ADDIS ABABA UNIVERSITY PUBLIC HEALTH SCHOOL OF GRADUATE STUDIES College of Health Sciences

Assessment of the sanitary status of food and drink establishments in Addis Ababa city, a case of KIRKOS SUB-CITY; ADDIS ABABA ETHIOPIA

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Acronyms

AAFMHACA :	Addis Ababa Food Medicine and Health Care Administration and Control Authority
AAU-SPHGS :	Addis Ababa university school of public health Graduate Studies
EFMHACA :	Ethiopian Food Medicine and Health Care Administration and Control Authority
FBD :	**F**ood Borne Disease
FMoH :	Federal Ministry of Health
FMoT:	Federal Ministry of Trade
Ho.N :	House Number
TIN :	Tax Payer Identification Number
USFDA :	United States Food and Drug Administration
WHO:	World Health Organization

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Abstract

Background: Food borne diseases are major causes of morbidity and mortality globally, in urban areas food and drink establishments serve as source of ready-to-eat foods for large number of people. The sanitary handling of food establishment has public health relevance in terms of preventing food related diseases and intoxications.

Objective: To assess sanitary condition of food and drink establishment and associated factors, in Kirkos Sub City, Addis Ababa ETHIOPIA.

Method: A cross-sectional descriptive study was conducted from December 2013 to march 2014 in Kirkos Sub City, located at the center of ADDIS ABABA, With an area of 14.62 km^2 and population size of 245, 578. Three hundred sixty four food and drink establishments and owners/managers from these establishments were selected through stratification (by Woreda and type) and proportionate simple random sampling to be the study subjects. Data was collected using pretested and structured Amharic version questionnaire and observation checklist.

Results:- Among 364 food and drink establishments assessed in this study, highest were cafeteria 134(36.81%), followed by bar and/or restaurants 104(28.57%), fresh juice house 52(14.28%), hotels 34(9.34%), bakeries 25(6.86%) and the fewest 15(4.12%) were butchers. Construction/repair in past 2-5 years was done in only 180(49%) and among not maintained or constructed, 124(67.4%) reason for construction were due to urban plan requirements and no permission from renting body. overall kitchen cleanliness was highly associated with good repair condition of floor, wall and ceiling with OR=15.81(3.76,66.38 95 % CI), OR=14.24(3.39,59.28 95 % CI) and OR=15.85 (4.81,52.18 95 % CI) respectively. Access to private pipe water supply was strongly related to clean kitchen, availability of latrine and shower facilities with OR=5.48(1.65,18.13 95% CI), OR=24(6.64,91.01 95%CI) and OR=3.95(1.37,11.35) 95 % CI respectively.

conclusion :- overall sanitary status of establishments was found to be in poor status in majority of the establishments worse than assessed in other towns. Generally there should be Integration between the regulatory body and different City administration stakeholders. In

addition, the regulatory body shall focus on hygienic food handling promotion activities towards establishment mangers and food handlers. Routine sanitary inspections and health certificate of competence issuance activities need to be conducted continuously, periodically and should cover/reach all establishments.

Key words :- Kirkos sub City, food and drink establishments sanitary status, food premises, repair/construction, health certificate of competence and manager status.

1. Introduction

1.1 Background

Food borne disease takes a major toll on health. Thousands of millions of people fall ill and may die as a result of eating unsafe food (1). Food borne diseases (FBD) result from the ingestion of contaminated foods and food products and include a broad group of illnesses caused by bacteria, viruses, parasites and chemical agents and toxins, which contaminate food at different points along the farm to table continuum. Recent events surrounding melamine contamination in food have demonstrated, yet again, that food safety touches all our lives with national as well as international food borne disease outbreaks being reported almost daily (2).

Ethiopia, like many other countries is affected by burden of food-borne diseases due to contaminated foods. Major food safety concerns are caused by physical, chemical and microbiological contaminants due to poor hygienic practice during harvesting, transportation, processing and storage Condition n, etc. Many people especially in rural areas of Ethiopia die due to consumption of raw meat contaminated with Anthrax bacteria (Bacillus anthracis). A three-year data (2001-2003) of Addis Ababa also indicated Tuberculosis as the very common major food-borne zoonotic disease and Ascariasis as the second most popular food-borne disease in the region. A summary report on out-patient visits of the Ministry of Health indicates annual incidence of food-borne illnesses ranged from 3.4% to 9.3%, the median being 5.8% for the years 1985/86 to 1989/90. Among the major problems on the control of food-borne diseases are absence of comprehensive national food law and lack of up-to-date food safety regulations, sufficient food-safety code of practices, standards, guidelines, procedures, and lack of a single central and accredited food safety analytical and microbiological laboratory to support regulatory activities.(3)

1.2 Statement of the problem

Restaurants are important settings for food borne disease transmission (4). Multiple food borne illness outbreaks have been associated with the consumption of fresh produce (5). Known food borne disease outbreaks have been associated with foods served at commercial and noncommercial retail food stores and foodservice facilities including restaurants, clubs, assisted living facilities, nursing homes, child care centers, schools, and university foodservice

(6). According to results of similar study conducted in MEKELE town, "food provided to the consumers in the City was found less hygienic and had found poor sanitation conditions. General hygiene of food handlers, personal hygiene, sanitary facilities of food establishments, physical conditions of food catering establishments, disposal services, legal licensing and environmental hygiene was identified as the major sanitary deficiencies. Therefore, the probability of food contamination in these establishments was high due to poor sanitary conditions of the establishments and improper handling practice of food. (7)Moreover in public catering areas of densely populated places, like KIRKOS sub City, the problem is in worst condition mainly due to unsanitary condition of public catering, high density of the population, scarCity of land space for conformance of establishments buildings to hygienic guidelines of the City. the sub City hosts business, tourism, recreational, sport and construction activities on daily basis, hence high utilization of public catering places is observed in the sub City and the health of customers using food and drink establishments in the sub City is at high risk of food borne disease. Despite the high regulatory efforts undergone by the sub City health office through inspection and certificate of competence request visits, the sanitary and hygienic condition of the mass catering services remained poor and unhygienic(report from sub City health office). Most importantly there were no studies conducted in the sub City to assess the sanitary condition of food and drink establishment; hence the findings from this study can provide the basis for appropriate intervention and plan to minimize prevalence of food borne disease in the sub City.

1.3 Rational and significance of the study

Even though there are a number of similar studies conducted in different towns of Ethiopia; applicability of findings and recommendation of those studies to the current study area is difficult due to variation in reference time and existing particular environmental factors. Moreover this type of studies serve as a baseline survey indicating responsible factors for observed status to majorly the local district under consideration and the possible effective recommendation to be forwarded from the study differs in urban and rural contexts in which the activities take place. Hence applicability of those studies could be best achieved to places with similar set up.

kirkos sub City is located at the center of Addis Ababa, With an area of 14.62 km^2 and population size of 245,578. According to the sub City health office approximately there are 3027 food and drink establishments and more than 3 slum areas exist. Due to center location of the sub City to Addis Ababa City and various activities undergoing In this area, there is a high demand for food establishment services. Despite this high demand, the sub City is among the small sub cities with regard to the area it covered, hence available space for good sanitary status of food and drink establishments greatly hampered by limited space. Furthermore permit for construction or maintenance, ownership of the building, provision of sanitary municipal services and other socio-demographic related to owners/managers worsens the sanitary status of these establishments. Control of food borne disease from as such sources, requires a evidence based planning, implementation, continuous monitoring, and effective regulatory activities; which could only be achieved through organized assessment and analysis of the existing status of food and drink establishments and the environmental context at which they operate their service activities; unfortunately there were no such studies conducted in the current study area. The purpose of this paper is to explicitly explore general condition of food and drink establishment service in kirkos sub City and identification of responsible factors for existing condition of establishments.

The result from this thesis can serve as a baseline for further research, planning and implementation of effective intervention strategy specifically for kirkos sub City as well as other sub cities; contributing for reduction of food borne disease arising from food establishment services.

Literature review

Literature review was done through overview of principles of food hygiene and safety, global and local burden of food born disease, public health importance of catering places, local and abroad food and drink establishment studies, hygienic and safety requirements/practices for healthy food serving, existing regulatory standards and activities from internet sources (directly from Google and WHO food hygiene resources), books, articles and discussion with sub City health inspectors and information gathering from health office.

Global burden of food borne disease

People's lives depend on a reliable, safe food supply that is free from harmful contamination. Contamination is the state of being impure or unfit for use due to the introduction of unwholesome or undesirable elements. Food can be contaminated by insects, rodents, chemicals, microbes, or other foreign particles (8).

Food borne disease takes a major toll on health. Thousands of millions of people fall ill and many die as a result of eating unsafe food. The availability of safe food improves the health of people and is a basic human right. Safe food contributes to health and productivity and provides an effective platform for development and poverty alleviation. Up to one-third of the populations of developed countries are affected by food borne illness each year, and the problem is likely to be even more widespread in developing countries. The poor are the most susceptible to ill-health. Food and waterborne diarrheal diseases, for example, are leading causes of illness and death in less developed countries, killing an estimated 2.2 million people annually, most of whom are children. Diarrhea is the most common symptom of food borne illness, but other serious consequences include kidney and liver failure, brain and neural disorders, and death. The debilitating long-term complications of food borne disease include reactive arthritis and paralysis (1).

Source of food borne disease

Food borne illness is traced to inappropriate food handling practice (9). Most outbreaks were caused by food that has been mishandled or mistreated during preparation or storage (10). Careless handling, inadequate pretreatment, contaminating environment, a high initial bacterial load, inadequate cooking and inappropriate storage have a negative influence on food safety

and quality (11). Many malpractices take place in food preparation can permit contamination, survival and growth of food-poisoning bacteria (12). Cross-contamination is a very important concept in food safety (11), if raw and cooked foods are prepared on the same surface using the same equipment and by the same food handling persons', or if they are stored in close proximity organisms may spread to foods, which will receive no further heat treatment before consumption (12). The indiscriminate use of insecticides in kitchens also creates hazards, toxic metals and compounds can find their way into food from utensils, food containers or work surfaces (10).

Food handlers may be a major source of food contamination and ultimate sources of health risks either as carriers of pathogens or through poor hygienic practices (13). Workers can carry microbial pathogens on their skin, in their hair, on their hands, and in their digestive systems or respiratory tracts. Unless-workers understand and follow basic food protection principles; they may unintentionally contaminate foods, water supplies and equipment, and there by create the opportunity to transmit food borne illness (14). Food borne disease can also be spread through contact with persons who are ill, by insects, by contaminated hands or equipment (15). A polluted environment, poverty and lack of facilities for the preparation of safe food are interrelated factors which comprises food safety in poor social setting (16). Many infections of human beings are spread through inadequate sanitation (17).

Food borne disease and food and drink establishments

Because of a boom in food service establishments, greater numbers of people are patronizing restaurants, canteens, fast food outlets and street food vendors. While these establishments are an important source of ready to eat at times low cost meals, it remains to be seen whether there is significant health risk associated with them. This Is because unhygienic preparation of food provides ample opportunities for contamination and cross-contamination through harmful micro-organism which are carried on hands, leading to growth or survival of pathogens in food thereby causing food borne diseases(18). Food consumed at retail foodservice establishments, commercial and noncommercial sectors remain an important source for outbreaks of food borne disease. It is estimated that annually food borne illnesses in retail foodservice operations costs consumers $6 billion in healthcare costs and loss of productivity (6).

Food premises for hygienic food production in food establishments

The united states Food and Drug Administration(FDA) Report on the Occurrence of Food borne Illness Risk Factors in Selected Institutional Foodservice, Restaurant, and Retail Food Store Facility Types (2009) identified risk practices and behaviors that contributed to food borne illnesses: improper holding/time and temperature; poor personal hygiene; and contaminated equipment/prevention of contamination (19).

It is well known that perishable foods should be kept at a temperature either below 4^0C or at not less than 60^0C in order to prevent the growth and multiplication of bacteria (20). However, a study conducted in Addis Ababa showed that about 60% of public catering establishments did not have refrigerators; even around 47% of those establishments that had refrigerator could not adjust the temperature properly. In fact one third of the establishments were found with spoiled perishable foodstuff (21).

Food utensils used in the preparation of food can act as a source of contamination. Unclean and/or ineffectively washed and sanitized food utensils are potential risks for food contamination (22). So the sanitary quality of food utensils requires due attention and needs regular monitoring. Socio-demographic condition of owners and food handlers, environmental factors like housing condition, availability of toilet facility, liquid and solid waste management, water supply, and infestation of vectors are some of the factors that affect food safety (23).

One possible source of food contaminations could be dissemination of the pathogens to foods and/or utensils of catering centers through small animals such as cockroaches that live closely with humans in urban environments (24).

Having concrete information on the status of these factors in mass catering establishment is crucial to evaluate the undergoing hygiene education and regulatory activity in the area as well as to design appropriate strategy to improve the sanitary condition so as safeguard the health of the public particularly in our set up where mass catering establishments are flourishing and less attention is given to the sanitary condition.

Sanitary condition of food and drink establishments in Ethiopia

Sanitary conditions of many catering establishments were not satisfactory due to high proportion of insanitary conditions of premise such as poor repair of premises, lower coverage of sanitary facility, unclean preparation and serving room, high proportion of unacceptable waste handling and disposal services, improper washing and handling practice of utensils (25).

The knowledge and practice of Food handlers towards food borne disease, personal hygiene and food handling were found unsatisfactory, the bacteriological swab test of food utensil also revealed gross unhygienic condition of food utensils and/or ineffectiveness of washing and sanitizing procedures, as well as improper handling and/or storage practices (26).

Burden of some important food-borne diseases in Addis Ababa Administrative Region, according the survey conducted in 2003/4 show that in 1995, there were 12568 ascariases, 3167 typhoid, 3106 tapeworm, 16424 tuberculoses, 457 infectious hepatitis cases (3).

Food and drink establishment inspection activities in Kirkos sub City, Addis Ababa

KIRKOS sub City is located at the heart of ADDIS ABABA and is the smallest sub-City with regard to surface area it covered yet a highly populated sub City. It is among the top sub cities with high number of food and drink establishments. Most of the development and infrastructures construction both by government and private sector under go in this sub-City, hence high number of daily laborers, business-man, contractors and other gather around public catering services. Even though there has been a separate regulation/code for hygiene and environmental health (code 1/1986), the Inspection activities by the regulatory body have been carried in more than 3 institutions in the past ten years, namely until 1995 under ADDIS ABABA health bureau, from 1995-2002 under ADDIS ABABA code enforcement service, from 2003-2005 back in ADDIS ABABA health bureau and currently under the newly established ADDIS ABABA food, medicine and health care administration and control authority. More over at the sub City level the current institution is not cascaded and the tasks are operating under the sub City health office temporarily. Due to this factors, high population size, land space scarCity, intensive construction and other unmentioned factors the food and

drink establishment in the sub City are not enough and safe to met the demand and expectation of the consumers; yet unsanitary and unhygienic.

Food borne disease control in food establishments

It is essential that all food supplies to food service establishments should come from sound and reliable sources (10). Food hygiene is aimed to study methods for the production, preparation and presentation of food, which is safe, and of good keeping quality (20). The chief aim is to prevent the contamination of food stuff at all stage of their production that is at collection, preparation or manufacture, transportation, storage and sale or supply (27). The ultimate objective is to prevent food borne disease (23).

Protection of public from food borne hazards involves maintenance of sanitary control over harvesting or slaughtering, processing, preserving, distribution, storage and preparation of food for institutional or home consumption (28). The sanitary control of food – processing and food services industry would be impossible without a law that authorizes sanitary regulation and standards. Individuals have little control over the production and processing of food they consume. The responsibility for food protection lies mainly with food processors, food services personal and the regulatory agencies (29).

The measures to be taken to maintain high standards of catering whether in home or in community at large will include;(i) the control of primary sources of food; (ii) inspection of relevant premises, (iii) supervision of food handlers, (iv) health education, (v) laboratory examination of foodstuffs; and (vi) legislations (23).

2. Description of conceptual framework:

The conceptual framework of this study is prepared based on assumption of immediate, intermediate and proximal determinant factors that can affect sanitary status of food and drink establishments. These factors are majorly classified as:

1. Environmental factors within which the food establishment provides it's service such as:
   - availability of free land space in the establishment compound/nearby, construction/maintenance permission issuance from urban construction office, access to safe water supply and safe Waste handling and disposal from municipal and City administration offices, regulatory activities and action taken by health office inspectors, environmental health law, codes and guidelines..etc.
2. physical housing and ownership condition of establishment building and compound
   - total area and location of establishment, building and institution ownership status, building rented/own, housing premises repair condition, provision of hand wash, latrine, urinals, liquid waste disposal facilities, solid waste storageand handling, wall, ceiling andfloor status of food premise rooms,….etc
3. personal factors
   - socio-demographic information of owners/managers, food handlers recruitment process, training on food hygiene, profession and experience..etc.

the conceptual framework is developed through schematic presentation of interaction between these three major determinant factors and resulting specific indicators of sanitary status of the establishment, showing its effect on sanitary status of food establishment. The framework will be used to design and insure that the general and specific objectives could be addressed with the prepared/suggested data collection tools and methods.

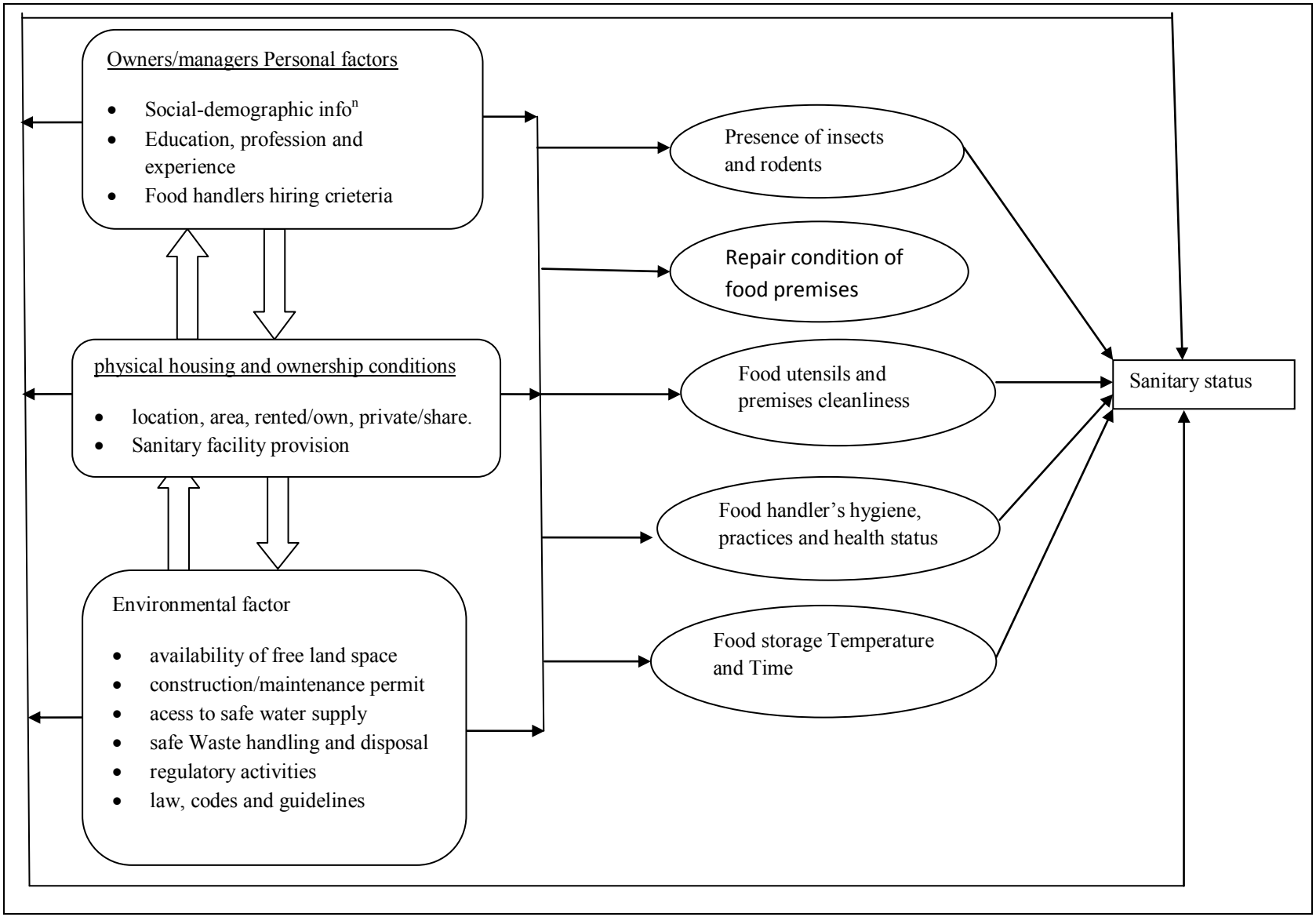

Figure 1 : Conceptual framework of factors that affect sanitary status in mass catering establishments

3. Objective of the study

General objective: - To assess sanitary condition of food and drink establishment and associated factors, in KIRKOS sub City, ADDIS ABABA ETHIOPIA.

Specific objectives: -

1. To describe the magnitude of sanitary status of food and drinking establishment.
2. To assess relevant factors affecting different perspectives of sanitary status of food and drink establishments.

4. Methods

4.1 Study design:-

A cross-sectional descriptive study was conducted from march-April 2014.

4.2 Study area:-

The study area was Kirkos sub City, Addis Ababa Ethiopia. Kirkos sub City is located at the center of Addis Ababa with an area of 14.62 km^2 and population size of 245, 578; is a densely populated , less than 1/ 8^{th} area of Akaki Kality, sub City with an area of 118.08 km^2 less population size of 201,216 (26). According to the ministry of trade business enterprise registration list there are more than 2900 food and drink establishments in Kirkos sub City. Kirkos sub city was selected due to the highest number of establishments were found in this sub city and its location in the center of Addis Ababa, so that it could give better representativeness of other sub cities. Mangers/owners of the establishments were also studied with the assumption of overall safe food handling and food handler's personal hygiene depends on awareness and socio-demographic status of managers/owners.

4.3 Source population:-

All food and drink establishments located in Kirkos sub City are the source populations.

4.4 Study population:-

It is composed of randomly selected food and drink establishments in Kirkos sub City to be the study subjects.

4.5 Inclusion criteria

All types of establishments licensed and registered by Ministry of Trade as classified in sampling procedure section which prepare food and drink, and supply for consumptions or for sale were included in the study (since sample was drawn from a list of license registration provided from Ministry of Trade) .

4.6 Exclusion criteria:-

- International and more than three stars hotels found in Kirkos sub City:- since most of which are located in this sub City, that are in good repair condition with good/clean sanitary status and are staffed with professional food handlers so that they might affect representativeness of the sample and findings of the study ,were excluded from the study,

4.7 Sample size determination:

Sample size for specific objective -1

Sample size for the physical condition of the kitchen in relation to sanitary inspection history of the establishment, Ambo town, West Showa Zone, Oromia Region, March 2007 and Mekele town, Tigray Region, December 2004, is calculated using single population proportion formula: $n = Z_{\alpha/2}^2 \, p(1-p)/d^2$

with the following assumptions on Epi Info version 7.1.06; Power =80%, Confidence interval =95%

Table 1 : Summarized sample size calculation for specific objective 1

.N	Sanitary status in food premises	Proportion of undesirable sanitary status among not inspected	Calculated sample size
1	unclean floor status	52.1	**364**
2	inappropriate waste handling in kitchen	59.2	355
3	unclean kitchen floor	52.4	314
4	unclean kitchen wall and ceiling	55.9	313
5	No open able window in litchen	55.9	311
6	Inadequate ventilation in kitchen	43.3	337

Comparison of the single results from the table above, the maximum calculated sample size (for more validity of the study) is 364, Hence 364 food and drink establishments in kirkos sub City were recruited for overall assessment of physical repair condition and sanitary status of food premises and facilities in establishments.

Sample size for specific objective -2

Sample size for the food hygiene practice in relation to personal factors of food handlers, in Mekele university students cafeteria, Mekele town, Tigray Region, January 2011(n=277) is calculated using single population proportion formula:

$$n = Z_{\alpha/2}^2 \, p(1-p)/d^2$$

with the following assumptions on Epi Info version 7.1.06;Power =80%, Confidence interval =95%

Table 2: Summarized sample size calculation for specific objective 2

R.no	Food handlers personal factors	Proportion of poor food hygiene practice among food handlers	Calculated sample size
1	work experience	45.8	308
2	Overall knowledge on food hygiene	48.8	642
3	Food handler training certificate	34	621

Even though Comparison of the single results from the table above, the maximum calculated sample size (for more validity of the study) is 642, due to limited resource factors the results in rows 2 and 3 from the above table could not be taken for this study and the result in row 1 is less than the number of establishments determined in specific objective 1. Hence one manager/owner from each establishments (with determined sample size above for specific objective 1) were interviewed for assessment of possible socio-demographic, personal and environmental associated factors, so that a total of 364 managers/owners were interviewed.

4.8 Sampling procedure:

1. List of all food and drink establishments of Kirkos sub City data from the ministry of trade was obtained, the number of existing establishments in all WOREDAS was 2909.(census could not be conducted due to large number of food and drink establishments in the sub City, cost and time factors)

2. Due to difference in distribution by types and sanitary status of establishments between each Woredas as reported by sub City Health Office, effort to classify Woredas in to three or four clusters (as poor, medium, good) was impossible. Hence the existing establishments were stratified by Woredas and type of service they provided as hotels, restaurants (with or without bar), cafeterias and snacks, bakery and pastry, butcher shops, fresh fruit and vegetable juice houses.
3. Study participants were determined proportionately from each strata and selection was performed using simple random (lottery method) sampling. The main purpose of stratification and proportionate systematic random selection was to avoid over or under representation of certain types of establishments and reported heterogeneity between woredas.
4. A manager/owner from each randomly selected establishments were interviewed to assess for socio-demographic, personal and environmental associated factors assessment.

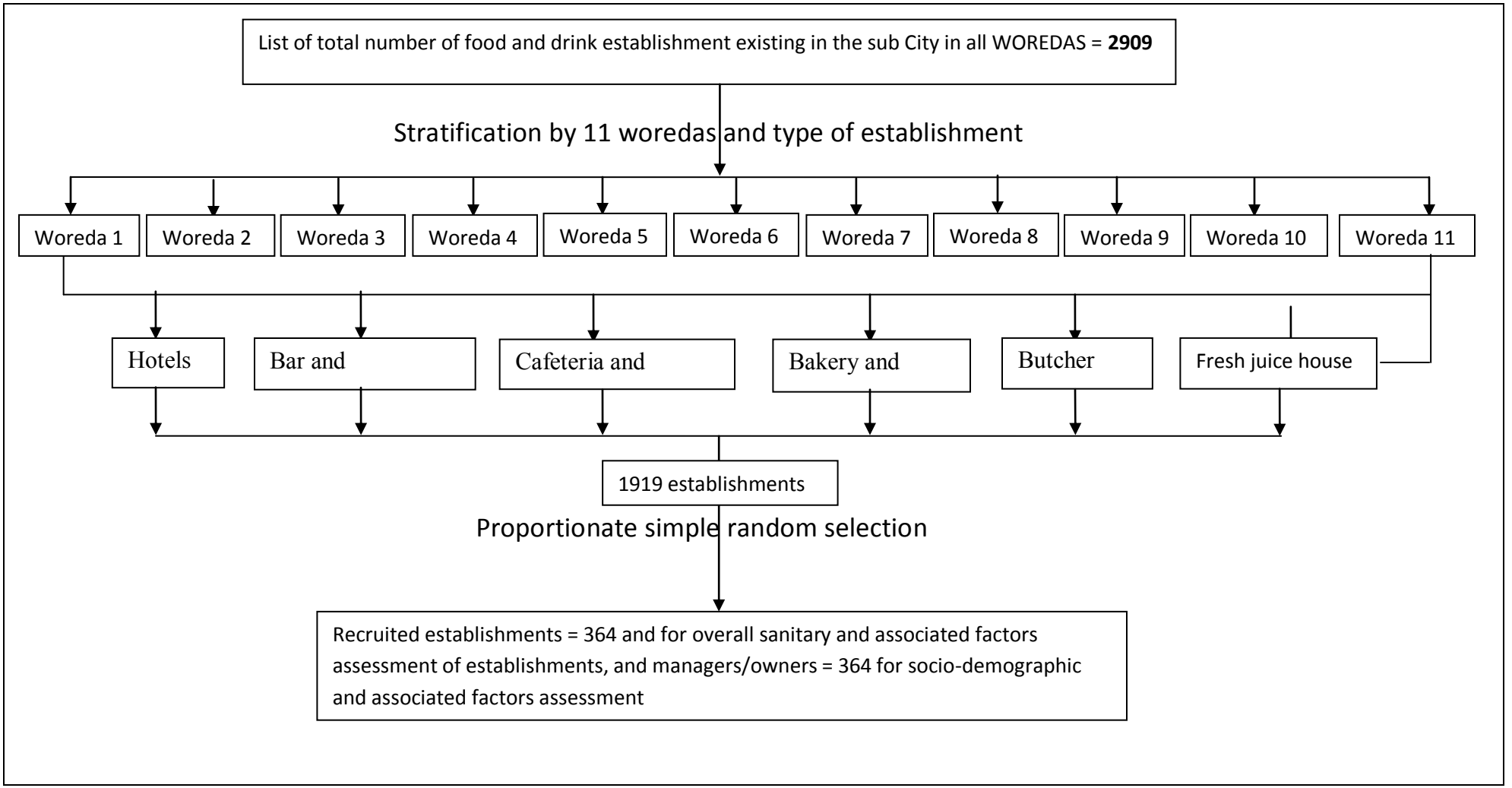

Figure 2: Schematic presentation of sampling procedure

Table 3 : Calculated number of establishments with proportionate sampling by 11 woredas of Kirkos subs City and six type of establishment

Woredas	Total establishment in woredas	Calculated Proportion by woredas	Number and proportion of establishment by type											
			hotels		Cafeteria		restaurant		Butchers		bakery		Fresh juice house	
			numbers	Proportion	Numbers	Proportion	Numbers	Proportion	Numbers	Proportion	numbers	Proportion	numbers	Proportion
1	165	34	14	3	70	14	46	9	3	1	13	3	19	4
2	241	45	12	2	74	14	98	18	9	2	25	5	22	4
3	72	16	4	1	29	6	23	5	2	1	9	2	6	1
4	207	39	22	4	67	13	51	10	7	1	15	3	45	8
5	156	30	6	1	19	4	15	3	5	1	4	1	107	20
6	151	29	12	2	59	11	20	4	6	1	10	2	44	9
7	230	43	13	2	92	17	85	16	8	1	9	2	23	5
8	267	44	37	6	79	13	66	11	9	2	22	4	50	8
9	182	35	10	2	82	16	49	9	4	1	12	2	25	5
10	172	33	5	1	45	9	13	3	5	1	8	1	96	18
11	76	16	9	2	20	4	34	7	5	1	5	1	4	1
Total	1919	364	149	26	636		500		62		132		440	

4.9 Data collection procedure:-

Structured questionnaire

Data was collected using pretested and structured Amharic version questionnaire for face to face interview with establishment manager/owner after ethical clearance from responsible bodies and informed verbal consent from study participants obtained. It was prepared in English and translated to Amharic and later translated back to English, after discussion with team of environmental health inspectors from Addis Ababa City administration food medicine and healthcare administration and control authority (AAFMHACA) and Kirkos sub City branch/office, in order to obtain content validity. Finally the questionnaire was administered in Amharic, for collecting establishment's general and back ground information; socio-demographic and personal data of mangers; and related environmental sanitary facility provision factors.

Observation checklist

Pretested observation checklist was used for overall physical sanitary status observation of the establishment, after ethical clearance from responsible bodies and informed verbal consent from study participants obtained. Observation check list focused on assessing (observing) information on food premises physical condition, repair status and cleanness; utensils cleanliness and washing facilities; food handlers hygiene status; provision of sanitary and lavatory facilities; and waste handling and disposal facilities.

Before the actual data collection the questionnaire and checklist was pretested in 5% (22 establishments and managers/owners) outside the study area; in LIDETA sub City. Based on the pretest necessary modifications were made on the questionnaires and checklists.

The questionnaire and checklist was adapted from different previous researches, reference materials and opinions of AAFMHACA environmental health inspectors with typical and contextual factors of Addis Ababa City in general and the study area specifically.

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A total of 14 sanitarians, 11 for data collection from woreda health office and 3 supervisors from sub City AAFMHACA, were recruited for overall sanitary assessment of the establishment and interview with managers/owners; a letter was written from AAFMHACA

for kirkos sub City FMHACA office and the sub City FMHACA also written a letter to woreda health extension service supervisors(environmental health professionals). Data collectors and supervisors were trained for 1 day and provided with a training manual and name/list of randomly selected establishments. to ensure the quality and validity of data, Regular supervision, spot checking and reviewing the completed questionnaire were carried out by supervisors and the principal investigator on daily basis.

4.10 Dependent variables

- Sanitary status of food and drink establishments.

4.11 Independent variables

- Environmental factors such as availability of free land space in the establishment compound/nearby, construction/maintenance permission issuance from urban construction office, access to safe water supply and safe Waste handling and disposal from municipal and City administration offices, regulatory activities and action taken by health office inspectors, environmental health law, codes and guidelines..etc.
- Socio-demographic and Personal factors of managers/owners such as : socio-demographic information of owners/managers, food handlers recruitment process, training on food hygiene, profession and experience..etc.
- Physical housing and ownership condition of establishments : total area and location of establishment, building and institution ownership status, building rented/owned, housing premises repair condition, provision of hand wash, latrine, urinals, liquid waste disposal facilities, solid waste storageand handling, wall, ceiling andfloor status of food premise rooms,….etc

4.12 Operational definition

Adequate lighting: - is to mean that a healthy person (without major visual problem) can see or easily identify objects in the room comfortably without straining of the eye. (Observation checklist 212)

Adequate ventilation: - is to mean that a room is free of reasonably disagreeable odor and have at least one open-able window. (Observation checklist 212 and 213)

Butcher shop: - is an establishment mainly involved in raw meat sale for take home only.

Bakery/dabo bet: - is an establishment where bread and/or cake are prepared and sold for take home only.

Cleanliness/clean: - shall mean absence of dust particles, grease, finger and other marks , spider webs, smoke particles, refuses, vectors and rodents, domestic animals in kitchen, dining /service room and other premises.

Food and drinking establishment: - establishments where food and drinks are Prepared in large quantities for public consumptions which need to have certificate of competence from AAFMHACA, need to be licensed and registered by trade and industry office. (Addis Ababa health bureau food and drink establishments hygiene and environmental health requirements, 1986 and republished at 2002 Ethiopian calendar)

Food premises is the PHYSICAL FACILITY, its contents, and the contiguous land or property under the control of the PERMIT HOLDER; or The PHYSICAL FACILITY, its contents, and the land property in (food code us phs,2009); raw food, preparation/kitchen, preservation and dining rooms)

Good repair condition: - shall mean absence of big cracks or detached areas, holes and lack of painting for food preparation areas/kitchens, dining room or service room; and being free of breaks (open seams), corrosion, and cracks and easily cleanable for food utensils and equipments. (Observation checklist 201-210 on page 36)

Hotel:-is an establishment providing accommodation and meals for payment.

Health certificate of competence:- a requirement of licensing offices for food and drink establishments, that need to be certified by health inspector/office regarding conformance of establishment observation with required standards, before e issuance or annual renewal business license of food and drink establishments.

Insect infestation : presence of flies, spiders, cockroaches and rats or sign of presence in observed premises of establishments. (Observation checklist 201-210 on page 36

Juice shop: - is an establishment that prepares and serves mainly different type of fresh fruit juices(Observation checklist 201-210 on page 36

Latrine cleanliness: latrine seats and around there are free of litters, soft tissues and papers, feaces and other dirt material. (Observation checklist 201-210 on page 36

Personal hygiene: - refers to those protection measures primarily with the responsibility of the individual, which promote and limit the spread of infectious disease, like hand washing using soap and water, keep body clean etc. (observation checklist 220-225 on page 37)

Properly managed toilet: - shall mean when a toilet/latrine was found free of litters, tissue/anal cleansing paper/water, fly access and other dirty materials like feces or urine around the latrine; where the toilet has a septic tanker that have been emptied with vacuum truck or connected to appropriate municipal sewerage line/system with authorization of ADDIS ABABA City water and sewerage authority. (observation checklist 407-414)

Refuse/garbage properly handled: - appropriate receptacles (fit to cover, moist resistant, durable type and light to left) were placed in proper area (in distant place from food preparation place) for onsite storage of waste. (Observation checklist 422-426)

Restaurant with or without bar:- is an establishment selling ready to eat food, soft and/or alcohol drinks, it may also be involved in raw meat sale for take home or at the spot for consumption as raw or prepared.

Snack bar/Cafeteria/cake bet : - is an establishment rendering foods that can be served quickly and hot, hot drinks like tea, coffee and cakes/sandwiches, as well as non alcoholic drinks, where bread and cake are baked and served to be consumed their or sold for take home.

sanitary status - the state of sanitation (clean or dirty)
condition, status - a state at a particular time; "a condition (or state) of disrepair";
sanitariness - the state of being conducive to health
unsanitariness - a state that is not conducive to health
cleanness - the state of being clean; without dirt or other impurities
dirtiness, uncleanness - the state of being unsanitary
hygiene a condition promoting sanitary practices
(Ref :- encyclopedia dictionary)

Sanitary status of food and drink establishments : - is the condition of overall establishment cleanliness, including building repair condition and cleanliness of food premises, availability and type of sanitary and lavatory facilities, presence of insect infestation and waste handling and disposal

facilities that exists in the establishments, which can affect preparation and serving of food safe to consumers health.(Own adaptation of literal meaning from encyclopedia to this study context; observation checklist)

Wear of appropriate over coat: - the worker worn gown/ over coat and hair cover which is purposely prepared to be worn on normal food handling practice. Cleanliness of the equipment kept: - the equipment is free of dust, filth, grease and finger print.

4.13 Data management

After the completion of data collection, the raw data was edited, entered and cleaned in to a computer using Epi.Info version 3.5.4, then exported to SPSS version 16.0. Data was cleaned in SPSS by running frequencies and cross tabulations. Preliminary frequencies were run to identify missing variables. Data was backed up by saving it in different folders in the computer, removable flash disk and email. Continuous variables were coded and some coded variables recoded.

4.14 Data analysis

Data was analyzed using SPSS version 16.0 and results were displayed using descriptive statistics such as frequency and cumulative frequency distributions, percentages, graphs and tables. Adjusted odds ratio were also calculated for each independent/exposure variables of food premises (preparation room) physical repair condition and cleanliness, insect infestation and waste management in relation to relevant environmental and regulatory activities factors, with 95 % Confidence interval were used to show association with the outcome variables For bivariate analysis as necessary.

4.15 Data quality assurance

Training of the data collection team for one day and pretesting in 5% of the sample size before the actual data collection was conducted to ensure the possible quality of the data. Based on the pre test results, the questionnaire was additionally adjusted quantitatively, contextually and terminologically, and administered on the study population.

To ensure data collectors reached to the randomly selected establishments, name and address information of establishments was provided except tax identity number (TIN); so that data collectors were required to register the TIN (codes) of establishments, which were checked for matching to the establishment list available at hand of supervisors and principal investigators. In establishments where respondents volunteer to participate but refused to give TIN data collectors required to register house number of the establishment building.

Every day the completed questionnaires were handled to the supervisors on each day of data collection. The data collected from food establishments and their owners/managers were checked daily for completeness, clarity and logical consistency by the investigator and supervisor. Incorrectly filled or missed ones were sent back to data collectors for correction. Anything, which is unclear and ambiguous, were corrected on the next day. Five percent of the samples were rechecked by the supervisor whether the interviewers have done their job correctly or not. Randomly selected establishments which were unavailable, not voluntary or without matching codes/types were notified to supervisors and replaced by proposition of the supervisors randomly from list of establishments that were not selected.

4.16 Ethical consideration

The study was approved by Addis Ababa University, school of Public Health ethical clearance committee. Ethical clearance paper from Addis Ababa University, school of Public Health ethical clearance committee and a letter obtained from AAFMHCACA were submitted to the relevant and concerned bodies under ADDIS ABABA City administration offices before starting the study. The information sheet and consent were provided for respondents to read for those who can read and the interviewer had read the consent form for those respondents who can't read. Finally the respondents were asked the agreement to participate in the study. The respondents were informed about the objective of the study. Confidentiality were maintained by omitting their names and personal identification, never used in connection with any information and it was not be revealed to anyone except the principal investigator and assistants and was kept locked with key in the entire study period. Privacy was maintained by arranging quite place for interviewer and study participant to protect them exposing other parties according to the choice of the respondent ensuring visual

and auditory privacy throughout the data collection and the entire study period. Study participants were told the right to participate on the study or not and enabled to withdraw at any time of the study they wish. There was no benefit the study participants can get in terms of money or other item but they have got benefit of health education and technical advice from the data collector for observed poor conditions immediately and in future if there is a change of policy, codes and strategies by considering this study, the benefit was to improve sanitary condition of food and drink establishments and reduce burden of food borne disease provided based on their responses to the questions and observation of establishments status. There was no risk to the study participants because of this study.

4.17 Dissemination of results

Final copy of this study finding was submitted to school of public health, Collage of Health Sciences, Addis Ababa University, ADDIS ABABA City administration Health Bureau, ADDIS ABABA City administration food, medicine and health care administration and control authority, KIRKOS sub City and WOREDAS health office and environmental health sub-process. In addition the finding of the research will be presented on seminar.

5. Results

5.1 Characteristics of study participants

There was no non-responses at all, but some 57(15.7%) of randomly selected establishments, unavailable with the provided address (woreda and house number) and information (TIN number and type of establishments) on the registration list were replaced by other not selected establishments (as explained in data quality assurance section).

Whereas the number of fresh juice houses assessed are lower than the proportions pre-determined in the sampling procedure, because of most the selected fresh juice house establishments were simply raw fruits shops and no preparation done; so that they are replaced with other type of establishments relative to their proportion, as a result The number of hotels, restaurants, cafeterias, butchers and bakeries is higher than the proportions pre-determined in the sampling procedure. The highest number of studied establishments by type is cafeteria 134(36.81%), followed by bar and/or restaurants 104(28.57%), fresh juice house 52(14.28%), hotels 34(9.34%), bakeries 25(6.86%) and butchers 15(4.12%). (Figure 1)

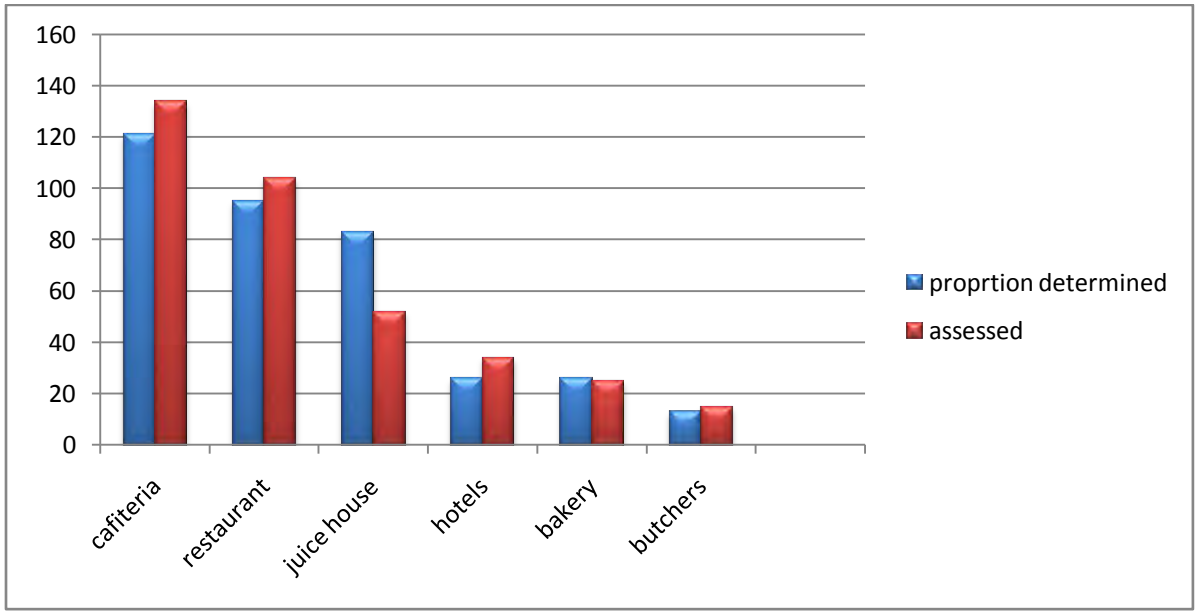

Figure 3 : distribution of number of establishments by type selected in sampling procedure and observed in actual assessment, march-April 2014, Addis Ababa, Ethiopia (n=364).

5.2 Study participants background and related environmental factors

Regarding background information of establishments ; total area of establishment building and compound (if any) in meter squares found out with values of mean 162.78, range of 1590 and smallest value of 10 meter squares; while total service years of establishment 6.46 is the mean years, with a range of 39 and largest value 40 years

Table 1 : 1 Distribution of area of building and compound(if any) by type of establishments, march-April 2014, Addis Ababa, Ethiopia (n=364).

grouped area of building and compound(if any) in meter square	type of establishment						total
	hotels	cafeterias	bar and/or restaurants	butchers	bakeries	fresh juice shop	
10-60 m^2	2	43	17	10	5	43	120
61-100 m^2	3	45	23	3	6	7	87
101-160 m^2	6	30	18	0	10	2	66
161-250 m^2	7	6	23	1	2	0	39
251-1600 m^2	16	10	23	1	2	0	52

Table 1 : 2 : Distribution of environmental and health inspector regulatory factors, march-April 2014, Addis Ababa, Ethiopia (n=364).

Characteristics	frequency	Percent
establishment got health certificate of competence :		
No	129	35.4
Yes	235	64.6
How frequent the establishment inspected per year :		
4-6 times	30	8.2
2 times	151	41.5
only one time	127	34.9
never inspected	56	15.4
Legal and administrative action taken after inspection		
never inspected	56	15.4
Warning	136	37.4
closure/accusation	7	1.9
monetary penalty	7	1.9
one or more of the above	4	1.1
no action taken	154	42.3

Ownership of establishment building :		
Private owned	93	25.5
Private-Rented	152	41.8
Kebele-rented houses	81	22.3
Government rented houses	38	10.4
Which establishment premise/facility repaired in past 2-5 years		
food premises(raw store, preparation or serving room)	141	38.7
sanitary and lavatory facilities	19	5.2
one or more of the above	20	5.5
no construction or repair done	184	50.5
Reason for no construction in establishment premises/facility		
Repaired/constructed	180	49.5
no permission from municipal body/urban plan requirements	38	10.4
no permission from renting body	86	23.6
personal factors	59	16.2
one or more of the above	1	.3

Table 1 : 3: Maintenance status of establishments in relation to building ownership and regulatory activities, march-April 2014, Addis Ababa, Ethiopia (n=364).

Characteristics	Building repaired/constructed		OR(95%CI)
	Repaired (n=180)	Not repaired (n=184)	
establishment got health certificate of competence			
yes	138	97	2.94(1.87,4.26)
no	42	87	1.00
Inspection by health inspector			
Inspected	168	140	4.40(2.23,8.65)
not inspected	12	44	1.00
Legal and administrative actions taken			
Action taken	101	109	0.88(0.58,1.33)
No action taken	79	75	1.00
Ownership of building			
Private owned	60	33	2.22(1.4,3.72)
Rented	120	151	1.00

5.3 Repair condition and cleanliness of Food premises and activities in it

In consideration of handling of raw food materials 229(62.9%) have separate raw store room with 183(50.3%) having a shelf/pallet and only 142(39.0%) of them handling different items of raw food and non-food materials completely separated.

All establishments assessed in this study have a separate preparation room/area with only 266(73.1%) and 226(62.1%) of preparation area has adequate light and ventilation respectively.

In assessing Distance of kitchen from latrine has a mean of 6.3 meters, with median 5 and range of 19 and minimum value of 1 meter.

Table 1 : 4: Observed physical conditions, sanitary status and cleanliness of preparation area/kitchen, march-April 2014, Addis Ababa, Ethiopia (n=364).

Characteristics	Frequency	Percent
Material kitchen floor constructed of :		
Tile/ceramics	85	23.4
Concrete	157	43.1
Plastered stone/soil	88	24.2
Wooden material	9	2.5
plain soil	25	6.9
Material kitchen wall constructed of :		
brick	78	21.4
plastered stone	105	28.8
block	90	24.7
plastered wood and mud	76	20.9
plain wood and mud	15	4.1
Material kitchen ceiling constructed of :		
cheap wood	172	47.3
textile	62	17.0
plastic sheet	49	13.5
no ceiling	81	22.3
kitchen ceiling cleanliness :		
No ceiling	81	22.3
clean	97	26.6
moderate	170	46.7
dirty	16	4.4
Adequate light in kitchen	266	73.1
Adequate kitchen ventilation	226	62.1
Area of open able window with kitchen area :		
less than 10 %	115	31.6
10-15%	122	33.5
greater than 15 %	79	21.7
no open able window	48	13.2
Observed insect infestation in kitchen :		
flies	87	23.9
rats	67	18.4
cockroaches	58	15.9
no insects/rodent	152	41.8
Covered dustbin in kitchen	132	36.3
Source of energy for food preparation :		
electric	295	81.0
kerosene	212	58.2
wood/charcoal	132	36.3

Through summation and recoding of kitchen floor, wall and ceiling cleanliness; overall kitchen cleanliness was categorized as clean, for those with clean floor, wall, ceiling and/or moderate for one of them as clean and otherwise as not clean; as shown in the table bellow association was done with activities in the kitchen.

Table 1 : 5: Cleanliness of kitchen in relation to physical status, dustbin availability, insect infestation, water supply and building ownership and regulatory activities, march-April 2014, Addis Ababa, Ethiopia (n=364).

Characteristics	Overall Kitchen cleanliness		OR(95%CI)
	clean(n=46)	Not clean (n=318)	
kitchen floor status			
in good condition	44	185	15.81(3.76,66.38)
in poor condition	2	133	1.00
kitchen wall status			
in good condition	44	193	14.24(3.39,59.28)
in poor condition	2	125	1.00
kitchen ceiling status :			
in good condition	43	151	15.85 (4.81,52.18)
in poor condition	3	167	1.00
Covered dustbin availability			
Available	22	110	1.73(0.93,3.23)
Not available	24	208	1.00
Pet/domestic animals in kitchen			
Present	5	79	0.36 (0.14 ,0.96)
Not present	41	239	1.00
Water supply type			
Private	43	230	5.48(1.65,18.13)
Shared	3	88	1.00
Overall food handlers status			
Hygienic	23	33	8.63 (4.37,17.06)
Unhygienic	23	285	1.00
Inspection by health inspector			
Inspected	41	267	1.56 (0.59,4.15)
not inspected	5	51	1.00
Ownership of building			
Private owned	20	73	2.58(1.36,4.89)
Rented	26	245	1.00
Adequate light in kitchen			
Yes	43	223	6.10 (1.84,20.16)
No	3	95	1.00
Adequate ventilation in kitchen			
Yes	42	184	7.64(2.67,21.84)
No	4	134	1.00

Table 1 : 6 : Insect infestation in kitchen in relation to dustbin availability in kitchen, cleanliness of kitchen, solid and liquid waste handling and disposal facilities in kitchen, march-April 2014, Addis Ababa, Ethiopia (n=364).

Characteristics	Insect infestation in kitchen		OR(95%CI)
	infested(n=212)	Not infested(n=152)	
Covered dustbin availability in kitchen			
Available	89	43	1.83(1.17,2.86)
Not available	123	109	1.00
Pet/domestic animals in kitchen			
Present	79	5	7.46(6.86,44.42)
Not present	133	147	1.00
Final liquid waste disposal			
To septic tank/pit	82	37	1.96(1.23,3.11)
To open field	130	115	1.00
Insects breading around liquid waste disposal			
Observed	147	46	5.21(3.31,8.19)
Not observed	65	106	1.00
Type of latrine			
no toilet facility	11	5	1.00
Dry pit latrine	80	77	2.11(0.7,6.37)
Flush type	63	31	1.08(0.34,3.38)
VIP	55	38	1.52(0.48,4.72)
others	3	1	0.73(0.60,8.91)
Latrine availability and cleanliness			
Available and Clean	37	55	0.3(0.98,0.95)
Available but not clean	164	92	0.37(0.23,0.61)
No toilet facility available	11	5	1.00
Distance of kitchen from latrine			
1-4 meter	80	43	1.53(0.98,2.40)
>5 meter	132	109	1.00
Type of solid waste storage material			
metal container	26	14	0.53(0.14,1.98)
plastic container	110	77	0.7(0.21,2.25)
Sack/plastic bag	70	55	0.78(0.24,2.57)
no disposal/storage material	6	6	1.00
Solid waste storage material sited			
Proper	116	92	0.75(0.49,1.16)
Improper	90	54	1.26(0.39,4.03)
no disposal/storage material	6	6	1.00

Regarding preservation of ready to eat foods only 109(29.9%) of establishments have a separate preservation room, 320(87.9%) with only establishments having a refrigerator, from which only 75 have a fixed thermometer reading less than 10 ^{0}c and only in 229(62.9%) of the establishments food stuffs was arranged properly. With such preservation facilities and procedures, in 72(19.8%) of the establishments spoilage sign was observed in ready to eat foods.

5.4 Water supply and Sanitary and lavatory facilities.

Observation of water supply system found to be majorly 273(75%) private tap in yard, of which 84(23.1%) of private water there was no running water available at the time of observation. At most times of private water supply interruption Frequency was 3 times a week 149(40.9%) and in 35 (9.6%) of the establishments reported water supply was never interrupted.

Table 1 : 7: Distribution of sanitary and lavatory facilities, march-April 2014, Addis Ababa, Ethiopia (n=364).

Characteristics	Frequency	Percent
Type of dish/glass washing equipment :		
Fixed sink/basin + water tap	207	56.9
Fixed sink/basin but no water tap	68	18.7
Bowls/bucket	72	19.8
One or more of the above	1	.3
no dish/glass wash equipment	16	4.4
dish/glass washing equipment compartment :		
one	83	22.8
two	206	56.6
three	59	16.2
Use of hot water for dish/glass washing	98	26.9
Use of detergent for dish/glass washing	287	78.8
Sanitized utensils kept clean and covered	170	46.7
Ownership of toilet facility :		
Private	260	71.4
Shared	86	23.6
available but not open	2	.5
no toilet facility	16	4.4
type of toilet facility		
Flush type	157	43.1
Dry pit latrine	94	25.8
VIP	93	25.5
Others	4	1.1
How/to where liquid waste finally disposed :		
to Sewerage	108	29.7
to drainage	38	10.4
to river directly	3	.8
desludged by vacuum truck	198	54.4
others	1	.3
Latrine cleanliness	92	25.3
Separate latrine for male and female	102	28.0
Urinal available	146	40.1

Type of hand wash available :		
Fixed sink/basin with running tap	183	50.3
Fixed sink/basin without tap/suspended tanker	86	23.6
Suspended tanker/tap to open field/ground	64	17.6
no hand wash facility	31	8.5
Detergent for hand wash available	219	60.2
Availability of shower facility for food handlers	46	12.6
To where waste from hand wash disposed of :		
Septic tank/pit	245	67.3
Open field	119	32.7
Insects breeding around liquid waste disposal	193	53.0
Type of solid waste storage material available :		
metal container	40	11.0
plastic container	187	51.4
Sack/plastic bag	125	34.3
no disposal/storage material	12	3.3
Metal/plastic solid waste storage material tightly covered	121	33.2
solid waste storage material appropriately sited	208	57.1
How solid waste finally disposed :		
self disposal to municipal container	15	4.1
collected by small scale crews	334	91.8
on site burning /burial/latrine	15	4.1

Table 1 : 8 : Ownership of water supply scheme in relation to kitchen cleanliness, latrine cleanliness and shower facility, march-April 2014, Addis Ababa, Ethiopia (n=364).

Characteristics	Water supply type		OR(95%CI)
	private(n=273)	shared (n=91)	
Kitchen cleanliness			
Clean	43	3	5.48(1.65,18.13)
not clean	230	88	1.00
Latrine cleanliness			
Clean	82	10	24(6.64,91.01)
Not clean	187	69	3.02(1.48,6.16)
no toilet facility	4	12	1.00
Shower (separate)for food handlers			
Available	42	4	3.95(1.37,11.35)
Not available	231	87	1.00

5.6. Socio-demographic status of establishments mangers/owners

From 364 mangers in charge of the observed establishment 193 (53%) are hired persons, 141(38.7%) owners and 30(8.2%) of them were delegates/relatives of owner. most common educational status of 178(48.9%) in grade 9-12; total years of experience of managers found out a mean 5.54, median 4 and range of 31 and minimum value of 1 years experience. (table 9)

Table 1 : 9: Distribution of socio-demographic and personal factors of establishment managers, march-April 2014, Addis Ababa, Ethiopia (n=364).

Characteristics	Frequency	Percent
manager of establishment :		
Owner	141	38.7
Hired person	193	53.0
delegate/Relative/wife/husband	30	8.2
Sex of manager		
Male	238	65.4
Female	126	34.6
Grouped age of manager:		
18-30 years	172	47.3
31-42 years	141	38.7
43-54 ears	40	11
>55 years	11	3.0
Religion of manager :		
Christian	299	82.1
Muslim	63	17.3
Other	2	.5
Where manager live/ stay at night :		
in same establishment	101	27.7
not in establishment	263	72.3
Educational status of manager		
Grade 1-8	89	24.5
Grade 9-12	178	48.9
Above grade 12	87	23.9
Illiterate	10	2.7
Work experience of manager :		
3 years	159	43.7
4-6 years	108	29.7
>7 years	97	26.6
Manager trained :		
by institution	68	18.7
by health office	75	20.6
No training at all	229	62.9

Regarding awareness of mangers about what is required from food handlers during work they mentioned mostly that food handlers shall wear gown 309(84.%) and fewest mentioned renewal of health examination card 53(14.6%). By transforming awareness of mangers response about what is required from a food handler during work hours, those managers mentioned at least 4 of requirements; wearing gown, covering hair, cutting finger nail short, not wearing finger ornament, having health examination card and renewal of it; grouped as good and otherwise as poor, the table shows socio-demographic and personal factors in relation to mangers status.

Table 1 : 10: Mangers awareness about requirement of food handlers in relation to personal factors, march-April 2014, Addis Ababa, Ethiopia (n=364).

Characteristics	Manager awareness		OR(95%CI)
	good(n=167)	Not good (n=197)	
manager of establishment :			
Owner	66	75	1.13(0.51,2.50)
Hired person	86	107	1.24 (0.57,2.68)
delegate/Relative/wife/husband	15	15	1.00
Where manager live/ stay at night :			
in same establishment	41	60	1.34(0.84,2.14)
not in establishment	126	137	1.00
Educational status of manager			
Grade 1-8	27	62	5.35(1.28,22.3)
Grade 9-12	87	91	2.44(0.61,9.74)
Above grade 12	46	41	2(0.5,8.57)
Illiterate	7	3	1.00
Manager trained : by institution			
Trained	38	30	1.64(0.96,2,78)
Not trained	129	167	1.00
Manager trained by health office			
Trained	59	16	6.18(3.38,11.27)
Not trained	108	181	1.00
Manager trained by health office/institution			
Trained	86	49	1.00
No training at all	81	148	0.31(0.2,0.48)
Food handler hygienic status			
Hygienic	41	15	3.94(2.09,7.43)
Unhygienic	12	182	1

6 Discussion

Generally the current study type is similar to that of similar studies conducted in different towns of Ethiopia (mekele, zeway, ambo), but the number of total establishments existing in the current study area, the sampling procedure and focus of study differs relatively; for instance licensure of establishments is not an issue in this study, since study participants were selected from a license registration list(system) available from ministry of trade.

More than one third 274(74.5%) of the establishments were doing their business in rented houses, higher than studies of ambo 104(59.4%) (25), median establishment years of service was 6.46 with some 43,808 consumers/customers daily much higher than Mekele median service of 2 and 13,578 consumers/customers per day (26), which could be a clear indication of scarcity of available buildings/land space and prolonged high demand of catering services in the current study area.

Regarding routine sanitary inspection regulatory studies the current study revealed that only 15.6% of observed establishments were not inspected, much less than results of studies of 28.4%(25) ambo and 36.4%. Mekele(26).

Despite there were no studies conducted regarding maintenances/construction of establishment building, premises and facilities, this study revealed that construction / repair in past 2-5 years done in only 180(49%) of the establishments with relation among establishments who has got health certificate of competence and routinely inspected, OR= 2.94(1.87,4.26) and 4.40(2.23,8.65)95%CI, respectively. Even though routine inspection activities varies considerably by woreda, type of establishments, frequency and overall coverage, the activity was related to better physical status of establishments.

In addition the recently health certificate of competence requirement (Starting from 2004 budget year beginning, a legislation jointly prepared by ministry of trade and EFMHCACA stating "license issuance and renewal of food and drink establishments shall be allowed by responsible health office") has improved physical condition of establishments, yet it also lacks coverage in all establishments and uniform enforcement with the existing standards. Moreover, establishments repaired/constructed were more related in privately owned buildings than in rented, with OR=2.228 (1.4,3.7295%CI), a demonstrating evidence of good repair condition in

association with building ownership status and which could be due to ease of access for construction or maintenance permission in privately owned building establishments than establishments in rented building.

Among those establishments which were not repaired, 124(67.4%) reason for construction were due to urban plan requirements and no permission from renting body are external factors beyond managers/owners capacity or willingness, which require integration and memorandum of understanding between license issuing, urban planning, repair/construction permitting administrative offices and health inspectors.

Even though the focus of current study was mainly on the sanitary status of the establishment rather than food handlers and/or managers, the study assessed an overview of establishment's manager socio demographic and personal factors assumed to affect activities, food premises status and availability of necessary facilities and food handlers hygiene status.

Among 364 managers interviewed in this study, Socio-demographic characteristics of mangers found out to be a younger median age of 32 years, less Christians 82.1%, more Muslim 17.3%, and fewer illiterate 2.7% than a study in Mekele with median age 35years, 97.1% Christians and Muslim 2.5%(26). Among 364 mangers, 193 (53%) were hired persons very different from study in ambo 11(6.3%)(25) and 19(4.5%) Mekele(26), which might be due to a better availability of skilled or experienced manpower and observed presence of establishments with more than one branch/ type. In accordance with mentioning of managers about requirement of food handlers practice of safe food handling and personal hygiene keeping, managers were rated as good and not good.

Managers with good awareness were better related to hired persons with OR= 1.24 (0.57,2.68) 95% CI and those managers living/staying night in the same establishment OR= 1.34(0.84,2.14)95% CI, which could be due to a better close follow up of establishments food handling activities and food handlers monitoring. Sanitary status of establishments were obviously dependent on educational background and relevant safe food handling training of managers. This study also proofs strong association of managers good status with training by health office OR=6.18(3.38,11.27) 95% CI than by private institution OR= 95% CI which could be due to focus and purpose of training's by each institutions. Similarly the study revealed

managers who have got no training by any institutions were adversely associated to good managing status with OR=0.31(0.2,0.48) 95%CI.

According to the current study results, food handlers under mangers with good status of awareness were strongly associated with observed hygienic status of food handlers OR=3.94 (2.09,7.43) 95%CI, which shows leadership role of managers with regard to personal hygiene of food handlers.

Since safe food handling and serving in catering establishments starts right from raw food handling and storage facilities a due attention shall be given to assure so. Though there were more separate store rooms available 135(37.1%) in this study than 50(28.6%) study of ambo(25) The establishments assessed in the current area were found out with poor raw food storage practice of only 50.3 % of them having shelf/pallet for putting items and 39% of them organized consumable and non consumable stuffs separately.

Despite Addis Ababa is a capital City of Ethiopia and physical repair condition of kitchen/preparation area of establishments expected to be better than other towns, the reverse was observed in assessed establishments. The current study revealed that considerable number of kitchen floors 25(6%) constructed of with plain soil, even though less than findings of studies in Mekele 28(6.9%) plain soil kitchen floors(26) and ambo 66(53.7%) plain soil kitchen floors(25). more than $1/5^{th}$ unacceptable proportion of kitchen without ceiling were observed. with good repair condition of floor 229(62.9%) much better than result of ambo 59(47.9%)(25) where as Clean kitchen floor, wall and ceiling were 105(28.8%), 120(33%) and 97(26.6%) respectively; resulting in rating of overall kitchen cleanliness 46(6%) as clean and 318(94%) as not clean, still better than the above studies tough measurements used differ reasonably, thus material floor, wall and ceiling constructed of can affect observed repair conditions of each, which could also affect possibility of easily cleaning and overall kitchen cleanliness.

In addition ownership of building as discussed above was observed to affect or limit repair/construction done to the establishment, also contributed for better clean kitchen with OR=2.58(1.36,4.8995 % CI), yet can affect premises repair status; accordingly clean overall kitchen cleanliness was highly associated with good repair condition of floor, wall and ceiling

with OR=15.81(3.76,66.38 95 % CI), OR=14.24(3.39,59.28 95 % CI) and OR=15.85 (4.81,52.18 95 % CI) respectively, indicating good repair surfaces can easily be cleaned and kept neat.

Observed proportion of kitchen ventilation 62.1% and lighting 73.1% were still lower than the study in Mekele 69% and 77.4% respectively(26); which were also considerably related to clean kitchen with OR=6.10 (1.84,20.16) 95 % CI for adequate light and OR=1.73(0.93,3.23 95 % CI) for adequate ventilation in kitchen, which could be due to availability of open able window in more than 55% of the establishments but still less than results of Mekele(26). Kitchen cleanliness was also strongly associated to hygienic food handlers status with OR=8.63 (4.37,17.06 95 % CI), which shows additional personal factors affecting establishments sanitary status.

Kitchens provided with covered dustbin were better related to clean overall kitchen cleanliness OR=1.73(0.93,3.23 95 % CI) also related to infestation in kitchen with OR=1.83(1.17,2.86 95 % CI), which indicates onsite proper storage and handling of waste immediately after generation can affect both kitchen cleanliness and rodent nuisance.

Results of this study revealed that, generally availability of sanitary and lavatory facilities were better, specifically pour flush latrines 157(43.1%), three compartments dish washing 59(16.2%) and proper (to septic tank) final disposal of liquid waste245 (67.3%) than results of a study in Ziway with pour flush latrines 21(14.3%), three compartments dish washing 29(19.8%) and proper (to septic tank) final disposal of liquid waste39 (26.5%)(30).

It is well known that drawback of dry pit latrines is it can serve as breading site for insects and of course it is found that infestation is related to more of to dry pit latrines with OR=2.88(0.29,28.36 95 % CI) than weaker relation to pour flush and VIP latrines with OR=1.36(0.11,16.5795 % CI) and OR=1.47(0.14,14.7 95 % CI) respectively. The observed association of pour flush and VIP latrine with infestation could be due to latrine cleanliness and distance from kitchen, which were also related to infestation with OR=0.3(0.98,0.9595 % CI) protectively for clean latrines and OR=1.53(0.98,2.40 95 % CI) for kitchens in less than 5 meter distance from latrine. Despite type of latrine, its cleanliness and distance from kitchen observe insects breading around final of liquid waste disposal facility (septic tank, pit or open field) was strongly associated with insect infestation in kitchen. Thus observed insect infestation in kitchen can be caused as a function of interrelated and interdependent series of factors.

Even though Availability of refrigerator (87%) found out to be higher than observed in studies of Mekele(26) and ambo(26) with 32.7% and 66.7%, among the 364 establishments sign of spoilage observed in ready to eat foods was also high 72(19.2%), which could be due to only 75 (20.6%) of the establishments refrigerators have a fixed thermometer reading less than 10 ^{o}c and only 229(62.9) of establishments had arranged food stuff properly in refrigerator.

Though majority of the establishments 75% had access to private pipe water, it's distribution is inconsistent with pipeline coverage of 96 % as reported by the Addis Ababa City administration water and sewerage authority; more tragedy factor was water supply termination frequency in 149 (40.9%) was reported as at list 3 times a week. Access to private pipe water supply was strongly related to clean kitchen, latrine and availability of shower facilities with OR=5.48(1.65,18.1395% CI) , OR=24(6.64,91.01 95%CI) , OR=3.95(1.37,11.3595 % CI) respectively. Thus water supply was found out to be a cross-cutting issue for attainment of establishment's good sanitary status and it would have more significance than these if there was no interruption at all or longer frequency of interruption.

7. Strength of the study

1. Representativeness of the study participants was very good, since simple random sampling was used; all establishments were having equal chance of being selected for the study.
2. All woredas in Kirkos sub City were included and selection was determined with proportional size to total number of existing establishments by type and woreda.

8. Limitation of the study

1. 57 of selected Study participants randomly selected(predetermined) were unavailable and replaced by other establishments, hence proportionate sampling was not maintained as determined in sampling procedure.(due to list obtained from ministry of trade used as a sampling frame for the study had some non matching data and information of the study participants)
2. Since only few similar studies were conducted in this topic are, comparison of findings should be seen cautiously in light of subjective measurement of variables and study participant characteristics and methodological differences with other studies.

9. Conclusion

With the findings of this study generally it could be concluded that overall sanitary status of establishments was found to be in poor status with majority of the establishments; and particularly;

- Physical Repair condition of establishments was hampered by building ownership, availability of land space and urban plan requirement.
- Awareness status of mangers about safe food handling, food handlers hygiene keeping and overall establishment safe food handling & serving activities found to be lower.
- With only physical observation of food handlers hygiene status was unacceptabe with majority of food handlers were not having periodic health examination.
- Food premise activities were done in rooms with majority of them with poor physical condition, repair status, not clean, infested with insects/rodents, pets present and in few meter distance from latrine, improper raw food storage and ready to eat foods preservation and unconventional dish/cup washing facilities.
- Low or poor availability of safe human liquid and solid waste disposal facilities with most of them sited and managed inappropriately.
- Inconsistent water supply distribution and unarguably very frequent interruption of water supply sources.

10. Recommendation

Towards improvement of food and drink establishments for the observed poor sanitary status in results, principal investigator of this study highly recommends the responsible regulatory body (AAFMHACA) and the offices under it the following activities bellow:

1. Legal, administrative and direction wise enabling environment shall be created/reconsidered to overcome external factors affecting repair/construction activities of establishment's physical housing/building.
2. Memorandum of understanding between different concerned stake holders and joint planning, monitoring and evaluation of activities in food and drink establishments.
3. Mechanism of argument between renting bodies of building houses (private, kebele and governments house renters) and owners about maintenance procedures and costs sharing shall be devised.
4. Training of managers shall be the priority promotion and advocacy activity prior to food handlers training and regulatory activities. Private institution training shall widely incorporate hygienic food handling and practices in their curriculum. An integrated and uniform system of food handler's recruitment and registration shall be dealt and put in to action.
5. safe food handling practice requires an integrated approach which can address related factors: both inside, around and outside the kitchen, food handlers hygiene, proper handling, storage and disposal of liquid and solid waste and facilities necessary for achieving so.
6. Serving of safe food in catering places needs a comprehensive approach oriented in a way that all activities and premises has an equal and determinant importance, which shall be addressed without ranking or prioritization of them.
7. The minimum standard prepared for food and drink establishments shall be edited and modified in consideration of peculiar issues/focus with different types of establishments.
8. More importantly a standard for: total area and land space, area of building and specific premises, distance and location between premises should be prepared and put in to action.
9. Inspection activities frequency and period shall be planed, scheduled and conducted with in all existing establishments in catchment area and focused towards assessing overall sanitary status and addressing possible related/affecting factors as found out in this study.
10. Repeatedly committed/observed unacceptable sanitary and hygiene status, poor premises repair condition and cleanliness, sanitary and lavatory facilities unavailability/functionality, improper waste handling and disposal activities; shall be corrected with necessary legal and administrative actions continually and equally.

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Annex 1: Participant's Information Sheet

Title of the project: sanitary Assessment of food and drink establishments in kirkos sub City Addis Ababa, Ethiopia.

Principal Investigator: KASSA BULCHA

Advisor: Dr. ABERA KUMIE

Coordinating office: Addis Ababa University School of Public Health

Name of the sponsor: addis ababa food medicine and healthcare administration and contro authority

Purpose: To assess sanitary condition of food and drink establishment and associated factors, in KIRKOS sub City, ADDIS ABABA ETHIOPIA. This research undertaking is a postgraduate Masters of Public Health partial fulfillment research thesis.

Procedure and Participation: The method of the research is a cross sectional study. The expected duration of the participant's contact with the interviewer will be not more than thirty minutes. You asked to participate in this research because the trustful information which you will provide is important for the understanding of the proposed subject matter. Moreover, your particular participation is affirmed by the sampling frame through the procedure of probability sampling technique which provides equal chance of selection. You will be asked about your socio-demographic, environmental and sanitary facility provision factors, physical sanitary status of establishments, on status of repair and cleanness of premise, provision of sanitary facilities, waste handling and disposal.

Confidentiality: to establish secured safeguards of the confidentiality of research data, the Principal investigator I will use codes during data collection period instead of using names. The original data will be locked in cabinets until the data analysis carryout and no person shall access except the Principal Investigator and the advisor for data checking and cleaning purpose. The use of information for any purpose other than that to which participants consented is unethical to the participants. The information you provide is not disclosed in the way it identified your personal characteristics and privacy. After the research defense and final work is approved by the school of public health and academic commission and university senate, the original data questionnaire will be incinerated in secure manner.

Benefit: The research does not have a short term financial, health care and capaCity building benefit to the research participant as an individual or as a group but in the long run it will help the concerned organization and policy makers to have a policy consideration and direction and formulation of strategy and design of occupational health programs based on the

recommendations and the findings. Moreover the research work will help as a base line data in the field.

Risk: The proposed research does not have any inhuman treatment of research participants and any physical harm, social discrimination, psychological trauma and economic loss.

Inducement, incentive and Compensation: This study process has no any form of inducement, coercion and the study does not bring any risks that incur compensation.

Results Dissemination: The researcher is responsible for dissemination of findings moreover fully accountable to provide feedback to the food establishment owners/managers and Addis Ababa City administration offices. Maximum effort will be done to publish the finding in scientific reputable journal.

Freedom to withdraw: If you want to participate in the study, you have full right to with draw from the study any time you wish. This would have no effect at all on your establishment business conduct or other administrative action that will be taken by regulatory bodies as routine moreover nobody will enforce you to explain the reason of withdrawal.

Person to Contact: The participant has the right to ask information that is not clear about the research context and content before and or during the research work. You can contact the principal investigator and her advisor. Moreover this research undergone ethical reviewed and approved by Addis Ababa University College of Health Sciences IRB. The main task of this board is to make sure that the ethical principles is adhered or not and the research participants are protected from harm. If you want more information and check about this project you can contact the following:

Addis Ababa University College of Health Sciences IRB Secretary Office Tel. 0115157701

Principal Investigator: KASSA BULCHA Tel: 0911019128 (Mobile)

Advisor: Dr. ABERA KUMIE, School of Public Health, College of Health Science, Addis Ababa University; Mobile: 0911882912; Office: 011-5157701

Annex 2: Informed consent form

Title of the project: assessment of sanitary status of food and drink establishment in ADDIS ABABA City; as a case study of KIRKOS sub City

To assess sanitary condition of food and drink establishment and associated factors, in KIRKOS sub City, ADDIS ABABA ETHIOPIA. I have been well aware of that this research undertaking is a post graduate degree partial fulfillment of research thesis which is fully supported and coordinated by AAU School of Public Health and the designate principal investigator is kassa bulcha. I have been fully informed in the language I understand about the research project

objectives that are to To assess sanitary condition of food and drink establishment and associated factors, in KIRKOS sub City, ADDIS ABABA ETHIOPIA.

I have been informed that all the information I shall provide to the interviewer will be kept confidential. I understood that the research has no any risk and no compensation. I also knew that I have the right to withhold information, skip questions to answer or to withdraw from the study any time I have acquainted nobody will impose me to explain the reason of withdrawal. It is also enlighten there would have no effect at all in my health benefit or other administrative effect that I get from the cement factory. I have assured that the right to ask information that is not clear about the research before and or during the research work and to contact

Addis Ababa University College of Health Sciences IRB Secretary Office Tel. 0115157701

Principal Investigator KASSA BULCHA Tel: 0911019128 (Mobile)

Advisor: Dr. ABERA KUMIE, School of Public Health, Addis Ababa University Mobile: 0911882912;

Office: 011-5157701

I have read this form, or it has been read to me in the language I comprehend and understood the Condition stated above, therefore, I am willing and confirm my participation by signing the consent.

Name of the participant _____

Agreed to participate in the study: Yes /No (mark one of them for verbal consent)

Signature _____ (if written consent)

Name of witness signature _____ (Data collector, supervisor, any third person)

Signature _____

Date _____

Annex 3: የተሳታፊዎች የመረጃ ቅጽ

አዲስ አበባ ዩኒቨርሲቲ፣ጤና ሳይንስ ኮሌጅ ፣የሕብረተሰብ ጤና ትምህርት ክፍል ይህ መጠይቅ በአዲስ አበባ ከተማ ቂርቆስ ክፍለ ከተማ ውስጥ በሚገኙ የምግብና መጠጥ ድርጅቶች አጠቃላይ የንጽህና ሁኔታ ጋር በተያያዘ ለሚደረግ ጥናት የተዘጋጀ መጠይቅ ነው።

የተሳታፊዎች የመረጃ ቅጽ

የፕሮጀክቱ ርዕስ፡ የምግብና መጠጥ ድርጅቶች አጠቃላይ የንጽህና ሁኔታ ዳሰሳ

ጥናቱን የሚያካሂደው ግለሰብ፡ ካሳ ቡልቻ

አማካሪ፡ ዶ/ር አበራ ቁሜ

ማስተባበሪያ ቢሮ፡ በአዲስ አበባ ዩኒቨርሲቲ የህብረተሰብ ጤና አጠባበቅ ት/ቤት

ዓላማ፡ የምግብና መጠጥ ድርጅቶችን አጠቃላይ የንጽህና ሁኔታና ተያያዥ ጉዳዮችን በማጥናት ለድህረ-ምረቃ ትምህርት ማሟያነት ለመጠቀም ነው።

አካሄድና ተሳትፎ፡ ከዚህ በ መቀጠል ከምግብና መጠጥ ድርጅትዎ አጠቃላይ የንጽህና ሁኔታ ጋር በተያያዘ ጥያቄዎችን ላቀርብሎት እወዳለሁ። ከእርሶ የሚገኘው መልስ በሀገራችን ለሚገኙ የምግብና መጠጥ ድርጅቶቸ ንጽህናው የተሟላ አገልግሎት አቅርቦት ለማሻሻል ከፍተኛ እገዛ ይኖረዋል።ይረዳል::ጥናቱ ውጤታማ ሊሆን የሚችለው እርስዎ በሚሰጡት ትክክለኛ መልስ በመሆኑ ጥያቄዎቹን በጥንቃቄ እንዲመልሱልኝ ፍቃደኛነትዎን በትህትና እጠይቃለሁ::

ሚስጥራዊነት፡ ከእርስዎ የምናገኛቸውን ማንኛውንም መልሶች በሚስጥር እንጠብቃለን። ከዚህ ጥናት ጋር በተያያዘ በማናቸውም ቦታና ጊዜ ስምዎ እንዳይፃፍና እንደማይጠቀስ ልንገልጽለዎ እንወዳለን።

ጥቅም፡ ይህ ጥናት የአጭር ጊዜ የገንዘብ፣ የጤና እንክብካቤ እና የአቅም ግንባታ ጥቅማ ጥቅሞች ለተሳታፊዎች የሉትም። ነገር ግን በሂደት የጥናቱ ውጤት ለሚመለከተው ኣካልና ፖሊሲ አውጪዎች ለፖሊሲ ግብአትነት፣ አቅጣጫ እና ስትራቴጂ ቀረፃ ይረዳል። በይበልጥ ጥናቱ በመስኩ እንደ መነሻ መረጃ ሆኖ ያገለግላል።

ጉዳት፡ ሊካሄድ የታሰበው ጥናት በተሳታፊዎች ላይ ኢሰብአዊ የሆነ አቀራረብ፣ አካላዊ ጉዳት፣ ማህበራዊ አድሎ፣ ስነልቦናዊ ጉዳትና የኢኮኖሚ ድቀትን አያስከትልም።

ጉቦ፣ ማበረታቻ እና ካሣ፡ ይህ ጥናት ምንም አይነት ማበረታቻና ካሣ የለውም። በተጨማሪም ምንም አይነት ካሣ የሚያስከፍል ጉዳት አያመጣም።

የውጤት ስርጭት፡ አጥኚው የጥናቱን ውጤት ሙሉ በሙሉ ለተመሳሳይ የምግብና መጠጥድርጅቶች የማሳወቅና እና ፖሊሲ አውጪዎች የመስጠት ኃላፊነት አለበት። በተጨማሪም ታማኝ የሆኑ ሳይንሳዊ ጆርናሎች ላይ ለማሳተም ከፍተኛ ጥረት ያደርጋል።

የማቋረጥ ነፃነት፡ በጥናቱ ለመሳተፍ ፍቃደኛ ሆነው ከጀመሩ በኋላ በማናቸውም ሰዓት ጥናቱን ሊያቋርጡ ይችላሉ። ለዚህም ማንም ሰው ያቋረጡበትን ምክንያት እንዲያብራሩ ሊያስገድድዎ አይችለም።

መገናኘት የሚችሉት ሰው አድራሻ፡ የጥናቱ ተሳታፊ ስለጥናቱ ሁኔታ እና ይዘት ግልጽ ካልሆነለት በማናቸውም ሰዓት መረጃ የመጠየቅ መብት አለው። ዋና አጥኚዋን እና አማካሪዋን ማግኘት ይችላሉ። ለበለጠ መረጃ እና ስለፕሮጀክቱ ማረጋገጥ የሚፈልጉት ነገር ካለ በሚከተለው አድራሻ መጠቀም ይችላሉ።

ዋና አጥኚ፡ ካሳ ቡልቻ ስልክ፡ 0911019128

አማካሪ፡ ዶ/ር አበራ ቁሜ አዲስ አበባ ዩኒቨርሲቲ ጤና ሳይንስ ኮሌጅ የህብረተሰብ ጤና ት/ቤት ሞባይል፡ 0911882912፣ የቢሮ 011-5157701

Annex 4 የፍቃደኝነት መጠየቂያ ፎርም

የፕሮጀክቱ ርዕስ፡ የምግብና መጠጥ ድርጅቶች አጠቃላይ የንጽህና ሁኔታ ዳሰሳ

ይህ ጥናት በአዲስ አበባ ዩኒቨርሲቲ የህብረተሰብ ጤና አጠባበቅ ት/ቤት አስተባባሪነትና ድጋፍ በተማሪ ካሳ ቡልቻ ለድህረ-ምረቃ ፕሮግራን ማሟያነት እንደሚካሄድ አውቃለሁ። በሚገባኝና በማውቀው ቋንቋ ስለፕሮጀክቱ ዓላማ በአግባቡ ተገልፆልኛል።

ዋና አጥኚ፡ ካሳ ቡልቻ ስልክ፡ 0911019128

አማካሪ፡ ዶ/ር አበራ ቁሜ አዲስ አበባ ዩኒቨርሲቲ ጤና ሳይንስ ኮሌጅ የህብረተሰብ ጤና ት/ቤት ሞባይል፡ 0911882912፣ የቢሮ 011-5157701

እኔ ለጠያቂው የምሰጣቸው መረጃዎች ሚስጥራዊነት እንደሚጠበቅ፣ በማናቸውም ሰዓት ቃለ መጠይቁን ማቋረጥ፣ ጥያቄዎችን መዝለል እንደምችል እና ጥናቱም ምንም ዓይነት ጉዳት እንደማያስከትል፣ ጥቅማ ጥቅምም ሆነ ካሣ እንደሌለው ተረድቻለሁ። በተጨማሪም በማናቸውም ሰዓት በጥናቱ ዙሪያ ግልጽ ያልሆኑልኝ ነገሮችን የመጠየቅ ሙሉ መብቱ እንዳለኝ ተረጋግጦልኛል።

ይህ የፍቃደኝነት መጠየቂያ ቅጽ ከላይ በውስጡ ስለያዛቸው ጉዳዮች በማውቀው/በምረዳው ቋንቋ አንብቤ/ተነቦልኝ በጥናቱ ለመሳተፍ ፍቃደኝነቴን በቅጹ ላይ በመፈረም ተስማምቼያለሁ።

የተሳታፊው ስም ----------

በጥናቱ ለመሳተፍ ተስማምቼያለሁ፡ አዎ/አይ (በቃል ለመስማማት በመረጡት ላይ ምልክት ያድርጉ)

ፊርማ ----------(የጽሁፍ ፍቃደኝነት መግለጫ ከሆነ)

የእማኝ ሥም ---------- (መረጃ ሰብሳቢ፣ ተቆጣጣሪ፣ ወይም ማንኛውም ሦስተኛ ሰው)

ፊርማ ----------

ቀን ----------

Annex 5 English version questionnaires to interview owners/managers of food establishments and checklist for socio-demographic information, environmental and associated factors assessment.

General instruction

Almost all questions have pre-coded response. So it is important to follow the following instructions while you are interviewing respondents and recording their answer.

- Ask each question exactly as it is written on the questionnaire.
- Do not read the pre-coded response to respondents. Listen only the response of respondent.
- Circle the response in the response column that best matches the answer of the respondent.
- Do not rely on the response of respondents only; inspect/observe the areas that need physical observation

1. Socio demographic information, environmental and associated factors with managers/owners of establishments			
S.N	**Questions**	**Responses**	**codes**
101	Manager of the establishment	1.Owner 3. Hired person 4.delegate/Relative 4. Other, _____	/___/
102	Does the establishment have license?	1.Yes 2.No	/___/
103	Establishment ownership	1.Individual 2. Organization 3. Association 4. Other, _____	/___/
104	Service year of establishments in years	_____Year	/___/
105	Sex of manager	1. Male 2. Female	/___/
106	Age: _____years	_____Years	/___/
107	Religion of owner/manager	1. Christian 2. Muslim 3. Other, specify	/___/
108	Marital status owner/manager	1. Single 2. Married 3. Divorced 4. Widowed 5.Separated	/___/
109	Where do you live/stay?	1.in same establishment 2.not in establishment	/___/
110	Educational status owner/manager	1. Illiterate 2.Grade 1-6 3. Grade 7-12 4. Above grade 12	/___/
111	Profession of owner/manager?	Specify, _____	/___/
112	Did you worked as a food handler?	1. Yes 2. No	/___/
113	If yes as what food handler and for how long?	As_____and for_____years	/___/
114	Did you have any training on food-hygiene in past 2 years?	1. Yes 2. No	/___/
115	If yes, from where/by whom?	1.institutions 2.health office 3.others,_____	/___/
116	If by health office, Did you applied/implemented what u learnt?	1. Yes 2. No (if yes proceed to 117, if no proceed to118)	/___/
117	If yes, what changes it brought to you or your establishment ?	Specify, _____	/___/
118	If no, what are difficulties to do so? (to apply?)	Specify, _____	/___/
119	How do you hire a food handler?	1.from brokers 2.vacancy announcement 3.others, _____	/___/
120	Your requirement for hiring a food handler?	1.institution certificate 2.experience 3.others,_____	/___/

121	If by experience, minimum years required?	_____years.	/___/
122	Ownership of the establishment building?	1. Private owned 2. Private-Rented 3. Kebele-rented 4.Government rented houses administration enterprise-rented	/___/
123	Type of energy used for food preparation?	1.electric 2.wood 3.kerosene fuel 4.others,_____	/___/
124	Average number of consumers/day?	_____ Persons	/___/
125	Total area of building andcompound (if any)?	building_____M^2 and compound_____M^2	/___/
126	does any construction/repair to the establishment/building in past 5 years done?	1.Yes 2. No (if yes proceed to 125, if no proceed to117)	/___/
127	What facility/premises constructed or repaired?	specify,_____ _____	/___/
128	Who ordered the construction/maintenance?	1. Health inspectors 2. Self 3.others, _____ __	/___/
129	If by health inspectors, What was the reason for construction?	1. License issuance 2.licence renewal 3. Inspection feedback 4. others specify,_____ _____	/___/
130	What was reason for **no** repair/construction?	1.const^n permission not gained 2.urban plan requirements 3.others specify, _____ _____	/___/
131	Who cancelled permission?	1.Municipal body 2.renting body 3.others specify,_____	/___/
132	How frequent did your establishment has been inspected by health inspectors per year?	1.6 times 2. 4 times 3. 2 times 4. Only 1 time 5. Not at all	/___/
133	What major changes did the inspection resulted?	_____	/___/
134	Administrative action taken after inspection?	1.Warning 2.closure/accused 3.monetary penalty 4.others,__ _____	/___/
135	Whom other regulatory bodies inspected the establishment and with what regard?	by whom_____ regarding_____	/___/
136	Did you think inspection is important?	1.Yes 2. No (Any reason If yes/no, _____ _____)	/___/
137	Did establishment got certificate of competence from health office?	1.Yes 2. No	/___/
138	How do you rate your establishment cleanliness?	1.very good 2.good 3.fair/medium 4. poor 5.very poor	/___/
139	Your justification for rating so?	Specify, _____	/___/
140	What support do you need or what needs to be corrected for better rating of your establishment?	Specify, _____	/___/

Annex 6 English version checklists for observing physical sanitary status of food premises, sanitary facilities and provisions conditions.

S.N	2. Physical sanitary condition of food premise rooms							
	Question	Responses	Response Codes in food kitchen					
			Raw food store	Preparation kitchen	Serving dinning	Stuff rooms	butchers	bakery
201	Is there separate room for premises	1. Yes 2. No	/___/	/___/	/___/	/___/	/___/	/__ _/
202	Premise floor constructed of:	1. Tile/ceramics 2.Concrete 3. Plastered stone 4. Wood 5. Plain soil	/___/	/___/	/___/	/___/	/___/	/__ _/
203	Premise Floor status	1. cracked 2. Detached 3.good condition	/___/	/___/	/___/	/___/	/___/	/__ _/
204	Premise Floor cleanliness	1.Clean 2.Moderate 3.dirty	/___/	/___/	/___/	/___/	/___/	/__ _/
205	Premise wall constructed of	1.brick 2.Plastered stone 3.block 4.plastered soil 4.Plain soil 5. Other,_ _____	/___/	/___/	/___/	/___/	/___/	/__ _/
206	Premise wall status	1.cracked 2.Detached 3.holes 4 good condition	/___/	/___/	/___/	/___/	/___/	/__ _/
207	Premise wall cleanliness (dust and spider web)	1.Clean 2. Moderate 3.dirty	/___/	/___/	/___/	/___/	/___/	/__ _/
208	Premise ceiling constructed of	1.cheap wood 2.textile 3.plastic sheets 4.no ceiling 5.other specify	/___/	/___/	/___/	/___/	/___/	/__ _/
209	Premise ceiling status	1.cracked 2. Detached 3.holes 5.good cond^{n}	/___/	/___/	/___/	/___/	/___/	/__ _/
210	Premise ceiling cleanliness	1.Clean 2. Moderate 3.dirty	/___/	/___/	/___/	/___/	/___/	/__ _/
211	Does the Premise have open able window? (10% floor area)	1. Yes 2. No	/___/	/___/	/___/	/___/	/___/	/__ _/
212	Does the Premise have adequate light in which a	1. Yes 2. No	/___/	/___/	/___/	/___/	/___/	/__ _/

	healthy person can easily identify objects in the room without eyestrain?							
213	Does the Premise have adequate ventilation in which the room is reasonably free of disagreeable odor?	1. Yes 2. No	/___/	/___/	/___/	/___/	/___/	/__ _/
214	Open-able window in premise?	1. Yes 2.no	/___/	/___/	/___/	/___/	/___/	/__ _/
215	Area of window with total area?	1.<10% 2.10-15% 3.>15%	/___/	/___/	/___/	/___/	/___/	/__ _/
216	Is there covered dustbin in?	1.yes 2.no	/___/	/___/	/___/	/___/	/___/	/__ _/
216	Is there infestation of insect?	1. Yes 2. No	/___/	/___/	/___/	/___/	/___/	/__ _/
217	What type of infestation	1.flies 2.rats 3.cockroaches 4.others_____	/___/	/___/	/___/	/___/	/___/	/__ _/
218	Are there pets in premise?	1. Yes 2. No	/___/	/___/	/___/	/___/	/___/	/__ _/
219	number of food handlers by sex	_____Male _ _____female	/___/	/___/	/___/	/___/	/___/	/__ _/
220	Does premise food handler have wear outer garments/gown?	1. Yes 2. No	/___/	/___/	/___/	/___/	/___/	/__ _/
221	Food handler's hair covered?	1. Yes 2. No	/___/	/___/	/___/	/___/	/___/	/__ _/
222	food handler wear finger ornaments?	1. Yes 2. No	/___/	/___/	/___/	/___/	/___/	/__ _/
223	food handler's finger nail cut short?	1. Yes 2. No	/___/	/___/	/___/	/___/	/___/	/__ _/
224	food handler health exam card?	1. Yes 2. No	/___/	/___/	/___/	/___/	/___/	/__ _/
225	Last time food handler checked up?	1.before 3-6 month 2.ever 3.never	/___/	/___/	/___/	/___/	/___/	/__ _/

	3. Handling and cleanliness of utensils and equipments in food premises		
301	Questions	Responses	codes
302	How materials stored in raw food store?	1. on shelf 2. On pallets 3. On floor 4.others,specify _____	/___/
303	How Raw food and other non food materials stored?	1.completely separated 2.separated but side to side 3.mixed	/___/
304	Do ready to eat foods kept in clean container and covered properly?	1. Yes 2. No	/___/
305	Location and distance of kitchen from latrine?	_____ _____	/___/
306	Is a refrigerator available for preservation of food?	1. Yes 2. No (If No skip to 607)	/___/
307	does refrigerator have a fixed functional thermometer ?	1. Yes 2. No	/___/
308	does thermometer reading is < 10 ^{o}C ?	1. Yes 2. No	/___/
309	Did the foodstuff stored in refrigerator arranged properly?	1. Yes 2. No	/___/
310	Did raw and ready to it food stored together?	1. Yes 2. No	/___/
311	Is there any sign of spoilage of stored food observed?	1. Yes 2. No	/___/
312	What type of Dish/glass washing equipment?	1. Fixed sink/basin + water tap 2. Fixed sink/basin but no water tap 3.bowls/bucket 4.all 5.other,_____	/___/
313	Number of compartments for dish washing?	1.one 2.two 3. Thee	/___/
314	Do they use hot water for washing dishes?	1. Yes 2. No	/___/
315	Do they use detergent for washing dishes?	1. Yes 2. No	/___/
316	Are clean and sanitized utensils covered by clean cloth (plastic sheet) and stored in shelf or cupboard?	1. Yes 2. No	/___/
317	Location and distance of dish/cup washing from latrine?	_____ _____	/___/
318	Is there a cupboard or shelf for meat display?	1. Yes 2. No (If No skip to 709)	/___/
319	Is refrigerator available in butcher?	1. Yes 2. No	/___/
320	Chopping board is made up of	1. Wooden material 2. Concrete 3. Marble 4.Plastic 4.other, specify ____	/___/
321	Is Chopping board smooth, free of crack and easily washable?	1. Yes 2. No	/___/
322	Is meat hanger clean and made up of non-corrodible material?	1. Yes 2. No	/___/
323	Are the knives, file and others	1. Yes 2. No	/___/

	relevant equipments handled in a sanitary condition?		
324	What is used to wrap meat?	1. Appropriate Paper 2. Plastic bag 3. News paper 4. Used paper 5.Other, specify _____	/___/
325	Is a casher available in the butcher?	1. Yes 2. No	/___/
4. Provision of sanitary facilities			
401	Main source of water supply?	1. Private Pipe 2. Pipe shared 3. pipe from neighbor 4.C o m m u n a l Pipe 5. Others, specify	/___/
402	If private is water running available during inspection?	1. Yes 2. No	/___/
403	How frequent private water supply interrupted?	1. daily 2. Every other day 3.three/week 4.>3times/wk	/___/
404	For how long water supply terminated?	1.a day 2.four day 3.a week 4.more than a week	/___/
405	Material for Storage of drinking water?	1.plastic tanker 2.metal tanker 3.jerycan/bucket 4.other_____	/___/
406	Cleanliness of water storage materials?	1.clean 2.medium 3.dirty	/___/
407	Type of toilet facility?	1. Flush type 2. Dry pit latrine 3.VIP 4. Others, specify	/___/
408	If flush type/septic tank, to where plumbing connected?	1.sewerage 2.drainge 3.to river directly 4. Other specify	/___/
409	If dry pit, is height of sludge in pit less than 0.5 meter?	1. Yes 2. No	/___/
410	Is latrine free of litter, tissue papers and other dirt's like feces/urine seen around?	1. Yes 2. No	/___/
411	Separate latrine for male and female?	1. Yes 2. No	/___/
412	Urinal available ?	1. Yes 2. No	/___/
413	is toilet facility open to give service at time of Observation?	1 Yes 2. No	/___/
414	What is done when the latrine is full?	1. Desludging 3. Connecting to drainage 4.overflow until desludged 4.closed until desludged .Others, specify	/___/
415	To where waste water from hand/dish washing disposed off?	1. Septic tank/pit 2 .sewerage 3. Drainage 4.openfield 5. Others, specify_____	/___/
416	any insects breeding around the liquid waste disposal facility?	1. Yes 2. No	/___/
417	Is there hand wash facility	1. Yes 2. No(if No skip to 414)	/___/

	available?		
418	If yes, separate for clients and workers?	1. Yes 2. No	/___/
419	What type of hand wash is it?	1. Fixed sink/basin with tap 2. Fixed sink/basin without tap 3. suspended tanker to open field 4. Other, _____	/___/
420	Is the hand wash functional during inspection?	1. Yes 2. No	/___/
421	Is there any type of detergent available for hand wash?	1. Yes 2. No	/___/
422	Is there a material for solid waste storage?	1. Yes 2. No (If no skip to 420)	/___/
423	If yes, the type of solid waste storage container is:	1. metal container 2.plastic container 3.Sack/plastic bag 4. Others, specify	/___/
424	If container, condition of container? **(Circle all possible answers)**	1.tightly covered 2. Not tightly covered 3.light to move 4.not light to move 5.durable 6.not durable	/___/
425	Does the solid waste container placed at appropriate site?	1. Yes 2. No	/___/
425	Is solid waste collected by small scale crews?	1. Yes 2. No	/___/
426	If not by collected by small scale crews/delayed, where is the final disposal of solid waste?	1. to municipal container 4. On site burning 5. On site burial or to latrine 6. Others, _____ _____	/___/

Annex 7 Amharic version questionnaires to interview owners/managers of food establishments for socio-demographic information, environmental and associated factors assessment.

<u>አጠቃላይ መመሪያ</u>

አብዛኛዎቹ ጥያቄዎች የመልስ መለያ/ኮድ የተሰጣቸው ናቸው፡፡ በመሆኑም መላሹን/ተጠያቂውን በሚጠይቁበትና ምላሹን በሚመዘግቡበት ጊዜ የሚከተሉትን መመሪያዎች ይከተሉ፡፡

- እያንዳንዱን ጥያቄ በትክክል በመጠይቁ ላይ በተጻፈው መሰረት ይጠይቁ፡፡
- በመጠይቁ ላይ የተቀመጡትን በቅድሚያ መለያ/ኮድ የተሰጣቸውን ምላሾች ለመላሹ/ተጠያቂው አያንብቡ፡፡ የተጠያቂውን ምላሽ ብቻ ያዳምጡ፡፡
- ለተጠያቂው ምላሽ በመልስ ዝርዝሮቹ ውስጥ ካሉት አማራጮች ተቀራራቢ የሆኑ ምርጫዎቹን ያክቡ፡፡
- የተጠያቂውን መልስ በመይፈልጉ ጥያቄዎች ላይ አካለዊ ምልከታ በማድረግ መልሶቹን ይሙሉ፡፡

2. የምግብና መጠጥ ድርጅቱን ሃላፊ/ባለቤት ማህበራዊና ስነ-ህዝባዊ መረጃዎች እንዲሁም አካባቢያዊና ተያያዥ ሁኔታውቶች ለመዳሰስ የተዘጋጀ ጥያቄዎች			
ተ.ቁ	**ጥያቄዎች**	**መልሶች**	**መለያ ኮድ**
101	የድርጅቱ ሀላፊ/ስራ አስኪያጅ ማነው?	1.ባለቤቱ 2.ተቀጣሪ 3.ተወካይ/ዘመድ 4.ሌላ፣ይገለጽ_____	/___/
102	ድርጅቱ የንግድ ፍቃድ አለው?	1.አዎ 2.አይደለም	/___/
103	የድርጅቱ ባለቤትነት ይዞታ?	1.የግለሰብ 2.የድርጅት/ኃ/የተ/የግ/ማህበር 3.የማህበር 4.ሌላ፣ይገለጽ_____	/___/
104	የድርጅቱ የአገልግሎት ዘመን?	_____ ዓመት	/___/
105	የሃላፊው ጾታ?	1.ወንድ 2.ሴት	/___/
106	የሃላፊው ዕድሜ?	_____ ዓመት	/___/
107	የሃላፊው ሃይማኖት?	1.ክርስቲያን 2.ሙስሊም 3.ሌላ፣ይገለጹ	/___/
108	የሃላፊው የጋብቻ ሁኔታ?	1.ያላገባ 2.ያገባ 3.የተፋታ 4.አግብቶ ባል/ሚስት የሞተበ/ባት 5.የተለያዩ	/___/
109	ሃላፊው የሚያድርበት ቦታ?	1.ድርጅቱ ውስጥ 2.ከድርጅቱ ውጪ	/___/
110	የሃላፊው የትምህርተ ደረጃ?	1.ያልተማረ 2.ከ1ኛ-6ኛ ክፍል ያጠናቀቀ 3. .ከ6ኛ-12ኛ ክፍል ያጠነቀቀ 4. ከ.ከ12ኛ ክፍል በላይ	/___/
111	የሃላፊው ሙያ?	ይገለጽ፣ _____	/___/
112	ሃላፊው የምግብ ሰራተኛ ነበሩ?	1.አዎ 2.አይደለም	/___/
113	አዎ ካሉ ምን ዓይነት የምግብ ሰራተኛ ነበሩ ለምን ያህል ጊዜ?	እንደ _____ ምግብ ሰራተኛ እና ለ_____ _____ ዓመት	/___/
114	ሃላፊው በምግብ ንጽጎና አያያዝ ላይ ስልጠና ወስደው ያውቃሉ?	1.አዎ 2.አይደለም	/___/
115	አዎ ካሉ ስልጠናውን የትና ከማን ወሰዱ?	1.ከምግብ ስራ ትምህርት ቤት 2.ከጤና ጽ/ቤት 3.ሌላ፣ይገለጽ _____	/___/
116	ስልጠናውን ከጤና ጽ/ቤት ከወሰዱ ተግባራዊ አደረጉት?	1.አዎ 2.አይደለም (አዎ ካሉ ወደ ጥያቄ ቁጥር 117፣ አይደለም ካሉ ወደ ጥያቄ ቁጥር118)	/___/
117	ተግባራዊ በማድረግዎ በእርስዎ/በድርጅትዎ ላይ የፈጠረው ልዩነት?	ይግለጹ_____	/___/
118	ተግባራዊ እንዳያደርጉ ያጋጠምዎ ችግር/ሁኔታ?	ይግለጹ_____	/___/
119	የምግብ ስራ ሰራተኛ አንዴት/ከየት ይቀጥራሉ?	1.ከደላሎች 2.በስራ ቅጥር ማስታወቂያ 3.ሌሎች፣ ይገለጹ_ _____	/___/

120	የምግብ ስራ ሰራተኛ ቅጥር መስፈርት?	ነ.ከምግብ ስራ ትምህርት ተቋም ምስክር ወረቀት 2.በስራ ልምድ 3.ሌሎች፣ይገለጹ___	/___/
121	በስራ ልምድ ካሉ አነስተኛ ተፈላጊ የስራ ልምድ?	_____ ዓመት	/___/
122	የድርጅቱ ህንጻ ባለቤትነት ይዞታ?	ነ.የግል ቤት 2.የግለሰብ ኪራይ ቤት 3.የቀበሌ ኪራይ ቤት 4.የኪቤአድ ኪራይ ቤት	/___/
123	ምግብ ለማብሰል የሚጠቀሙበት የሃይል ምንጭ?	ነ.ኤሌክትሪክ 2.እንጨት 3.ነጭ ጋዝ 4.ሌሎች _____ _____	/___/
124	የድርጅቱ አማካይ ተጠቃሚዎች ብዛት በቀን?	_____ _____ ተጠቃሚዎች	/___/
125	አጠቃላይ የቤቱ/ህንጻውና የኒቢው ስፋት?	የቤቱ/ህንጻው _____ ሜ^2 እና የኒቢው _ _____ሜ^2	/___/
126	ባለፉት 5 ዓመታት ውስጥ ድርጅቱ ታድሶ/ተገንብቶ ነበር?	ነ.አዎ 2.አይደለም (አዎ ካሉ ወደ ጥያቄ ቁጥር 125፣ አይደለም ካሉ ወደ ጥያቄ ቁጥር118)	/___/
127	አዎ ካሉ ምን ዓይነት ግንባታ/ዕድሳት ነበር?	ይግለጹ _____ _____	/___/
128	ግንባታውን/እድሳቱን ያዘዘው ማን ነበር?	ነ.ጤና ተቆጣጣሪ 2.በራስ አነሳሽነት 3. ሌሎች፣ይገለጹ __ _____	/___/
129	ያዘዘው ጤና ተቆጣጣሪው ከሆነ ምክንያቱ ምን ነበር?	ነ.ንግድ ፍቀድ ለመስጠት 2.ንግድ ፍቃድ ለማደስ 3.የቁጥጥር/ክትትል ግብረ መልስ 4.ሌሎች፣ይገለጹ _____ _____ _____	/___/
130	ግንባታ ወይም ዕድሳታ የተከለከለበት ምክንያት ምን ነበር?	ነ.የግንባታ ፍቃድ አለማግኘት 2.በከተማ ፕላን ምክንያት 3.ሌሎች፣ይገለጹ_____	/___/
131	ግንባታውን የከለከለው አካል ማነው?	ነ.ማዘጋጃቤታዊ አከል 2.አከራዩ አካል 3.ሌሎች ይገለጹ	/___/
132	ድርጅቱ በአንድ ዓመት ስንት ጊዜ በጤና ተቆጣጣሪ ተጎብኝቷል?	ነ.ስድስት ጊዜ 2.አራት ጊዜ 3.ሁለት ጊዜ 4.አንድ ጊዜ 5.ተጎብኝቶ አያውቅም	/___/
133	የቁጥጥር ጉብኝቱ ምን አስተዋጽዖ አበረከተ?	ይገለጽ _____ _____	/___/
134	ከቁጥጥር ጉብኝት በኋላ የተወሰደ አስተዳደረዊ እርምጃዎች?	ነ.ማሰጠንቀቂያ 2.መታሸግ/መከሰስ 3.የገንዘብ ቅጣት 5.ሌላ፣ይገለጽ_____	/___/
135	በድርጅቱ ላይ ቁጥጥር የሚያደርጉ ተቋማት አሉ? በምን ረገድ?	ተቋማት _____ _____ በምን ረገድ _____ _____	/___/
136	ቁጥጥር አስፈላጊ ነው ብለው ያስባሉ?	ነ.አዎ 2.አይደለም(አዎ/አይደለም ካሉ ምክንያቱ_____ _____)	/___/
137	ድርጅቱ የጤና ብቃት ማረጋገጫ አግኝቷል?	ነ.አዎ 2.አይደለም	/___/
138	ለድርጅትዎ አጠቃላይ የንጽህና ሁኔታ የሚሰጡት ደረጃ?	ነ.በጣም ጥሩ 2.ጥሩ 3.መካከለኛ/ምንም አይልም 4.ደካማ 5.በጣም ደካማ	/___/
139	ለድርጅትዎ ለሰጡት ደረጃ ምክንያትዎን ይግለጹ?	_____ _____	/___/
140	ለቀጣይ የድርጅትዎ የተሻለ ንጽህና/ደረጃ ምን መስተካከል አለበት ወይም ምን ዓይነት ድጋፍ ያስፈልጋል?	_____ _____ _____	/___/

Declaration

I, the undersigned, declared that this is my work and that all sources of materials used for this thesis have duly acknowledged

Name: KASSA BULCHA

Signature: _____

Date of submission: _____

Place: Addis Ababa, Ethiopia

This thesis has been submitted for examination with my approval as University advisor.

Name of advisor: Dr. ABERA KUMIE

Signature_____

Date_____