equipment?	Yes ---------- No----------	1 0		
3.10	Does cooked food handled properly in kitchen kept in sealed Conditions to prevent access from insect & open environment?	Yes ---------- No----------	1 0		
3.11	Waste handling in kitchen, are appropriate refuse receptacles which	Yes---------- No----------	1 0		

	is tight & fight for cover proved in kitchen?				
4.1	Is a refrigerator available for storage of perishable food stored together?	Yes------ No----------	1 0		
4.2	Does the refrigerator have fixed thermometer reading?	Yes ------- No----------	1 0		
5.1	Does the establishment have separate store room?	Yes------- No----------	1 0		
5.2	Does the room free from moisture & dust?	Yes------ No----------	1 0		
5.3	Does the room infested with insect during visit?	Yes------ No----------	1 0		
6.1	Type of floor	1. Tile	1		
		2. Concrete	2		
		3.Wooden	3		
		4.Plastered stone/bricks	4		
		5.Earthen	5		
6.2	Does floor repaired in conditions which have no cracks & cervices in which dirt‟s can lodge?	yes ---------- No----------	1 0		
6.3	Lighting of dining room	1,Adequate	1		
		2.in adequate	2		
6.4	Wall type	1.Smooth Easily cleanable	1		
		2. Rough surface	2		
		3. Others(specify)----------	3		
6.5	Does cleanness of the wall kept at time of visit?	Yes ---------- No----------	1 0		
6.6	Does the ceiling maintained in good condition	Yes ---------- No----------	1 0		
6.7	Is cleanness of ceiling kept & free from dust, soot & web of spider?	Yes---------- No----------	1 0		
6.8	Do all workers engaged in delivering food handling wear hair cover?	Yes ---------- No----------	1 0		
6.9	Do all workers engaged in delivering food handle money?	yes ---------- No---------	1 0		
7.1	Does the worker wear appropriate	Yes---------	1		

	over coat?	No----------	0		
7.2	Does the worker wear appropriate hair cover?	Yes -------- No----------	1 0		
7.3	Do nail short trimmed & clean?	Yes -------- No----------	1 0		
7.4	Cleanness of over coat & visible body during visit?	1. Kept ----------	1		
		2. Not kept----------	2		
7.5	Discharge from nose, eye, ear & cough during visit?	1. Not observed 2. Observed	1 2		
7.6	Any visible cut & wound seen	1. Plastered with water impermeable bandage	1		
		2. Openly left	2		
		3.others (specify)----	3		
7.7	Wear of any jewelry or ring at time of visit	1. Observed	1		
		2. Not observed	2		
7.8	Does nail paint observed?	Yes -------- No----------	1 0		
8.1	Source of the water for the establishment.	1. Privately installed from municipal supply	1		
		2. Communal distribution	2		
		3. Buy from privately installed pipe	3		
		4. Others(specify)----	4		
8.2	Is there any tanker for storage of water for shortage time?	Yes------ No----------	1 0		
9.1	Types of toilet	1. Flush type	1		
		2. Dry pit/latrine	2		
		3. Others(specify)----	3		
9.2	Separation for males & females	Yes------ No----------	1 0		
9.3	Number of seats	----------	--		

9.4	Separation from kitchen room	Yes-------- No--------	1 0		
9.5	Is the latrine clean & comfortable to use at time of visit?	Yes------ No----------	1 0		
9.6	Flies infestation at time of visit	1.Not seen	1		
		2.seen	2		
9.7	Does hand wash basin provided to use after toilet near toilet?	Yes------ No----------	1 0		
9.8	Is soap provided for hand washing	Yes------ No----------	1 0		
10.1	Is there shower availability for workers	Yes------ No----------	1 0		
11.1	Is there basin for washing of utensils used for food & drinking displaying & preparation?	Yes------ No----------			
11.2	If present, how much is its compartment?	1. One			
		2. Two			
		3. Three			
11.3	What type of?	1. Fixed smooth surface with water tap			
		2. Fixed rough concrete with water tap			
		3. Dish bowls/bucket			
		4.other(specify)----------			
11.4	Cleanness of the basin & area around it.	1. Kept	1		
		2. Not kept	2		
11.5	Way of cleaning & sanitizing of utensils	1. Hot cold water & detergent used for cleaning	1		
		2. Only cold water with detergent used	2		
		3. Only hot & cold water used	3		
		4.only cold water used	4		

		5. Only local soap & \cold water used	5		
11.6	Do sanitized equipment‟s& utensils socked with sedex at the end?	Yes------ No----------	1 0		
11.7	Is there drying racks for sanitized & cleaned utensils?	Yes------ No----------	1 0		
11.8	Do utensils & equipment stored in containers, on shelves under conditions which can protect against contaminations?	Yes------	1		
		No----------	0		
12.1	Does appropriate refuse receptacles placed in appropriate place?	Yes------ No----------	1 0		
12.2	Do the receptacles fit to cover & fight?	Yes------ No----------	1 0		
12.3	Does the receptacles filled & splashed in the area in a manner that can aid spreading of flies?	Yes------ No----------	1 0		
12.4	Does the refuse transported to final disposal before over filling	Yes------ No----------	1 0		
12.5	Where does the refuse disposed at final?	1. Supplied to municipal service	1		
		2. Burn at the site (open burn)	2		
		3. Disposed on street	3		
		4. Thrown in to rivers	4		
		5. Other(specify)------	5		
13.1	Is there installation of drainage system for collection & handling of liquid waste?	Yes ---------- No----------	1 0		
13.2	If drainage system present what type?	1. Closed type which can collect all generated liquid waste	1		

		2. Open trench that can collect fraction of	2		
		generated waste 3.other(specify)----------	3		
13.3	Where liquid waste disposed at final?	1. Open dumping in the area	1		
		2. To septic tank	2		
		3. Discharge to the river	3		
		4. Other (specify)----------	4		
13.4	Is there stagnation of liquid waste due to blockage of careless handling which can aid fly breading & can affect sanitary condition of the establishment?	Yes ---------- No----------	1 0		
14.1	Year of services of the establishment	year-------- month ----------			
14.2	How much can be the average number of customers per day?	----------			
14.3	Does manager trained about basic food safety?	Yes ---------- No----------			
14.4	Visiting /inspection in the past with authorized body (environmental health professional)?	Yes ---------- No----------			
14.5	If visited how long often last visit?	Year---------- month----------			
14.6	Licensing status of the establishment?	1.Licensed ----------			
		2.Unlicenced			
14.7	If licensed	1. It gives service for which it is licensed			
		2. It gives other services exclusively			
		3.It gives other services in addition to its license			

13. ANNEX III AMHARIC VERSION QUESTINNERE

መጠይቅ ኮድ-----//----------

ተ.ቁ	መጠይቅ	ምላሽ	ኮድ	የተሰጠ ኘጥብ 1. እ.በ.ጥሩ 2. በጣም ጥሩ 3. ጥሩ 4. መጥፎ 5. በጣም በጥፎ	ምር መራ
1. አጠቃላይ መረጃ					
1.1	የድርጅቱ ዓይነት	1.ሆቴል	1		
		2.ካፌ	2		
		3. ሬስቶራንት	3		
		4.ሻይ/ቁርስ ቤት	4		
		5.ልኳንዳ ቤት	5		
		6.ሱፐርማርኬት	6		
		7.አትክልትና ጭማቂ ቤት.	7		
1.2	የድርጅቱ ባለቤት ፆታ	1.ወንድ	1		
		2. ሴት	2		
1.3	የድርጅቱ ባለቤት ዕድሜ	-------ዓመት	--		
1.4	የድርጅቱ ባለቤት የትምረት ደረጃ	1. ያልተማረ 2. የመጀመሪያ ደረጃ 3. ሁለተኛ ደረጃ 4.ዲፕሎማ፣ዲግሪእና ከዚያ በላይ	1 2 3 4		
1.5	የድርጅቱ ባለቤት የጋብቻ ሁኔታ	1. ያላገባ	1		
		2. ያገባ	2		
		3. አግብቶ የፈታ	3		
		4. የተለያየ	4		
1.6	ድርጅቱን የሚያስተዳደረው	1. ባለቤቱ	1		
		2. ዘመድ	2		

		3. ጠቀጣሪ	3		
1.7	ድርጅቱ	1. የግል	1		
		2. የኪራይ	2		
2. የሕንፃው ይዘትና ጤንነት					
2.1	**ወለል:**በቀላሉ ሊፀዳ የሚችል ያልተሰነጣጠቀ በደንብ ተጠናክሮ የተሰራ	አዎ---------- አይደለም-------	1 0		
2.2	**ግድግዳና ኮርኒሱ:**የፀዳ እና ያልተሰነጣጠቀ	አዎ---------- አይደለም-------	1 0		
2.3	**በርና መስኮቱ:** ስክሪን የተገጠመለት ለበራሪነብሳት የማያስገባ?	አዎ---------- አይደለም-------	1 0		
2.4	**የክፍሉ በርሃን ሁኔታ:** በቂ ብርሃን የሚያስገና የተፈጥሮና ሰው ሰራሽ	አዎ---------- አይደለም-------	1 0		
2.5	**የአየር ዝውውር:** ሽታ የሌለውና የአየሩ መቀት ከፍተኛ በሚሆንበት ወቅት ቬንትሌተር ያለው	አዎ---------- አይደለም-------	1 0		
2.6	በጉብኝት ወቅት ወለሉ የፀዳ ነው	አዎ---------- አይደለም-------	1 0		
2.7	በጉብኝት ወቅት ወለሉ የፀዳና ያልተሰነጣጠቀ በደንብ ተጠናክሮ የተሰራ ነው	አዎ---------- አይደለም-------	1 0		
3. የምግብ ማዘጋጃ ክፍል ሁኔታና የተዘጋጁ ምግቦች አያያዝ ሁኔታ					
3.1	ክፍሉ ንፁህ ቆሻሻ የሌለውና ከዝንብና ከትንኝ ነጻ የሆነ ነው	አዎ---------- አይደለም-------	1 0		
3.2	ግድግዳነ ኮርኒሱበቀላሉ ሊፀዳ የሚችል ያልተሰነጣጠቀና ያልተቦረቦረ በደንብ ተጠናክሮ የተሰራ ስክሪን በራሪነብሳት የማያስገባ ነው?	አዎ---------- አይደለም-------	1 0		
3.3	ክፍሉበቂ ብርሃን ሊያስገባ በሚችል መልኩ ነው የተሰራው?	አዎ---------- አይደለም-------	1 0		
3.4	ለአየርና ጭስ ማስወጫ ቺሚኒና ቬንትሌተር	አዎ---------- አይደለም-------	1 0		

	የተገጠመለት ነው				
3.5	ኩሽናው ለሌላ አገልግሎት የሚሆን ቦታ ያለው ነው	አዎ---------- አይደለም-------	1 0		
3.6	በጉብኝት ወቅት በራሪ ነፍሳት አለ	አዎ---------- አይደለም-------	1 0		
3.7	ካለ ምን አይነት ነፍሳት ነው	1.ዝንብ	1		
		2.አይጥ	2		
		3.በረሮ	3		
		4.ሌላ ካለ ይገለጽ	4		
3.8	የምግብ ማዘጋጃ እቃዋች ንጽህናቸውን የተጠበቀና በደንብ የተያዙ ናቸው	አዎ---------- አይደለም-------	1 0		
3.9	ለምግብ ማዘጋጃና እቃዎችን ለማጠቢያ ንጹህ የቧንቧ ውሃ የተገጠመለት ነው?	አዎ---------- አይደለም-------	1 0		
3.10	የበሰሉ ምግቦች ቆሻሻና በራሪ ነብሳት እንዳያገኘው ክዳን ያለው መደርደሪያ የተዘጋጀለት ነው?	አዎ---------- አይደለም-------	1 0		
3.11	ከምግብ ማዘጋጃ ክፍል ለሚወገዱ ደረቅ ቆሻሻ ማስወገጃ ክዳን ያለው ቆሻሻ ማጠራቀሚያ አለ?	አዎ---------- አይደለም-------	1 0		
4.	**ማቀዝቀዣያ**				
4.1	ቶሎ ለሚበላሹ ምግቦች ማስቀመጫ ሪፈሪጅሬተር አለ	አዎ---------- አይደለም-------	1 0		
4.2	ሪፈሪጅሬተሩ መቀቱን መቆጣጠሪያ መቀት ማንበቢያ አለው	አዎ---------- አይደለም-------	1 0		
5.	**የጥሬ እቃ ማስቀመጫ መጋዘን**				
5.1	ለጥሬ ዕቃ ማስቀመጫ የተለየ መጋዘን ያለው?	አዎ---------- አይደለም-------	1 0		
5.2	መጋዘኑ እርጥብ ያልሆነ እና አቧራ የሌለው ነው?	አዎ---------- አይደለም-------	1 0		
5.3	በጉብኝት ወቅት በራሪ ነፍሳት አለ	አዎ---------- አይደለም-------	1 0		

6. የመመገቢያ ክፍል					
6.1	የወለሉ ዓይነት	1.ታይል	1		
		2.ኮንክሪት	2		
		3.የእንጨት	3		
		4.ሊሾ	4		
		5.የዐፈር	5		
6.2	ወለሉ በቀላሉ ሊፀዳ የሚችል ያልተሰነጣጠቀ በደንብ ተጠናክሮ የተሰራ ነው	አዎ---------- አይደለም-------	1 0		
6.3	የብርሃን ሁኔታ	1.በቂ ብርሃን ያለው	1		
		2.በቂ ብርሃን የሌለው	2		
6.4	የግድግዳው ዓይነት	1.ያልተሰነጣጠቀ በቀላሉ የሚጸዳ	1		
		2.የተሰነጣጠቀበቀላሉ ማጽዳት የማይቻል	2		
		3.ሌላ ካለ የገለጽ---------	3		
6.5	በጉብኝት ወቅት ወለሉ ጸድቶ ነበር	አዎ---------- አይደለም-------	1 0		
6.6	ጣሪያው በደንብ ተጠናክሮ የተሰራ ነው	አዎ---------- አይደለም-------	1 0		
6.7	ኮርኒሱበቀላሉ ሊፀዳ የሚችል ያልተሰነጣጠቀና ያልተቦረቦረ በደንብ ተጠናክሮ የተሰራ ስክሪን በራሪነብሳት የማያስገባ ነው?	አዎ---------- አይደለም-------	1 0		
6.8	ሁሉም አስተናጋጆች የደንብ ልብስ ለብሰው ነው የሚያስተናግዱት?	አዎ---------- አይደለም-------	1 0		
6.9	ሁሉም አስተናጋጆች ሲያስተናግዱ ገንዘብ ይይዛሉ?	አዎ---------- አይደለም-------	1 0		
7. የምግብ አዘጋጆች የጤናና የግል ንጽህ ሁኔታ					
7.1	ሁሉም ምግብ አዘጋጆች የደንብ ልብስ ለብሰው ነው	አዎ---------- አይደለም-------	1 0		

	የሚያዘጋጁት?				
7.2	ሁሉም ምግብ አዘጋጆች የተሟላ የደንብ ልብስ የራስ ቆብ ለብሰው ነው የሚያዘጋጁት?	አዎ---------- አይደለም-------	1 0		
7.3	የእጅ ጥፍራቸውን በአጭሩ የተቆረጡና ንጹህ የሆነ ነው?	አዎ---------- አይደለም-------	1 0		
7.4	በጉብኝት ወቅት የደንብ ልብሳቸው ንጽህናው የተጠበቀ ነው	አዎ---------- አይደለም-------			
7.5	በጉብኝት ወቅት ከአፍንጫ ከዓይን ከጆሮ የሚወገድ ቆሻሻ ይታይባቸው ነበር	1.ይታይ ነበር	1		
		2.አይታይም ነበር	2		
7.6	በጉብኝት ወቅት እጃቸው ላይ ማንኛውም የሚታይ ቁስል ነበር	1.ውሃበማያሳልፍፕላስተር ተሸፍኗል	1		
		2.ክፍት ነው	2		
		3.ሌላ ካለ ይገለጽ------	3		
7.7	በጉብኝት ወቅት እጃቸው ላይ ምግብ በሚያዘጋጁበት ወቅት ቀለበት አስረው ነበር	1.አስረዋል	1		
		2.አላሰሩም	2		
7.8	የእጅ ጥፍራቸውን ቀለም ተቀብተዋል?	አዎ---------- አይደለም-------			
8. የውሃ አቅርቦት					
8.1	ድርጅቱ ውሃ የሚጠቀመው	1. የግል ከመስመስመር በተገናኘ የውሃ መስመር	1		
		2. በጋራ መስመር በተገናኘ	2		
		3.ከግል በመግዛት	3		
		4.ሌላ ካለ ይገለጽ----------	4		
8.2	ውሃ በሚጠፋበት ወቅት ለማጠራቀሚያ ታንከር/ሮቶ አለ?	አዎ---------- አይደለም-------	1 0		
9. የመፀዳጃ ቤት አገልግሎት					
9.1	የመፀዳጃ ቤቱ ዓይነት	1. ሽታ አልባ በውሃ ግፊት የሚሰራ			

		2.ሽታ አልባ የጉድጓድ			
		3. .ሌላ ካለ ይገለጽ----------			
9.2	ለወንድና ለሴት ተለይቶ የተዘጋጀ ነው	አዎ---------- አይደለም-------			
9.3	የመቀመጫው ብዛት	-----	-----		
9.4	መፀዳጃ ቤቱ ከምግብ ማዘጋጃ ክፍል ተለይቶ የተሰራ	አዎ---------- አይደለም-------	1 0		
9.5	በጉብኝት ወቅት መፀዳጃ ቤቱ ንጽህናውን የጠበቀና ለተጠቃሚ ምቹ ነበር	አዎ---------- አይደለም-------	1 0		
9.6	በጉብኝት ወቅት መፀዳጃ ቤቱ በራሪነብሳት እንዳያስገባ መከላከያ ወንፊት የተገጠመለት ነው?	አዎ---------- አይደለም-------	1 0		
9.7	የመፀዳጃ ቤቱ አጠገብ የእጅ መታጠቢያ የተገጠመለት ነው?	አዎ---------- አይደለም-------	1 0		
9.8	የእጅ መታጠቢያ ቦታ ሳሙና ተቀምጧል?	አዎ---------- አይደለም-------	1 0		
10. የሻወር አገልግሎት					
10.1	የሻወር አገልግሎት ለሰራተኞች አለ	አዎ---------- አይደለም-------	1 0		
11.የምግብ ማዘጋጃና ማቅረቢያ ዕቃዎች ማጠቢያ ሁኔታ					
11.1	የምግብ ማዘጋጃና ማቅረቢያ ዕቃዎች ማጠቢያ ሲንክ አለ?	አዎ---------- አይደለም-------	1 0		
11.2	ካለ ባለስንት የማጠቢያ ክፍል ነው?	1.ባለአንድ	1		
		2.ባለሁለት	2		
		3.ባለሶስት	3		
11.3	ምን ዓይነት ነው?	1. የቧንቧ ውሃ የተገጠመለት ሲንክ	1		
		2.በኮንክሪትየተሰራናውሃየ ተገጠመለት	2		
		3.የሳፋ ማጠቢያ	3		

		4.ሌላ ካለ ይገለጽ----------	4		
11.4	የእቃ ማጠቢያ ቦታ አካባቢ ንጽህናውን የጠበቀ ነው	አዎ---------- አይደለም-------	10		
11.5	ለእቃ ንጽህና/ማጠቢያ የሚጠቀሙበት ግብዓት	1.ሙቅና ቀዝቃዛ ውሃ ዲተረጀንት	1		
		2.ቀዝቃዛ ውሃና ዲተረጀንት	2		
		3. ሙቅና ቀዝቃዛ ውሃ ብቻ	3		
		4.ቀዝቃዛ ውሃ ብቻ	4		
		5. .ቀዝቃዛ ውሃና አጃክስ ሳሙና/ሆሞ	5		
11.6	ለእቃ ንጽህና/ማጠቢያ የሚጠቀሙበት ግብዓት በመጨረሻ በሴዴክስ ይጸዳል?	አዎ---------- አይደለም-------	10		
11.7	የታጠቡ እቃዎችን ማድረቂያ ራክ አለ?	አዎ---------- አይደለም-------	10		
11.8	የታጠቡ እቃዎች ክዳን ባለው ሼልፍ የተቀመጡ ናቸው?	አዎ---------- አይደለም-------	10		
12. የደረቅ ቆሻሻ አወጋገድና አያያዝ					
12.1	የደረቅ ቆሻሻ ማስወገጃ በአግባቡ የተዘጋጀ አለ?	አዎ---------- አይደለም-------	10		
12.2	የደረቅ ቆሻሻ ማስወገጃ ክዳን ያለውና ዉሃ የማያስገባ ነው	አዎ---------- አይደለም-------	10		
12.3	የደረቅ ቆሻሻ ማስወገጃ ክዳን የሌለውና ዉሃ ለትንኝ መራቢያ የተመቻቸ ነው?	አዎ---------- አይደለም-------	10		
12.4	ቆሻሻው በጣም ሳይሞላ ወደ ማስወገጃ ቦታ ይወገዳል	አዎ---------- አይደለም----	10		
12.5	የተጠራቀመው ቆሻሻ የት ነው የሚወገደው?	1. ለቆሻሻ ማስወገጃ በተዘጋጀ ገንዳ	1		

		2. ክፍት የሆነ ቦታ ላይ በመቅበር	2		
		3. መንገድ ላይ	3		
		4.ወንዝ ውስጥ	4		
		5. ሌላ ካለ ይገለጽ----------	5		
13.የፍሳሽ ቆሻሻ ማጠራቀሚያና ማስወገጃ ሁኔታ					
13.1	ለፍሳሽ ቆሻሻ ማጠራቀሚያ ድሬኔጅ የተዘጋጀ ?	አዎ---------- አይደለም----	10		
13.2	ምን ዓይነት የፍሳሽ ቆሻሻ ማጠራቀሚያ ድሬኔጅ ነው የተዘጋጀው?	1.ዝግ ሆኖ ፍሳሽ ቆሻሻ በአግባቡ የሚይዝ/በደንብ	1		
		ተጠናክሮ የተሰራ 2.በክፍት ተያይዞ የተሰራ	2		
		3. ሌላ ካለ ይገለጽ----------	3		
13.3	የተጠራቀመው ፍሳሽ በመጨረሻ የት ነው ሚወገደው?	1. ክፍት የሆነ ቦታ ላይ በመቅበር	1		
		2. በፍሳሽ ማስወገጃ ታንክር	2		
		3.ከወንዝ ጋር በማያያዝ	3		
		4. ሌላ ካለ ይገለጽ----------	4		
13.4	የፍሳሽ ቆሻሻ በአግባቡ የማይወገድና ፍሳሽ ቆሻሻ ያቆረና ለትንኝ መራቢያ የተመቻቸ የድርጅቱን ንጽህናውን የሚጎዳ ነው?	አዎ---------- አይደለም----	10		
14					
14.1	ድርጅቱ መች ነው አገልግሎት የጀመረው	ዓመት-------- ወር ----------			
14.2	በቀን ምን ያህል ደንበኞች ይስተናገዳሉ?	----------			
14.3	ባለቤቱ ስለምግብ ደህንነት ስልጠና ወስዷል?	አዎ---------- አይደለም----	10		
14.4	ድርጅቱ ከዚ ቀደም	አዎ----------	1		

	በጤና ተቆጣጣዎች ቁጥጥር ተደርጎ ያውቃል?	አይደለም----	0		
14.5	ከተጎበኘ ለምን ያህል ጊዜ?	ዓመት-------- ወር ----------			
14.6	ድርጅቱ ህጋዊ ፍቃድ አለው?	1.ፍቃድ አለው----------	1		
		2.ፍቃድ የለውም	2		
14.7	ፍቃድ ካለው	1. እንዲሰራ በተሰጠው ፍቃድ ነው የሚሰራው	1		
		2.ከተሰጠው ፍቃድ ውጭ ሌላ ተጨማሪ ስራ የሚሰራ	2		
		3. ሌላ ካለ ይገለጽ----------	3		

14. Annex IV Map of Addis Ketema Sub-City

NEW DIVISIONS OF WOREDAS OF ADDIS KETEMA SUB CITY ADMINISTRATION MAP 2002E.C