



ADDIS ABABA UNIVERSITY COLLEGE OF HEALTH SCIENCES

SCHOOL OF PHARMACY

**ASSESSMENT OF SANITARY CONDITIONS OF FOOD SERVICE
ESTABLISHMENTS AND FOOD SAFETY KNOWLEDGE, ATTITUDE
AND PRACTICES AMONG FOOD HANDLERS IN BURAYU TOWN..**

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Assessment of Sanitary Conditions of Food Service Establishments and Food Safety Knowledge, attitude and Practices Among Food Handlers in Burayu Town, Ethiopia.

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Acronym

FBD	Food Borne Disease
FMOH	Federal Ministry of Health
USFDA	United States Food and Drug Administration
WHO	World Health Organization
EFDA	Ethiopia Food and Drug Administration
AAFMHACA	Addis Ababa Food, Medicine and Health care administration and Control authority
EPHI	Ethiopian Public Health Institute
KAP	Knowledge, Attitude and Practice

TABLE OF CONTENTS

ACKNOWLEDGMENTS	III
ACRONYM	IV
LIST OF TEBLES	VI
ABSTRACT	VII
1. INTRODUCTION	1
1.1. BACKGROUND	1
1.2. STATEMENT OF THE PROBLEM	2
1.3. SIGNIFICANCE OF THE STUDY	3
1.4. OBJECTIVES OF THE STUDY	4
1.4.1. GENERAL OBJECTIVE	4
1.4.2. SPECIFIC OBJECTIVES	4
2. LITERATURE REVIEW	5
3. MATERIAL AND METHODS	11
3.1. STUDY DESIGN.	11
3.2. STUDY AREA.	11
3.3. SOURCE OF POPULATION	11
3.4. STUDY POPULATION	11
3.5. INCLUSION AND EXCLUSION CRITERIA’S	11
3.5.1. <i>Inclusion Criteria</i>	11
3.5.2. <i>Exclusion Criteria</i>	12
3.6.1. SAMPLE SIZE DETERMINATION FOR FOOD AND DRINK ESTABLISHMENTS	12
3.6.2. THE SAMPLING PROCEDURE.....	13
3.7.1 DEPENDENT VARIABLE	13
3.7.2. <i>Independent Variables</i>	13
3.8. DATA COLLECTION PROCEDURES AND TOOLS.....	13
4. ETHICAL CONSIDERATION	15
4.1. PLAN FOR DISSEMINATION OF FINDINGS	15
4.2. DATA ANALYSIS	15
5. RESULTS AND DISCUSSION	16
5. STRENGTH AND LIMITATIONS OF THE STUDY	29
6. CONCLUSION	29
RECOMMENDATIONS	31
7. REFERENCE	32
8. ANNEXES	35
ANNEX 2: CONSENT FORM	35
WALIIGALT.1(ANNEX-4) AFAAN OROMOO VERSION QUESTIONER.....	45

List of Tables

Table1: The socio-demographic characteristics of food handlers in food and drink establishments of Burayu town-----	16
Table2: Food handling knowledge of food handlers working in food and drink establishments of Burayu town-----	18
Table3: Over all Food handling Knowledge presents score of food handlers---	19
Table4: Attitude of food handlers among food safety and hygiene in Burayu town -----	21
Table5: Over all attitudes of food handlers among food safety and hygiene in Burayu town---	22
Table6. Food handling Practice scores of food handlers in Burayu town -----	23
Table7: Over all Food handling Practice scores of food handlers in Burayu town-----	25
Table8: Sanitary condition of food and drink establishments in Burayu town-----	26
Table9: Over all Sanitary condition of food and drink establishments in Burayu town-----	28
Table10: Correlation coefficient between significant-----	29

Abstract

Background: Poor knowledge, attitude and practices of hygiene can contribute to the outbreaks of food borne illness. Most foods could be affected by food borne pathogens mainly due to poor hygienic conditions and inappropriate food handling practices. Inadequate knowledge, negative attitude and practices on food hygiene and poor sanitary condition of food and drink establishments are among the factors responsible for the occurrence of poor hygienic conditions and inappropriate food handling practices.

Objective: To assess knowledge, attitude and practice of food safety among food handlers and investigate sanitary condition of food service establishments in Burayu town.

Method of study: Across-sectional descriptive study was conducted to assess knowledge, attitude and practice of food safety among selected food handlers (working on food preparation) and to investigate sanitary condition of selected food service establishments (butcher, café, milk house, and juice house). Food and drink establishments were selected by simple random sampling technique. Data was collected using pre-prepared standardized questionnaire and entered using Epi info and analysis was performed by using SPSS version 25.

Results:- Overall, 78.8% of the respondents have good knowledge on food hygiene and safety requirements. 57.6 % of food handlers have positive attitude towards food safety and handling practices. Regarding the overall practice score of the food handlers, nearly half (51.1%) of the food handlers had good food safety and hygiene practice with a practice score or greater than 50%. Among assessed food and drink establishments, 32 (19.5%) of them had a green, 37 (22.6%) of them yellow, and 29 (17.7%) of them had red status and 66 (40.2%) of them were not complying with the standard.

Conclusion- Overall, food handlers have good knowledge and practices with positive attitude towards food hygiene and safety requirements. Specifically, almost more than 70% of food handlers knew the fact that hand washing practices before work can reduce risk of food contamination. With regard to sanitary condition issues of the establishments, the study found out that their overall level of food and drink establishments was poor.

The largest proportion, 66 (40.2%) of food and drink establishments were not complying with the standard and also, 29 (17.7%) of food and drink establishments were at red status.

1. Introduction

1.1. Background

The World Health Organization (WHO) estimated that in developed countries up to 30% of the population suffer from food borne diseases each year, whereas in developing countries up to 2 million deaths are estimated per year. Moreover, in developing countries up to an estimated 70 % of cases of diarrheal diseases are associated with the consumption of contaminated food. It is estimated 16 million new cases and 600,000 deaths of typhoid fever each year.(1)

In developing countries, approximately 10 to 20% of food-borne disease (FBD) outbreaks are due to food contamination in public food establishments, food handlers are the first responsible bodies to contaminate food by acting as either a biological or a physical carrier for many pathogenic organisms (2)

Food can be contaminated from production up to consumption. Producers, shippers, processors, distributors and food handlers have the responsibility in ensuring the safety of food. Such Contaminants get access to contaminate food mainly due to food handler's poor knowledge and negligence during handling activities. (3)

The term "food safety" is increasingly being used in place of food hygiene and encompasses a whole range of issues that must be addressed for ensuring safety of the prepared food. Food hygiene probably put too much emphasis on cleanliness but food safety requires much more than a clean premises (Food Hygiene Safety). (4)

Accordingly, food handlers with poor personal hygiene and lack of awareness of important issues in preventing food borne diseases, working in food establishments could be potential sources of infections of many intestinal helminthes of protozoa and estrogenic pathogens(5)

The various food borne diseases are botulism, Campylo-bacteriosis, hepatitis A, Norovirus infection, salmonellosis, shigellosis, diarrhea, typhoid, food poisoning, amoebiasis, ascariasis, hook worm infections etc.(5)

Around 600 million food borne illnesses and 420,000 deaths occur each year due to poor food handling practice. Among ten people, one becomes ill from ingestion of contaminated food (6) Moreover, in developing countries up to 2 million deaths are estimated per year associated with

the consumption of contaminated food(6).This is due to lack of Food handling practices, environmental and personal hygiene, knowledge of food hygiene and safety of food handlers.(7) The number of people eating outside their homes is expected to increase,(according to hygiene national report Ethiopia-(2016), which in turn demands for more food establishments.As far as our knowledge is concerned, there is no or little research conducted on food safety knowledge and practice of food handler and sanitary condition of food establishments in Burayu town and evidence based result was totally scarce in the country at large. Moreover, in Ethiopia, the coordination activities particularly at lower levels of government bodies are so weak.There is no clearly defined responsibility to control,monitor and evaluate food handlers of food establishments.In studies conducted in Diredawa and Arbaminch, results showed that prevalence of good food handling practice was 52.4% and 32.6%, respectively (8, 9)

Therefore,it is crucial to conduct a repeated study aiming at knowledge, attitude and practice of food safety among food handlers and sanitary condition of food service establishments in Burayu town.

1.2. Statement of the Problem

WHO-estimated that in developing countries up to an estimated 70 % cases of diarrheal diseases are associated with the consumption of contaminated food and estimated 16 million new cases and 600,000 deaths of typhoid fever each year.(1) Billions Of people in the world are at risk of unsafe food. Many millions become sick while hundreds of thousands die every year because they consume unsafe food.(6) The cause of such crises is due to lack of Food handling practices, environmental and personal hygiene, knowledge of food hygiene and safety of food handlers.(6) 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 Conditio.(3) Many people especially in rural areas of Ethiopia die due to consumption of raw meat contaminated with Anthrax bacteria (*Bacillus anthracis*) (3)

Ethiopian Public Health Institute (EPHI) has conducted a senses in Addis Ababa (published 2020) to assess the status of selected food and drink establishments in Addis Ababa. Accordingly, among 368 café, 117 of them had green, 64 of them had yellow, 105 of them had red and 82 of them had indicating that they didn't comply with the standard. Among 921 juice and

vegetables establishments 284 of them had green,241 yellow,165 red and 231 had didn't comply with the standard.Among 450 diary product establishments,114 of them had in green,137 had yellow,74 had red status and 125 were under the level indicating that they don't comply with the standard. Out of 914 butchers the same of (341) were green,198 were yellow,232 were red, and 143 didn't comply with the standard.Among 780 restaurants, same of (232) were in green status and 177 didn't comply with the standard.

The number of people eating outside their homes is expected to increase which in turn demands for more food establishments. According to Burayu town health office report of 2019/2020, Food borne disease is one of the diseases among 10 top diseases in Burayu town.So this study is used to identify the gapes of food safety and hygiene among food handlers and sanitary condition of food establishments in Burayu town.

1.3. Significance of the study

Even though there are a number of similar studies conducted in different towns of Ethiopia; such as in Addis Ababa city,Dire dawa and Arbaminch,the applicability of findings and recommendations of those studies to the current study area may not work due to variations in reference time and existing particular environmental factors.

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 will be forward from the study differs in urban and rural contexts in which the activities takes place. The finding of this study is generate information that can help Burayu town, consumers, and other relevant stakeholders to understand the level of sanitary condition in the town and help the regulatory efforts to improve sanitary conditions of food and drink establishments.Also the finding of this study will be used as base line data for further study.

1.4. Objectives of the study

1.4.1. General Objective

To assess knowledge, attitude and practice of food safety among food handlers and sanitary condition of food service establishments in Burayu town.

1.4.2. Specific objectives

- To determine food handling knowledge of food handlers in food service establishments.
- To assess Food handling practice in food service establishments.
- To assess the attitude of food handling practice of food handlers in food service establishments
- To assess sanitary conditions of food service establishments

2. Literature review

Literature review was done through overview of principles of food safety and hygiene practice, global and local burden of food borne disease, public health importance of food and drink establishments, 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 the town health inspectors and information gathering from health office.

2.1. Global burden of food borne disease

The World Health Organization (WHO) (report of 2011) estimated that in developed countries up to 30% of the population suffer from food borne diseases each year, whereas in developing countries up to two million deaths are estimated per year. Moreover, in developing countries up to an estimated 70 % of cases of diarrheal diseases are associated with the consumption of contaminated food. (1)

WHO estimated 16 million new cases and 600,000 deaths of typhoid fever each year.(6)

The lack of hygiene and safety practices is a major contributor of foodborne outbreaks and it has a great influence on consumers. Each year over two million people die from diarrheal diseases, many of which are acquired from eating contaminated food from food services establishments.(10)

Food elaborated with satisfactory hygienic standards is one of the essential conditions for promoting and preventing health, and inadequate control is one of the factors responsible for the occurrence of food borne disease outbreaks poor personal hygiene by food handlers frequently contributes to outbreaks of food borne illness caused by staphylococcus aureus (*S.aureus*) and gram negative bacilli such as *Salmonella* spp., *Shigella* spp., *Campylobacter jejuni*, Enterotoxigenic *E.coli* as well as viral agents, such as hepatitis A, and Norovirus.(5)

The importance of hand hygiene in the control of infection cannot be under-emphasized although, hand-washing may seem trivial to the food staff, failing to do it can have tragic consequences. It is generally accepted that the hands of food handlers are an important vehicle of food cross-contamination and that improved personal hygiene and scrupulous hand washing

would lead to the basic control of feces-to-hand to-mouth spread of potentially pathogenic transient microorganisms (9).

2.2. Sanitary condition of food and drink establishments in Ethiopia

Sanitary conditions of many food 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 (11).

According to the study of sanitary conditions of food establishments in Mekelle town in 2007, Onsite solid waste storage containers/receptacles were available in 408(97%) establishments. One hundred ninety one (46.8%) receptacles were sacks, 143(35%) were barrels, 29(7.1%) were plastic buckets, 25(6.1%) were dustbins and the other 20(4.9%) were other types of temporary receptacles like cartons. More than one third (38.1%) of the establishments had the proper type of receptacles.(9)

According to studies of sanitary condition studied in Bardar town by Mulugeta Kibret and Bayeh Abera in 2012 about 66 % of the establishments have flush toilets, 27.7% have dry pit latrines while 5.9% of the establishments have no toilets. Nearly fifty per cent of the establishments have a proper liquid waste disposal system and only 33.6% have a proper solid waste collection receptacle with a lid.(12)

2.3. Cause of poor personal hygiene food handlers on food establishment.

The poor personal hygiene of food handlers has been associated with foodborne illness outbreaks. It is important that the issue of hygiene practices and hygiene knowledge is addressed in food service establishments in ensuring that food is safe for consumption.

A food hygiene mistake in a restaurant, serving hundreds and thousands of customers has the potential to make many people ill. Food hygiene is important in food service establishment.

The term “food safety” is increasingly being used in place of food hygiene and encompasses a whole range of issues that must be addressed for ensuring safety of the prepared food.(5)

Although the majority of food handlers adhered to basic hygiene principles, there is definitely a need for proper and continuous training in personal and general hygiene, not only for food handlers, but also for management. Improper handling is responsible for most cases of food

borne illness. Food handlers are a common source of food borne diseases. The practice of good personal hygiene is essential for anyone who handles food, especially in food and drink establishments where many customers could potentially be affected. A sick food handler with symptoms of diarrhea, eye and ear discharges, skin infections, open cuts and wounds, or coughing should not continue working. They must be treated and be completely recovered before returning to work (13)

The various food borne diseases are botulism, campylobacteriosis, hepatitis A, norovirus infection, salmonellosis, shigellosis, diarrhea, typhoid, food poisoning, amoebiasis, ascariasis, hook worm infections etc. (5)

Food prepared in large amount is vulnerable for contamination and may lead to the occurrence of food borne outbreaks unless basic sanitary practices are well maintained.

Therefore, food establishment serving a large number of individuals are responsible to provide safe and wholesome food for their consumers (14).

2.4. Food borne disease occurrence and hygienic condition of food and drink establishments: In the African countries context

Even if data regarding food borne diseases in the African Region are extremely scarce, the following pathogens are prevalent: Campylobacter, Salmonella, Shigella, Hepatitis, Brucella, Staphylococcus aureus, Bacillus cereus, Escherichia coli, and rotavirus. Foodborne bacterial infections are particularly common (11)

A food hygiene mistake in a restaurant, serving hundreds and thousands of customers has the potential to make many people ill. Food hygiene is important in food service because of the high numbers of meals served every day. Foodborne outbreaks resulting from such mass restaurant facilities have been reported worldwide (Jong & Angulo, 2010). Food hygiene is ultimate in food service because of the high numbers of meals served every day. Food-borne outbreaks resulting from such mass restaurant facilities have been reported worldwide (Jones & Angelo, 2010). It is important that foodservice establishment managers or people in charge enforce hygiene practices especially on food handlers.

The issue or concern of foodborne illness outbreaks are a serious factor as several incidents have been reported across the globe.

Food handlers play a significant role in ensuring food is safe throughout the chain of production and storage, therefore it is important that the food handling personnel are educated on hygiene and also follow hygiene practices such as thorough washing of hands before handling food using

soap, wearing clean uniform on duty, washing their hands after using the toilet and other hygiene practices.(11)

Accordingly, consumers are highly concerned about foodborne diseases at foodservice establishments. Responding to this concern, many governments have made a great deal of effort to inspect foodservice establishments properly. Restaurants that fail to meet the minimum requirements and standards of food safety and hygiene can face enforcement penalties. Food safety inspectors have a range of options, including voluntary and involuntary enforcement action, to ensure that an adequate level of enforcement is available for offending restaurant owners (Choi, Maclaurin & Ju-Eun Cho, 2015).(10)

2.5. Premises of hygienic condition for 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 (11).

Construction of premises(walls, floors and ceilings cleanliness Lighting and Ventilation system),Kitchen and food preparation site handling and cleanliness, Infestation of flies, availability of Washing basins/facilities for utensils & equipment,Bactericidal treatment of any eating and cooking utensils.Food handlers health and hygiene,availability of Refrigerators for storage of perishable food Adequate and whole some water supply from approved source, Adequate toilet and lavatory facilities for customers and workers,Conveniently located and accessible Showers for males and females Proper waste collection and disposal system (solid and liquid waste)are basic Sanitary requirements of catering establishments (15,16).

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 (15).

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 hand washing facility,toilet facility,liquid and solid waste management, water supply, and infestation of vectors are some of the factors that affect food safety (16).One

possible source of food contaminations could be dissemination of the pathogens to foods and/or utensils of food production centers through small animals such as cockroaches that live closely with humans in urban environments (16). 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 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 .

2.6. Cleaning and Sanitizing Facilities

All food establishments shall provide sinks and drain-boards of sufficient size to permit the complete immersion of the largest utensils and each compartment of the sink shall be supplied with hot and cold running water. All said sinks shall have attached drain boards and shall be constructed of galvanized metal or better, suitably reinforced and of such thickness and design so as to resist denting, buckling, and sloped so as to be self-draining (13).

A food hygiene oversight or negligence in a restaurant serving hundreds or thousands of customers has the potential to make many people ill. The five main risk factors that contribute to foodborne illness outbreaks in restaurants are improper holding temperature of food, poor personal hygiene of food handlers, inadequate cooking, contaminated equipment, and unsafe food (Hertzman & Barrash, 2011). Poor knowledge of hygiene and practices can also contribute to outbreaks of foodborne illness (Kumusa, 2016). According to the WHO (2010) food handlers play a significant role in ensuring food is safe throughout the chain of production and storage, therefore it is important that the food handling personnel are educated on hygiene and also follow hygiene practices such as thorough washing of hands before handling food using soap, wearing clean uniform on duty, washing their hands after using the toilet and other hygiene practices. (African Journal of Hospitality, Tourism and Leisure, Volume 7 (4) - (2018)(8)

2.7. Description of framorks

The framework of this study is 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:-

2.7.1. Environmental factors within which the food establishment provides its service such as: Availability of free land space in the establishment for food materials storage, access to safe

water supply and safe Waste handling and disposal facility, environmental healthy codes and guidelines...etc.

2.7.2. Physical housing and sanitary condition of establishment building and cleanliness

total area and location of establishment, building and institution sanitary status, housing premises cleanliness condition, provision of hand wash ,latrine, urinals, liquid waste disposal facilities, solid waste storage and handling, wall, ceiling and floor status of food premise rooms,...etc.

2.7.3. Personal factors

Socio-demographic information of food handlers food handling practice, training on food hygiene, profession and experience...etc. the framework is developed through 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 was used to design and insure that the general and specific objectives could be addressed with the prepared/suggested data collection tools and methods.

3. Material and Methods.

3.1. Study design.

Across-sectional descriptive study was conducted on assessing knowledge, attitude and practice of food safety among selected food handlers(working on food preparation) and sanitary condition of selected food service establishments (butcher, café, milk house, and juice house) in Burayu Town from May to June 2021.

3.2. Study area.

The study area was Burayu Town. As per definition of Oromia National Regional State and as recognized by Ministry of Urban Development and Construction, Burayu town is one of the first grade towns in Oromia National Regional State located at 15 km to west of Addis Ababa, the capital city of Ethiopia. Burayu town is one of the fastest growing towns in Oromia National Regional State of Ethiopia. Burayu town have an estimated total population of 150,000 of which about 51 and 49% are women and men, respectively. The number of establishment in the town is increasing as a result of urbanization and active movement of people from place to place and from rural to urban like other towns in Ethiopia.

3.3. Source of population

The Source of populations for this study was, all food and drink establishments and food handlers of food and drink establishment in Burayu Town.

3.4. Study population

Selected food and drink establishments (butchery, café, milk house and juice house) and all food handlers' participating on food preparation in the selected food and drink establishments in Burayu Town

3.5. Inclusion and Exclusion Criteria's

3.5.1. Inclusion Criteria

Food handlers who were working on food preparation and processing of the selected food and drink establishments at the time of the study and who were volunteer were included regardless of their sex, and employment status.

3.5.2. Exclusion Criteria

Food handlers with mental illness, unable to hear or generally those who could not communicate due to serious illness and which have no direct connection with food preparation were excluded from the study.

3.6. Sample size and sampling procedures

3.6.1. Sample size Determination for food and drink establishments

The total number of the selected food and drink establishments in Burayu town was 238 according to report disseminated by the trade and industry of the town.

Sample size is determined using the formula Yaman's (Nokye M. Adam, 2020) proportion and assuming that all food and drink establishments are assessed and all food handlers working on food preparation were interviewed among food handlers, 95% level of confidence and 5% margin of error.

$$n = N / [1 + N(e^2)]$$

Where

n= is required sample size

N= number of selected food and drink establishment (milk house, butcher, café, juice house) found in Burayu town

.e= margin of error

Therefore, sample size is determined by using Yaman's formula as follows

$$n = N / [1 + N(e^2)]$$

$$n = 238 / [1 + 238(0.05)^2]$$

$$n = \underline{149}$$

Considering 10% contingency, total sample size of establishments became 164. So n=164

Regarding the sample size determination for the KAP study, all of the food handlers who were actively involved in food preparation were selected, and their total number was 231.

3.6.2. The sampling procedure

Total list of the existing selected food and drink establishments (milk house, butcher, café, juice house) was obtained from the Town trade and industry.

The food and drink establishments that was obtained from trade and industry was considered as the sampling frame and selected by simple random sampling technique. Then the first establishments was selected by lottery method from each of the selected food and drink establishments and data was collected randomly until final sample (164) were reached.

3.7. Variables of the study

3.7.1 Dependent Variable

Sanitary conditions and availability of sanitary facilities like, water supply, toilet facility, food utensil and equipment cleanliness, hand washing basin availability, waste disposal mechanism Knowledge of food handlers and availability of dish washing facility.

3.7.2. Independent Variables

Organizational factors and socio-demographic factors such as Educational level, age and gender, work experience and training status of food handlers, personal hygiene status of food handlers.

3.8. Data collection procedures and tools

Data was collected using pre-prepared standardized questionnaire which have been developed based on the related published studies with certain modification for assessing food hygiene knowledge, attitude and practices of food handlers, and sanitary condition of food and drink establishments.

The questionnaire was prepared first in English version and then translated to Afan Oromo which is the local language of Oromya regional state and Amharic versions for food handlers do not know Afan Oromo language and back to English to confirm the correctness of the translation. The questionnaire was composed of two parts, the first part contained questions related to the socio-demographic and the second part contained questions related to knowledge, attitude and practice of the study population towards food safety.

Observational checklist related to sanitary conditions of establishments was administered by data collectors.

Interviews was conducted by data collectors to food handlers to collect data conserned to KAP in food and drink establishment in Burayu Town.Data was collected by ten BSc environmental health professionals and two supervisors who have BSc in Environmental health after taking two days of training.Additionally,one principal investigator was included to check the completeness of questionnaires during data collection.

3.9. Operational definition

Knowledge -A checklist was used by data collectors to assess the food handlers' food handling knowledge.There were ten statements for each participant to assess the food hygiene and sfety Knowledge.Each question had two choices.A correct answer was given 1 score, whereas a 0 score was given for a wrong answer. The scores varied from 0 to 10 points and were classified into two levels as-A score of 50% and below were defined as poor knowledge and a score above 50% was defined as good knowledge.

Food handling practice- A checklist was used by data collectors to assess the food handlers' food handling practice.There were eighteen statements for each participant to assess the food handling practice. Each question had two choices. A correct answer was given 1 score, where as a 0 score was given for a wrong answer.The scores varied from 0 to 18 points and were classified into two levels as-A score of 50% and below were defined as poor practice and a score above 50% were defined as good practice.

Attitude towards food safety and hygiene: There were ten statements for each participant in this part and the workers were asked regarding the food handling attitude.The scores ranged from 0 to 10 which were converted to 100% based on the number of correct answers scored by the respondents.with statements describing attitudes towards food safety (1=strongly disagree, 2=disagree, 3=uncertain, 4 =agree and 5=strongly agree.) A score of correct answer or "1" was given to answers with "agree" or "strongly agree" whereas a score of "0" or incorrect answer was given to "strongly disagree", "disagree" or "uncertain".

Missing response towards the statements were treated as "no opinion" and assigned as uncertain value.The scores obtained were considered positive attituded if above 50% and negative attituded if below 50%.

Sanitary conditions of food service establishments: 17 observetional ckecklist items were prepared to assess food and drink establishments' sanitary condition and status were classifies in

to four categories as Green, Yellow, Red, and not comply with the standard as scored 0 to 17 items.

Green means if a facility scored 75% and above.

Yellow means if a facility scored 65 to 74.99%.

Red means if a facility scored 50 to 64.99%.

Not comply with the standard means if a facility scored below 50 percent.

The ranking system is obtained from EPHI who has done sances on food and drink establishments in Addis Ababa (26).

4. Ethical consideration

Ethical clearance was obtained from Ethical review committee of College of Health Science of Addis Ababa University. Letter of cooperation and support from the university together with the ethical approval letter was presented to Oromiya regional state health bureau, Burayu Town Municipality, Trade and Industry. Moreover, all the study participants was informed about the purpose and benefit of the study along with their right to refuse. Confidentiality and privacy of study participants was assured by using questionnaire identification number during the sample collection period.

4.1. Plan for dissemination of findings

The Findings of this study is communicated and disseminated to Addis Ababa University College of Health Science, Department of Social pharmacy and it will be published on scientific journal and used for application of Burayu Town FDA as an inspection focus area.

4.2. Data analysis

The data obtained from the respondents was analyzed using SPSS software version 25.0 the significance of differences was considered at 95% confidence interval ($P < 0.05$). The data analysis methodologies is in line with the aim and design of this study. Before the actual data possessing re-entry of 5% of the data to Epi-Info software package was made to maintain the data quality.

5. Results and Discussion

Socio-Demographic Characteristics of the food handlers -

The socio-demographic data of the food handlers is presented in Table 1. Majority 169(73.2%) of the food handlers were females and 62(26.8%) were males where most of the food handlers 145(62.8%) were between 18 and 30 years of age. Half of them 116(50.2%) of the food handlers completed secondary school (Grade 7-12) and only 2(0.9%) of them had no formal education. Most of the food handlers 124(53.7%) were married while 89 (38.5%) of them were single. Only 60(26.0%) of all food handlers in the study received food hygiene training. About 126 (54.5%) of the respondents have 1 to 6 years of work experience and those who have been working more than 13 years represented only 10% in the year group. 78(33.8%) of food handlers monthly income was in the range of 1000-2000 Ethiopian birr. Some (9.5%) of food handlers Monthly income is less than 1000 Ethiopian birr and only 7.8% of food handlers' got more than 3,500 Ethiopian birr per month.

Table 1. The socio-demographic characteristics of food handlers in food and drink establishments of Burayu town (N=231 Food handlers)

Characteristics	Frequency	Percent
sex		
Male	62	26.8
Female	169	73.2
Age		
<18 year	2	.9
18-30years	145	62.8
31-42	59	25.5
43-54	11	4.8
>55	14	6.1
Marital status		
Single	89	38.5
Married	124	53.7
Divorced	8	3.5
Widowed	10	4.3
Service year of food handler		
<1 year	47	15.2
1-6	126	54.5

7-12	35	20.3
13+	23	10.0
Educational status		
Not educated	2	.9
Grade 1-6	101	43.7
Grade 7-12	116	50.2
Above grade 12	12	5.2
Food hygiene Training received		
Yes	60	26.0
No	171	74.0
Monthly income		
<1000birr	22	9.5
1000-2000	78	33.8
2000-2500	58	25.1
2500-3500	55	23.8
> 3500	18	7.8

Food handling knowledge of food handlers working in food and drink establishments of Burayu town

Most of the food handlers 159(68.8%) responded that it is possible to control food contamination by avoiding touching ready to eat prepared foods with bare hands and they also control the temperature of foods by keeping them at the right temperature, this is a good hygiene practice as touching foods with bare hands and improper holding temperature leads to contamination.

Our findings also showed that out of the food handlers that were interviewed, 143(61.9%) of them were aware that food contamination could be controlled by keeping the floor and walls clean and,131(56.7 %) of the food handlers knows that contamination could be controlled by washing their hands. Most of food handlers 165(71.4%) also knows the fact that washing hands before handling food is very important to minimize risk of food contamination. 159 (68.8%) of the food handlers were also aware that food contamination can be controlled by avoiding touching their body during food preparation.

More than half, 141(61.0%) of the food handlers believed that proper hygiene is very important to prevent illness that could possibly occur due to food contamination. This kind of food safety knowledge is very crucial as poor personal hygiene frequently contributes to foodborne illnesses

which indicate that food handlers' knowledge and handling practices needs to be improved (Kusuma, 2016).

This research also found out that 125(54.1%) of the food handlers were aware that washing removes contamination and sanitizing destroys micro-organisms.

This finding clearly indicating that more than half of the food handlers have knowledge on the difference between sanitizing and washing, but it is not every food handler who has that kind of knowledge. There fore, an on-going training of food handlers is very crucial towards maintaining good standards of hygiene knowledge.

With regard to the use of hand sanitizer and tissue paper, our research investigated that, 135(58.4%) of respondents believed that use of hand sanitizer and tissue paper gloves can substitutes for hand washing. This clearly indicats the need of training to the food handlers on the awareness of hand washing as the results are unsatisfactory since more than half of the food handlers do believe that hand sanitizer and gloves substitute proper hand washing. It is essential that food handlers' should not wear any hand jewelers during food preparation and keep fingernails cut short and cleans (Addis Ababa FMHACA Standards of 2017). In contrast, this finding showed that most of the food handlers, 146(63.4%) did not know that wearing wedding band and arm rings is not allowed in the preparation area. But most of the food handlers (69.3%) know that a separate new glove should be used when handling each type of foods, indicating that the gloves used to handle fruits should not be used to handle meat.

Table2. Food handling knowledge of food handlers working in food and drink establishments of Burayu town (N=231 Food handlers).

Statements	Response	Frequency	Percent
Food handlers can control contamination by avoiding touching ready to-eat prepared food with bare hands	No	72	31.2
	Yes	159	68.8
	Total	231	100.0
Food handlers can control contamination by Keeping the floor and walls of the room clean	No	88	38.1
	Yes	143	61.9
	Total	231	100.0
Food handlers can control contamination by washing their hands	No	100	43.3
	Yes	131	56.7
	Total	231	100.0
Food handlers should wash their hands before	No	66	28.6

handling food	Yes	165	71.4
	Total	231	100.0
Hygiene is important to prevent illness due to food contamination	No	90	39.0
	Yes	141	61.0
	Total	231	100.0
Washing removes contamination and sanitizing destroys microorganisms	No	106	45.9
	Yes	125	54.1
	Total	231	100.0
Food handlers should avoid touching their body during food preparation	No	72	31.2
	Yes	159	68.8
	Total	231	100.0
Hand sanitizer and tissue paper gloves can substitutes for hand washing	No	96	41.6
	Yes	135	58.4
	Total	231	100.0
Arm ring and Wedding band jewelers are not allowed to wear in the kitchen	No	85	36.8
	Yes	146	63.2
	Total	231	100.0
The same gloves used when handling fruits can also be used to handle meat	No	160	69.3
	Yes	71	30.7
	Total	231	100.0

Overall, 78.8% of the respondents scored more than 50% and only 21.2% of the respondents scored less than 50%, which shows that the respondents have good knowledge on food safety and food hygiene (>50%). This is in line with the study done by Abdul-Mutalib *et al.* (2018), Tan *et al.* (2013) and Stenger *et al.* (2014) that showed good food handlers' knowledge score (>50%) among food handlers in food and drink establishments in Bahir Dar town.

Table3. Over all Food handling Knowledge status of food handlers (N=231)

Knowledge score		Frequency	Percent
Poor knowledge	Knowledge score <50%	49	21.2
Good knowledge	Knowledge score >50%	182	78.8
Total		231	100.0

Attitude of food handlers among food safety and hygiene, in Burayu town.

Most of the food handlers (94.8%) responded that it is good to maintain personal cleanliness while working and about 57.2% food handlers agreed on the importance of food hygiene training to reduce risk of contamination. Similarly Abdullah Sani and Siow (2014) found that attitude scores of trained food handlers were higher than those who have not attended any food safety training. However, it has been reported that, although food hygiene training may increase food

safety knowledge, it is not the main factor that influences food handling behaviour and practice changes (McIntyre *et al.*, 2013).

Our findings also showed that out of the food handlers that were interviewed 95(41.13%) of food handlers responded positively towards separation of raw and cooked food, but surprisingly, 136(58.87%) of food handlers responded negatively towards the statement. Separation of raw and cooked foods is important as raw food contains high level of microorganisms that may be pathogenic.

Although, most of the food handlers 133(57.6%) stated that they agree that cleaning hands effectively could prevent foodborne diseases, some 98(42.4%) of the respondents showed negative attitude. Regarding the usage of gloves, 37(16.02%) food handlers either agreed or strongly agreed that hand washing is required before putting on gloves, but most of food handlers 194(83.98%) showed negative attitude towards using glove. Some 22(9.6%) of the respondents have positive attitudes, in that they should wear gloves to avoid touching ready to-eat prepared foods with bare hands to reduce contamination. Where as, most of the respondents 209(90.5%) showed negative attitude towards wearing glove. Effective hand washing and using gloves are also necessary in handling ready-to-eat foods since hands are in regular contact with the environment and likely vehicle transmission for bacteria.

High percentage (71.43%) of the food handlers responded positively that one should take leave if suffering from any foodborne illness. Foodborne illness is a communicable disease because it is easily transmitted if precautions are not taken. Therefore, food handlers with foodborne illness should refrain from handling foods since it is well known that food handlers play a significant role in transmission of foodborne pathogens to the public during food preparation (Smigic *et al.*, 2016). Almost all (90.3%) of the food handlers were certain that well-cooked foods are free from contamination (Abd Lataf Dora-Liyana *et al.*, 2018). This study also showed that from all interviewed food handlers 144(62.3%) of the respondents answered concerning to cooked foods were uncertain. About 137(59.3%) were agreed that it is important to check the refrigerators or freezers periodically to ensure it is well functioning. Similarly the study result that reported by (Abdullah Sani and Siow *et al.*, 2014) mentioned that 56.9% of respondents also agreed that not monitoring refrigerator and freezer temperatures might be harmful to health. Maintaining proper temperature of the refrigerator is important to maintain microbiological and sensory quality in food thus keeping it safe and better for consumption (Dora-Liyana *et al.*, 2018).

Table4. Attitude of food handlers among food safety and hygiene in Burayu town (N=231 Food handlers).

	Statements	Strongly disagree, n (%)	Disagree, n (%)	Uncertain, n (%)	Agree, n (%)	Strongly agree, n (%)
1	Proper food handling is an essential part of my responsibility at work	0	6(2.6)	6(2.6)	167(72.3)	52(22.5)
2	I think that it is good to maintain a high degree of personal cleanliness while working	0	6(2.6)	6(2.6)	119(51.5)	100 (43.3)
3	Food hygiene training for handlers is an important issue to reduce the risk of food contamination	4(1.7)	47(20.7)	48(20.8)	115(49.8)	17(7.4)
4	Raw foods should be kept separately from cooked foods	2(9)	67(29.0)	67(29,00)	77(33.3)	18(7.8)
5	Cleaning my hands effectively can prevent foodborne diseases	3(1.3)	41(17.7)	54((23.4)	122(52.8)	11(4.8)
6	I should wash my hands before putting gloves	12(5.2)	97(42.0)	85(36.8)	17(7.4)	20(8.7)
7	The use of gloves could reduce the contamination risk while handling ready-to-eat foods	30(13.0)	101(43.7)	78(33.8)	11(4.8)	11(4.8)
8	I should take leave and should not work on the food premises if I am suffering from foodborne illness	1(4)	21(9.1)	44(19,0)	148(64.1)	17(7.4)
9	Well-cooked foods are free from contamination	5(2.2)	7(3.0)	144(62.3)	57(24.7)	17(7.4)
10	It is necessary to check the temperature of refrigerators/ freezers periodically to ensure it is functioning properly	0	18(7.8)	76(32.9)	118((51.1)	19(8.2)

Over all, 133(57.6%) of the respondents scored more than 50% and only 42.4% of the respondents scored less than 50%, which shows that the respondents have positive attitude on food safety and food hygiene (>50%). The present study towards food safety attitude shows a

high score and some past studies have shown similar results. (Abdullah Sani & Siow, 2014; McIntyre, Vallaster, Wilcott, Henderson, & Kosatsky, 2013; Sharif, Obaidat, & Al-Dalalah, 2013). A positive attitude was detected in a large majority (94.8%) of the food handlers who either agreed or strongly agreed that proper food handling is an essential part of a food handler's responsibility at work. Similar results were found by McIntyre *et al.* (30 Jun 2019), Sharif, Obaidat, and Al-Dalalah (2013).

Table 5. Over all attitude of food handlers among food safety and hygiene in Burayu town (N=231 Food handlers).

Attitude score		Frequency	Percent
Negative attitude	attitude score < 50%	98	42.4
Positive attitude	attitudescore > 50%	133	57.6
Total		231	100.0

Practice of food handlers in food service establishments of Buratu town.

This study results showed that 158 (68.4%) of the food handlers responded that they stored raw food on shelf or pallets and 158 (68.4%) of the food handlers stored raw food and other non food materials separately. But 70 (31.6%) of food handlers do not use the proper storing system of food items. Based on the study conducted by Sharif *et al.* (2013) and Abdul-Mutalib *et al.* (2012), about 90% and 85.9% respondents, respectively do not apply with this unhygienic practice.

More than half of the respondents, 163 (70.6%) admitted to storing raw and cooked foods in separate and kept in clean container and covered. Separate storage of raw and cooked or ready-to-eat foods should be practiced to prevent cross-contamination. This is most likely because presence of outsiders causes sudden changes in food hygiene practices.

Temperature control of ready to eat food and cooked food are crucial steps in food and drink establishments to prevent the growth of foodborne pathogen to an infectious level. Moreover, improper storage of ready to eat food facilitates the growth of *Listeria monocytogenes* to an infectious level (Derens-Bertheau, Osswald, Laguerre, & Alvarez, 2015). This study showed that, 154 (66.7%) of establishments had refrigerator and 70.6% of food handlers used the proper food storing system in the refrigerators. But in some establishments, it was observed that only 33.7% of their refrigerators had a fixed functional thermometer out of 154 refrigerators seen, and also 27.4% spoilage of stored food observed. Most food handlers 140 (61.4%) use the correct method of cleaning a dirty knife in which they use a detergent and hot water to wash it, thus use

to reduce the chances of food contamination. Clean food contact surfaces are critical to the safety of food and in preventing any form of contamination.

A food surface should be cleaned and sanitized before any food comes into contact with it for the first time and when necessary during or immediately after the handling of food (Moore & Griffit, 2015).

105(45.7%) of the food handlers use a sanitizer and detergent to clean their work-stations. Although, the use of a sanitizer for cleaning their work stations after cleaning them is a good hygiene practice, most of food handlers 125(54.3) did not use the correct method of washing their working stations. According to Ferreira *et al.* (2013) the presence of pathogenic microorganisms in food handlers' hands, makes them an important vehicle of foodborne disease. Therefore, effective hand washing is an essential control measure for food prevention of pathogen transmission in foodservice establishments and the health regulations act stipulate that it is the responsibility of food handlers to wash their hands thoroughly with water and soap under all relevant circumstances (Pilther *et al.*, 2013).

The respondent of performing good food handling practice among food handlers who used three-compartment dishwashing system using detergent and hot water was 162(71.1%) which is inline with the work of (Fasikaw Adbarie Cheko and Zeleke, 2019). 146(63.2%) of the respondents responded that they have shelf or proper container for washed utensil storage. Only 39.9% of the food handlers reported that they wash their chopping boards using detergent and hot water.

One hundred and seventeen (51.3%) of the food handlers were found wearing white gown, Only 62(27%) food handlers were found with covered hair. A similar finding was also reported by (Asrat Meleko¹, Andualem Henok, 2015) shews that About 210(69.5%) of food handlers worn gown during inspection, and half, 160(53%), of them covered hair with restraints. Also, 137(59.6%) of food handlers had finger nail cut short and 106 (46.3%) food handlers were preparing food while they wore finger ornaments. Only 63 (22.7%) food handlers had had medical check ups in the past year.

The previous study conducted by Assefa *et al.* (2015) also reported that 80.4% of food handlers' finger nails were trimmed.

Table 6. Food handling Practice scores of food handlers in Burayu town (N=231 Food handlers).

Food handling practice questioner for food handlers	Response	Frequency	Percent
Does raw food stored on shelf or pallets	No	73	31.6
	Yes	158	68.4
	Total	231	100.0
Do you store raw food and other non food materials separately	No	73	31.6
	Yes	158	68.4
	Total	231	100.0
Do you keep ready- to- eat foods in clean container and covered properly	No	68	29.4
	Yes	163	70.6
	Total	231	100.0
Do you use refrigerator for preservation of food	No	77	33.3
	Yes	154	66.7
	Total	231	100.0
Do you control refrigerator using temperature monitoring chart	No	153	66.5
	Yes	77	33.5
	Total	230	100.0
Do you store food stuff in refrigerator arranged properly	No	104	45.8
	Yes	123	54.2
	Total	227	100.0
Do you store raw and ready to eat food separately	No	75	29.9
	Yes	155	70.1
	Total	230	100.0
Is there any sign of spoilage of stored food observed	No	157	72.6
	Yes	71	27.4
	Total	228	100.0
Do you use detergent and hot water for washing dishes	No	162	71.1
	Yes	66	28.9
	Total	228	100.0
Do you store washed utensil in appropriate container	No	85	36.8
	Yes	146	63.2
	Total	231	100.0
Do you wash chopping board using detergent and hot water	No	137	60.1
	Yes	91	39.9
	Total	228	100.0
Do you wash dirty knives using detergent and hot water	No	88	38.6
	Yes	140	61.4
	Total	228	100.0
Do you clean your work stations using sanitizer and detergent	No	125	54.3
	Yes	105	45.7
	Total	230	100.0
Do you wear white gown	No	111	48.7
	Yes	117	51.3
	Total	228	100.0

Do you wear finger ornaments	No	123	53.7
	Yes	106	46.3
	Total	229	100.0
Do you cut your finger nail short	No	93	40.4
	Yes	137	59.6
	Total	230	100.0
Do you cover your hair at the work place	No	168	73.0
	Yes	62	27.0
	Total	230	100.0
Do you have health examination card	No	169	73.5
	Yes	61	26.5
	Total	230	100.0

Regarding the overall practice score of the food handlers, Table.7 showed that nearly half (51.1%) of the food handlers had good food safety and hygiene practice with score (>50%). This result is compatible with the good level of self-reported hygiene practices in the findings of Abdul-Mutalib *et al.* (2012), Sharif, Obaidat, and Al-Dalalah (2013).

Proper hygiene practices concerning food storage, cleanliness and correct methods of handling food and utensils is the responsibility food handler's.

Table 7 Over all Practice score percent of food handlers (N=231 Food handlers)

Practice score		Frequency	Percent
Poor practice	Practicescore < 50%	113	48.9
Good practice	Practicescore > 50%	118	51.1
Total		231	100.0

Sanitary conditions of food service establishment in Burayu town.

Over all, a total of 164 selected food and drink establishment were assessed. The highest number of studied establishments by type were butchers 87(53.05%), followed by cafeteria 30(18.29%), Milk house 24(14.63%), Juice house 23(14%).

From the establishments assessed in this study, 115(70.1%) of food and drink establishments had a separate food preparation and raw food store room/area and only 65(39.6%) of the establishments had preparation area which has 10% openable windows of floor area with adequate light and ventilation. The majority (78.7%) of the establishments had premises floor with good condition with out any cracks and detached areas. Ceiling status were in good

condition or free of any dust for about 113(68.9%) of the establishments. Nearly half, 183(50.3%) of the establishments had a shelf/pallet but only 142(39.0%) of them handled different items of raw and non-food materials completely separated.

Less than half 74(45.1%) of food and drink establishments covered dust bin for solid waste collection, and infestation of insects were observed in 68(41.5%) of food and drink establishments.

103(62.8%) of establishments had access to privately pipes water running available and 123(75%) of the establishments had a clean water storage during inspection. However, only 55 (33.5%) of them had kitchens with access to running tap water inside the facility for food preparation and available designated sinks for hand washing in their work place, and only 85(51.8%) of the establishments had sinks which were functional during inspection. 90(54.9%) of establishments had different type of detergent available for hand washing.

The majority, 118 (72%) of the establishments had toilet facilities, 111(67.7%) of them had latrine which was clean and free of tissue papers and feces seen around. Only 35(8.6%) of the establishments were found to have a separate units for males and females. 123(75%) of the establishments had toilets which were open for customers at the time of the assessment. Similarly, the study conducted by (Asrat Meleko 2013) showed that most of the latrine facilities were clean and open for use during inspection time. The present study also found out that 95(57.9%) of establishments had septic tank/pit for liquid waste disposal.

Table 8. Sanitary condition of food and drink establishments in Burayu town (N=164 establishments)

Ovservation qustiners for Sanitary condition of establishments	Response	Frequency	Percent
Is there separate room for kitchen, Stuff, Raw food store and food preparation	No	49	29.9
	Yes	115	70.1
	Total	164	100.0
Is the premises floor status in good condition?	No	35	21.3
	Yes	129	78.7
	Total	164	100.0
Is the premise ceiling Status in good condition?	No	51	31.1
	Yes	113	68.9
	Total	164	100.0
Does the premises have openable window 10% of the floor area?	No	74	45.1

	Yes	65	39.6
	Total	139	84.8
Is there covered dust bin?	No	90	54.9
	Yes	74	45.1
	Total	164	100.0
Is there infestation of insect?	No	96	58.5
	Yes	68	41.5
	Total	164	100.0
Is main source of water supply is private pipe?	No	61	37.2
	Yes	103	62.8
	Total	164	100.0
If private, is water running available during inspection?	No	88	53.7
	Yes	76	46.3
	Total	164	100.0
Is water storage clean?	No	41	25.0
	Yes	123	75.0
	Total	164	100.0
Is there toilet facility?	No	46	28.0
	Yes	118	72.0
	Total	164	100.0
Is latrine free of tissue papers and feces seen around?	No	53	32.3
	Yes	111	67.7
	Total	164	100.0
Are there separate latrines for Male and Female?	No	106	64.6
	Yes	58	35.4
	Total	164	100.0
Is toilet facility open at a time of observation?	No	41	25.0
	Yes	123	75.0
	Total	164	100.0
Is there septic tank/pit for liquid waste disposal?	No	69	42.1
	Yes	95	57.9
	Total	164	100.0
Is there designated sinks for hand washing in their work place?	No	109	66.5
	Yes	55	33.5
	Total	164	100.0
Was the hand hand washing setup functional during inspection?	No	79	48.2
	Yes	85	51.8
	Total	164	100.0
Is there any type of detergent available for hand washing?	No	74	45.1
	Yes	90	54.9
	Total	164	100.0

Among assessed food and drink establishments, 32 (19.5 %) of them had green, 37 (22.6%) of them yellow, and 29 (17.7%) of them had red status but the larger proportion, 66 (40.2%) were not complying with the standard. Similarly, the study conducted by (Mulugeta.*et al* 2012) showed that, Only 99 (21.3%) of the establishments studied had good sanitary conditions

Table 9.Over all score of sanitary condition of food and drink establishments in Burayu town (N=164 establishments)

sanitary condition score	Frequency	Percent
Not comply with the standard	66	40.2
Red	29	17.7
Yellow	37	22.6
Green	32	19.5
Total	164	100.0

Correlation analysis between variables (Pearson correlation Bivariate)

Correlation analysis was conducted on main variables in which statistically significant. The knowledge, attitude, and practice total scores of the workers' were calculated by summed up individual answers and the mean score was calculated for each variable. Based on the mean calculated for variables and correlation analysis results, the significant associations between variables were described as follows. There is statistically significant positive correlation between knowledge and age score ($p=0.010$ and $r=0.170^{**}$). It shows that knowledge and age had positive association, which means as increase in age, knowledge is increase by 17%. Similarly educational status and attitude score has significant at $p\text{-value}<0.05$ and positive correlation ($p=0.020$ and $r=0.154^*$) that is, as education increase the attitude of food handlers is increase positively by 15.4%. Other studies relevant to those work was also revealed that as there are statistically significant positive correlation between the study found that personal hygiene practice were significantly associated with age ($\chi^2=14.14$; $p=0.002$), and attitude and practice score ($p=0.001$ and $r=0.559$) (Int J Community Med Public Health. 2019, ASWAWI *et.al*, 2018). In general, knowledge and age, attitude and educational level were found to be weak strength of positive correlation. This shows that, positive correlation between variables i.e. the variable level of participant may be increased at the same time with improvement of the other variable level and vis-versa. Where as statistically significant

divergences was observed between Attitude and marital status ($p = 0.011$ and $r = -0.168^*$) with weak strength of negative correlation (Table 10). This means when a variable of participant increases the other variable becoming decreased without affect one another. On the other hand, the different was insignificant ($p > 0.05$) between some variables such as between attitude score and Gender of participants. Other related study reported that the different was insignificant ($p > 0.05$) between genders in their study, which had investigated food safety knowledge levels of food handlers (Sanlier et al., 2010).

Table 10. Correlation coefficient between significant variables ($p < 0.05$)

Variables	Correlation coefficient (r-value)	P-value
Knowledge and age	0.170**	0.010
Attitude and education	0.154*	0.020
Attitude and marital status	-0.168*	0.011

**Correlation is significant at the 0.01 level (2-tailed), *Correlation is significant at the 0.05 level (2-tailed).

5. Strength and limitations of the study

5.1. Strength of the study

This is the first study to evaluate the status of sanitary condition of food and drink establishments. The data collection was conducted by experienced professionals.

5.2 Limitations of the study

Since only few similar studies were conducted in this topic area, comparison of findings should be seen cautiously in light of subjective measurement of variables and study participant characteristics and methodological differences with other studies.

6. Conclusion

Food safety and hygiene knowledge is very important and helps in the reduction of illness caused due to contamination of food and reduce the chances of foodborne disease outbreaks. Our study indicated that most food handlers have good knowledge and attitude towards food hygiene and safety handling practice.

Based on our findings, regarding knowledge level, overall, food handlers have good knowledge about hygiene and safety requirements. Specifically, almost more than 70% of food handlers knew the fact that hand washing practices before work can reduce risk of food contamination. But in most of other hygiene and safety requirements, food handlers had low understanding. Though most of the food handlers knew the importance of hand washing practices, practically they were not complying and this requires managers to promote the delivery of continuous training to the staff members on hygiene and safety practices.

Though it was not with the same extent to the knowledge level, overall, more than half of the participants had good level of attitude towards food hygiene and safety practice. Most of them have also good attitude for each of the attitude assessing parameters they were asked. Likewise, attitude of participants towards certain food hygiene and safety requirements were relatively low (only less than half of the participants 77(33.3%) agreed that raw foods should be kept separately from cooked foods).

With regard to sanitary condition issues of the establishments, the study found out that their overall level of food and drink establishments was poor. The larger proportion, 66 (40.2%) of food and drink establishments were not complying with the standard and also, 29(17.7%) of the food and drink establishments were at red status.

The present study also pointed out that, although the knowledge, attitude and practices of food handlers were good, poor sanitary condition was observed including absence of designated sinks for hand washing in their work station, clean water supply and separate latrine for male and female.

7. Recommendations

Based on our findings, the following important issues are recommended:

For Burayu town Food, Medicine and Health Care Administration and Control Authority

- Formulate action plans to create our awareness on regulatory hygiene and safety requirements.
- Strict implementation of food hygiene and sanitation regulatory requirements and directives.
- Preventive measures after awareness and announcement

For food and drink establishments

- Facilitate training opportunity on main gaps of hygiene and sanitation requirements
- Food handlers and establishments' managers should be aware of their role and responsibility in protecting the food from contamination.
- Always check and monitor the implementation of requirements and their policy.

For researchers

- Further studies should be conducted to assess knowledge, attitude, practice of food handlers and sanitary condition of food and drink establishments, especially on trend of food handling practice and related factors.

8. Reference

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8. ANNEXES

Annex 1: Participant's Information

Hello, my name isand I am going to conduct an interview with you on behalf of Mr. Mamo Bekele postgraduate student at Addis Ababa University, school of pharmacy. He is now conducting a research entitled to assess knowledge and practice of food safety among food handlers and sanitary condition of food service establishments in Burayu town.-Ethiopia. The purpose of this interview is to conduct scientific research that may help us to identify problems of the program and forward some recommendation to concerned bodies that will help to improve the existing efforts. You may not get additional benefits if you volunteered for the study. I have received permission from the Burayu town administration health office, to conduct this study. The interview will just take a few minutes. Your responses will help the implementers to better understand the current situation of knowledge of food handler and associated factors in food and drink establishments. Your answers will be completely confidential, and if at any time during the interview you want to stop answering questions, you are free to do so. If you are willing to participate, you will be requested to provide written informed consent before the interview. If you have any questions or if something is not clear please feel free to ask. You can contact the investigator and/or the advisor and ask any question you have at any time.

Investigator's name and address:

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Advisor's name and Address:

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Annex 2: Consent form

Hello! My name is We are interviewing with food handlers who had direct involved in food handling practices in food and drink establishments. The objective of this study is to assess knowledge and practice of food safety among food handlers and sanitary condition of food service establishments in Burayu town - Ethiopia.

We will ask you questions which will take 15-20 minutes of your time. Your answers to these questions will remain confidential. Your name will not be written on questionnaire. You have the

rights to withdraw from the study at any stage or to restrict the information you provide from being used as a part of the data analysis. There is no anticipated risk except time consumption with expected benefits.

Confidentiality: - Any information forwarded will be kept private and his/her name will not specified

Do you agree to participate in the study?

A. Yes ----- continue with the interview

B. No ----- go to the next case or control

Thank you for being voluntary to participate in the study.

I have been briefly informed about the study and I clearly understood the objective. Therefore, I hereby approve my consent to take part in the study as an interview with my signature.

Identification number of respondent's-----Signature_____ Date_____

Annex 3: የተሳታፊዎች የመረጃ ቅጽ

አዱስ አበባ ዩኒቨርሲቲ፣ጤና ሳይንስ ኮሌጅ ፣የሕብረተሰብ ፋርማሲ ትምህርት ክፍሌ ይህ መጠይቅ በቡራዩ ከተማ ውስጥ በሚገኙ በተመረጡ የምግብና መጠጥ ዴርጅቶች አጠቃላይ የንጽህና ሁኔታ ጋር በተያያዘ የሚደረግ ጥናት የተዘጋጀ መጠይቅ ነው።

የተሳታፊዎች የመረጃ ቅጽ
የፕሮጀክቱ ርዕስ: የምግብና መጠጥ ዴርጅቶች አጠቃላይ የንጽህና ሁኔታ ዲሰሳ

ጥናቱን የሚያካሂደው ግለሰብ: ማሞ በቀለ
አማካሪ: ድ/ር አይናድስ ታማነ

ማስተባበሪያ ቢሮ: በአዱስ አበባ ዩኒቨርሲቲ የሶሻል ፋርማሲ ት/ቤት
ዓላማ: የምግብና መጠጥ ዴርጅቶችን አጠቃላይ የንጽህና ሁኔታና የምግብ አዘጋጆች የነጻህና እና የመግብ ደኤንነትና አያያዝ ወንታን በማጥናት የዳህረ-ምረቃ ትምህርት ማሟያነት ለመጠቀም ነው።
አካሄዳዊ ተሳትፎ: ከዘሀ በ መቀጠሌ ከምግብና መጠጥ ዴርጅቶች አጠቃላይ የንጽህና ሁኔታ ጋር በተያያዘ ጥያቄዎችን ለቀርብሎት እወዳለሁ። ከእርስዎ የሚገኘው መሌስ በሀገራችን ለሚገኙ የምግብና መጠጥ ዴርጅቶች ንጽህናው የተሟላ አገልግልት አቅርቦት ለማሻሻሌ ከፍተኛ እገዛ ይኖረዋል።ጥናቱ ውጤታማ ሊሆን የሚችለው እርስዎ በሚሰጡት ትክክለኛ መሌስ በመሆኑ ጥያቄዎቹን በጥንቃቄ እንዲመልሱልኝ ፍቃደኛነትዎን በትህትና እጠይቃለሁ።

ሚስጥራዊነት፡- ከእርስዎ የምናገኛቸውን ማንኛውንም መልሶች በሚስጥር እንጠብቃለን። ከዚህ ጥናት ጋር በተያያዘ በማናቸውም ቦታና ጊዜ ስምዎ እንደማይፀናና እንደማይጠቀስ ልንገልጽሎዎ እንወዳለን። ጥቅም፡ ይህ ጥናት የአጭር ጊዜ የገንዘብ፣ የጤና እንክብካቤ እና የአቅም ግንባታ ጥቅማ ጥቅሞች ለተሳታፊዎች የለውም።

ነገር ግን በሂደት የጥናቱ ውጤት ለሚመለከተው አካልና ፖሊሲ አውጪዎች ለፖሊሲ ግብአትነት፣ አቅጣጫ እና ስትራቴጂ ቀረፃ ይረዳል። በይበልጥ ጥናቱ በመስኩ እንደ መነሻ መረጃ ሆኖ ያገለግላል።

ጉዳት፡- ሊካሄዱ የታሰበው ጥናት በተሳታፊዎች ላይ ኢሰብአዊ የሆነ አቀራረብ፣ አካላዊ ጉዳት፣ ማህበራዊ ችግርን፣ ስነሌቦናዊ ጉዳትና የኢኮኖሚ ዲቀትን አያስከትልም።

ጉባዔ፡ ማበረታቻ እና ካሳ፡- ይህ ጥናት ምንም አይነት ማበረታቻና ካሳ የለውም። በተጨማሪም ምንም አይነት ካሳ የሚያስከፍል ጉዳት አያመጣም።

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

የማቋረጥ ነፃነት፡ በጥናቱ ለመሳተፍ ፍቃደኛ ሆነው ከጀመሩ በኋላ በማናቸውም ሰዓት ጥናቱን ሊያቋርጡ ይችላሉ። ለዝህም ማንም ሰው ያቋረጡበትን ምክንያት እንዲያብራሩ ልያስገድዱ አይችሉም።

መገናኛት የሚችሉት ሰው አዴራሻ፡- የጥናቱ ተሳታፊ ስለጥናቱ ሁኔታ እና ይዘት ግልጽ ካልሆነለት በማናቸውም ሰዓት መረጃ የመጠየቅ መብት አለው። ዋና አጥኚውን እና አማካሪውን ማግኘት ይችላሉ። ለበለጠ መረጃ እና ስለፕሮጀክቱ ማረጋገጥ የሚፈልጉት ነገር ካለ በሚከተለው አዴራሻ መጠቀም ይችላሉ ። ዋና አጥኚ፡ ማሞ በቀለ ስሌክ፡ 0911394729

አማካሪ፡ ድ/ር አይናድስ ታሙን አዱስ አበባ ዩኒቨርሲቲ ጤና ሳይንስ ኮሌጅ የምግብ ሳይንስ ት/ቤት ሞባይሌ፡ +251912062604.

Annex 4: የፍቃደኝነት መጠየቂያ ፎርም

የፕሮጀክቱ ርዕስ፡- የምግብና መጠጥ ዳርጅቶች አጠቃላይ የንጽህና ሁኔታ ዲሰሳ ይህ ጥናት በአዱስ አበባ ዩኒቨርሲቲ የሶሻል ፋርማሲ ት/ቤት አስተባባሪነትና ዴጋፍ በተማሪ ማሞ በቀለ ለዲህረ-ምረቃ ፕሮግራም ማሟያነት እንደሚካሄዱ አውቃለሁ። በሚገባኝና በማውቀው ቋንቋ ስለ ፕሮጀክቱ ዓላማ በአግባቡ ተገልጿል።

ዋና አጥኚ፡- ማሞ በቀለ ስሌክ፡ 0911394729

አማካሪ፡- ድ/ር አይናድስ ታሙን አዱስ አበባ ዩኒቨርሲቲ ጤና ሳይንስ ኮሌጅ የምግብ እንጂነርንግ ት/ቤት ሞባይሌ፡ 0912062604፣

እኔ ለጠየቁው የምሰጣቸው መረጃዎች ሚስጥራዊነት እንደሚጠበቅ፣ በማናቸውም ሰዓት ቃለ መጠይቁን ማቋረጥ፣ ጥያቄዎችን መጠቅ እንደምችል እና ጥናቱም ምንም ዓይነት ጉዳት እንደማያስከትል፣ ጥቅማ ጥቅምም ሆነ ካሳ እንደሌለው ተረዳቻለሁ። በተጨማሪም በማናቸውም ሰዓት በጥናቱ ዙሪያ ግልጽ ያልሆኑልኝ ነገሮችን የመጠየቅ ሙሉ መብት እንዳለኝ ተረጋግጧል። ይህ የፍቃደኝነት መጠየቂያ ቅጽ ከላይ በውስጡ ስለያዘቸው ጉዳዮች በማውቀው/በምረዳው ቋንቋ አንብቤ/ተነበልኝ በጥናቱ ለመሳተፍ ፍቃደኝነቴን በቅጹ ላይ በመፈረም ተስማምቻለሁ።

የተሳታፊው ስም -----

በጥናቱ ለመሳተፍ ተስማምቼያለሁ፡ አዎ/አይ (በቃሌ ለመስማማት በመረጡት ላይ ምልክት ያደርጉ) ፈርማ ----- (የጽሁፍ ፍቃደኝነት መግለጫ ከሆነ)

የእመኝ ሥም ----- (መረጃ ሰብሳቢ፣ ተቆጣጣሪ፣ ወይም ማንኛውም ሦስተኛ ሰው)
 ፊርማ -----
 ቀን -----

Annex 5 Amharic version questionnaires to interview food handlers of food and drink establishments for socio-demographic information, knowledge, practice and attitude.

አጠቃላይ መመሪያ

አብዚኛዎቹ ጥያቄዎች የመሌስ መለያ/ኮዴ የተሰጣቸው ናቸው። በመሆኑም መልሱን/ተጠያቂውን በሚጠይቁበትና ምላሹን

በሚመዘገቡበት ጊዜ የሚከተሉትን መመሪያዎች ይከተሉ።

- እያንዳንዱን ጥያቄ በትክክል በመጠይቁ ልይ በተጻፈው መሰረት ይጠይቁ።
- በመጠይቁ ልይ የተቀመጡትን በቅዴሚያ መለያ/ኮዴ የተሰጣቸውን ምላሾች ለመለሹ/ተጠያቂው አያንብቡ። የተጠያቂውን ምላሽ ብቻ ያዲምጡ።
- ለተጠያቂው ምላሽ በመልስ ዝርዝሮቹ ውስጥ ካሉት አማራጮች ተቀራራቢ የሆኑ ምርጫዎችን ያክቡ።
- የተጠያቂውን መሌስ በመይፈልጉ ጥያቄዎች ላይ አካላዊ ምሌክታ በማድረግ መሌሶችን ይሙሉ።

1. የምግብና መጠጥ ቤት ሰራተኞች ማህበራዊና ስነ-ህዚባዊ መረጃዎችና ተያያዥ ሁኔታዎች የምዳስስ የተዘጋጀ ጥያቄ			
ተ.ቁ	ጥያቄ	መልስ	መለያ
101	ጾታ	1. ወንድ 2. ሴት	
102	ዕድሜ	1. ከ18 ዓመት በታች 2. 18-30 3. 31-42 4. 43-54 5. >55	
103	ሃይማኖት	1. ኪርስታን 2. ሙሴልም 3. ሌላ ይገለጥ-----	
104	የጋብቻ ሁኔታ	1. ያላገባ 2. ያገባ 3. የተፋታ 4. የሞተበት 5. የተለያዩ	
105	የአገልግሎት ዘመን	<1 ዓመት 2. 1-6 ዓመት 3. 6-10 ዓመት 4. ከ10 ዓመት በላይ	
106	የትምህርት ደረጃ	1. ያልተማረ 2. 1-6 ክፍል 3. 7-12 ክፍል 4. ከ 12ኛ ክፍል በላይ	
107	ቻንቻ?	1 አፋን ሆሮሞ? 2 .አማርኛ...3 ለላ ይገለጽ -----	
108	በምግብ ደንበኞች አያያዥ ላይ ስልጠና ወስደዋል	1፣አዎ 2፣አልወሰድኩም	
109	ወራዊ ገቢ?	1. <1000 ብር 2. 1001-2000 3. 2001-2500 4. 2501-3500 5. 3500	

ስለ ምግብ አያያዥና አካባቢ ንጽና አጠባበቅን የምመለከት ጥያቄ. (physical condtion)

A ስለ ምግብ አያያዥና አካባቢ ንጽና አጠባበቅን የምመለከት ጥያቄ	መለያ
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ተ.ቁ	ጥያቄ	መልስ	የምግብ ማዘጋጃ ክፍል ምልሽ መለያ ከድ					የዳቦ/ከ ክመጋ ርዕዮተኛ ል
			የጥረ ዕቃ መጋዘን	ምግብ ማዘጋጃ ክፍል	መመገብያ ክፍል	የሰራተኞች ልብስ መቀየርያ ክፍል	የስጋማቀነባበር ያክፍል	
201	የምግብ ማዘጋጃ ክፍል ለብቻ አለ?	1.አለ 2.የለም						
202	የቤቱ ወለል አያያዝና ንጽናው በጥሩ ውነታ ላይ እገኛል ?	1.አዎ 2.አይደለም						
203	የቤቱ ኮርንሱ አያያዝና ንጽናው በጥሩ ውነታ ላይ እገኛል ?	1.አዎ 2.አይደለም						
204	የወለሉን 10 ፐርሰንት የምሆን ተከፋችሁሰኩት አለ ወይ?	1.አለ 2..የለም						
205	ክዳን ያለው የደረቅ ቆሻሻ መጥያ አለወይ?	1.አለ 2..የለም						
206	ነፍሳት አለ ወይ?	1.አለ 2..የለም						

s.n	ጥያቄ	መልስ	መለያ
207	የምትጠቀሙበት ውሃ የግለሽ ባንባ ነው?	1.አዎ 2.አይደለም	
208	የግል ከሆነ በቁጥጥር ወቅት ውሃ አለ ወይ?	1. አለ 2.የለም	
209	የውሃ ማጠራቀምያ ንጽህ ነው	1.አዎ 2.አይደለም	
210	መጻፍጃ ቤት አለ;	1.አለ 2.የለም	
211	መጻፍጃ ቤቱ ከጠለያዩ ቆሻሻዎችና ከሽንት የጸዳ ነው	1. አዎ 2. አይደለም	
212	ለሴትና ለወንድ የተለየ መጻፍጃ ቤት አለ;	1. አለ 2. የለም	
213	በጉብኝት ወቅት መጻፍጃ ቤቱ ለአገልግሎት ክፍት ነው?	1. አዎ 2. አይደለም	
214	ከመጻፍጃ ቤትና ከዕቃ ማጠባያ የምወጣ ፈሳሽ ቆሻሻ ማጠራቀምያ ጉድጋድ አለ	1. አለ 2. የለም	
215	ለሰራተኞች የተለየ የእጅ መታጠቢያ ስንክ አለ	1.አለ 2.የለም	
216	በጉብኝት ወቅት የእጅ መታጠቢያ እሰራል?	1.አዎ 2.አይሰራም	
217	በጉብኝቱ ወቅት የእጅ መታጠቢያ ሳሙና አለ?	1.አለ 2.የለም	

3. በምግብና ማጠጥ ቤት ውስጥ የምግብና የምግብ ዕቃ ንርህና አያያዝ (practice) ውነታን የምመለከት

ተ.ቁ	ጥያቄ	መልስ	መለያ
301	የምግብ ጥረ ዕቃ የተከማቸበት ሽልፍ ወይም ፖለት ላይ ነው?	1.አዎ 2.አይሰራም	
302	የምግብ ጥረ እቃና ለሎች የምግብ እቃያልሆ እቃዎች አካላት ተለያይተው ነው?	1.አዎ 2.አይሰራም	
303	የተዘጋጀ ምግብ በትክክል የተከደነና ንጽህናው የተጠበቀ ነው?	1. አዎ 2. አይደለም	
304	ለምግብ ማቆያ የምያገለግል ፍርጅ አለ?	1. አለ 2. የለም (መልሱ የለም ከሆነ ወደ410ይላፍ)	
305	ፍርጁ የምሰራ የቅዝቃዛ መጠን መለኪያ ገጅ አለው?	1.አለው 2.የለውም	
306	ምግብ በትክክል ፈረጅ ውስጥ ተቀምጠዋል?	1. አዎ 2. አይደለም	
307	የተዘጋጀ ምግብና ጥረ ምግብ አንድላይ ተቀምጠዋል?	1.አዎ 2.አይደለም	

308	የመበላሸት ምልክት የምያሳይ ሽታ ያለው አለ?	1.አዎ 2.አይደለም	
309	ድስት ለማጠብ የማጠብያ ከምክልና ሙቅ ውሃ እጠቀማለሁ?	1. አዎ 2. የለም	
310	ለታጠበ የምግብ ዕቃ ማስቀመጫ አለሁ	1. አዎ 2.የለም	
311	የምግብ አዘጋጅ አመክንፍያን የማጠብያ ከምክልና ሙቅ ውሃ እጠቀማለሁ?	1.አዎ 2.የለም	
312	የምግብ አዘጋጅ የቆሽሽን ብላ በሰሙናና በሙቅ ውሃ ያጥባሉ?	1. አዎ 2. የለም	
313	የምግብ አዘጋጅ የስራ በታችውን በከምክልና ሙቅ ውሃ ያጥባሉ?	1.አዎ 2. የለም	
314	የምግብ አዘጋጅ ነጭ የስራ ልብስ እለብሳለሁ	1.አዎ 2. የለም	
315	ምግብ አዘጋጅ የጣት ገጣጥ አድርገዋል?	1. አዎ 2.የለም	
316	የምግብ አዘጋጅ ጥፍር ተቆርጧል?	1.አዎ 2.የለም	
317	የምግብ አዘጋጅ ፀጉር የተሸፈነ ነው?	1.አዎ 2.የለም	
318	ምግብ አዘጋጅ የጤና ምርመራ አላቸው?	1.አዎ 2.የለም	

4. የምግብ አዘጋጅ ስለ ምግብ ደንበትና አይደዘ ላይ ያላቸውን ግንዛቤ የምመለከት ጥያቄ

ተ.ቁ	ጥያቄ	መልስ	መለያ
401	ምግብ አዘጋጅ የምግብ ብክለትን ለመከላከል ሊበላ የተዘጋጀውን ምግብ በባይ እጃቸው ከመንካት መቆጠብ አለባቸው.	1.አዎ 2.የለም	
402	የምግብ ብክለትን መከላከል የምቻለው የምግብ ማዘጋጃ ክፍል ወለል ና ግርግዳውን ንጽህናንም በመጠበቅ ነው.	1.አዎ 2.የለም	
403	ምግብ አዘጋጅ የምግብ ብክለትን መከላከል የምችሉት ትኩሱን ምግብ እንደ ትኩስነቱ ቀዝቃዛውን እንደቀዝቃዛነቱ መያዝ ስችሉ ነው.	1.አዎ 2.የለም	
404	የምግብ አዘጋጅ ምግብ ማዘጋጃ ት ከመጀመራቸው በፊት እጃቸውን መታጠብ አለባቸው	1.አዎ 2.የለም	
405	አይጅን በምግብ ምክንያት ልመጣ የምችለውን በሽታ እከላከላለሁ	1.አዎ 2.የለም	
406	መታጠብ ብክለትን ያስወግዳል ሳንታይዝን ግን ጀረምን ያጠፋል	1.አዎ 2.የለም	
407	ምግብ አዘጋጅ በምግብ ማዘጋጃ ወቅት ገላቸውን ከመንካት መቆጠብ አለባቸው	1.አዎ 2.የለም	
408	ሳንታይዝርን መጠቀምና የእጅ ጋንት ማድረግ መታጠብን እተካል	1.አዎ 2.የለም	
409	ምግብ አዘጋጅ በምግብ ዝግጅት ወቅት የእጅ አምባር፣ የጋብቻቀለበትና ገጣጥ ማድረግ ክልክል ነው	1.አዎ 2.የለም	
410	አትክልትና ፊራፊረ ባዘጋጀው እጅ ሲጋ ብናዘጋጅ ችግር የለውም	1.አዎ 2.የለም	

5. የምግብ አዘጋጅ ስለምግብ ደንበት ያላቸውን አመለካከት የምያሳይ

ተ.ቁ	ጥያቄ	መልስ				
		በጣም አል ስማማም	አልስማማም	እርግጠኛ አይለውም	እስማማለሁ	በጣም እስማማለሁ
501	በትክክል የምግብ ደንበትን መጠበቅ የእነ ድርሻነው					
502	በከፍተኛ ደረጃ የግልን ጽህፍት መጠበቅ አስፈላጊ ነው ብዬ አስባለሁ					
503	እጅን በትክክል መታጠብ ምግብ ወለድ በሽታን እከላከላለሁ					
504	ጋንት ከማድረግ በፊት እጅን እታጠባለሁ					

505	የተዘጋጀን ምግብ ለመያዘው ጋንት ማድረግ ብክለትን ስጋት እቅንሳል				
506	ስለ ምግብ አይጂንና አያያዝ ስልጠና ለምግብ አዘጋጅ ሙስጠት የምግብ ብክለትን ስጋት ለመቀነስ በጣም እጠቅማል				
507	የበሰለ ምግብ ከጥረ ምግብ ተለይተው መቆመጥ አለበት				
508	በትክክል የበሰለ ምግብ ከብክለት የጸዳ ነው				
509	የፍርጅን የቅዝቃዛ መጠን በየግዛው መከታተል በትክክል ስለመስራቱን ለማረጋገጥ እጠቅማል				
510	በምግብ ወለድ በሽታ ከታመሙኩ ፍቃድ እወስዳለው እንጅ ስራውን አልሰራም				

English version questionnaires to interview food handlers of food and drink establishments for socio-demographic information, knowledge, practice, attitude and sanitary condition assessment.

General instruction for the interviewers

Almost all questions will be 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 manager and food handlers of establishments			
s.n	Questions	Responses	Code
101	Sex	1. Male 2.Female	
102	Age: in years	1.<18 year 2.18-30years 3.31-42 4.43-54 5.>55	
103	Religion	1. Christian 2. Muslim 3.Other, specify-----	
104	Marital status	1. Single 2. Married 3. Divorced 4. Widowed 5.Separated	
105	Service year of food handler	1.<1year 2.1-6 3. 7-12 4.13+	

106	Educational status	1. Not educated 2. Grade 1-6 3. Grade 7-12 4. Above grade 12	
107	Language?	1 Oromo language? 2 .Amahriclang...3 other-----	
108	Food hygiene Training received	1. Yes 2.No	
109	Monthly income?	1.<1000birr 2.1000-2000 3.2000-2500 4.2500-3500 5.> 3500	

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

2.Obsarvetion Physical stutes of premises rooms and Sanitary Facilities of establishments.								
s.n	Questions	Response	Response Codes of kitchen					
				Preparati on	Servin g dinnin	Roo ms	Butcher s	Bakery
201	Is there separate room for kitchen, Stuff, Raw food store and food preparation.	1.Yes 2.No	(----	(-----)	(-----)	(----- -)	(-----)	(-----)
202	Is Premises Floor Status in good condition	1. Yes 2. No	(----	(-----)	(-----)	(----- -)	(-----)	(-----)
203	Is Premises ceiling Status in good condtition	1.Yes 2.No	(----	(-----)	(-----)	(----- -)	(-----)	(-----)
204	Does the Premises have open able window? (10% floor area)	1.Yes 2.No	(----	(-----)	(-----)	(----- -)	(-----)	(-----)
205	Is there covered dustbin in?	1. Yes 2.No	/	/	/	/	/	/
206	Is there infestation of insect?	1. Yes 2.no	/__	/__	/__	/__	/__	/__

s.n	Question	Response	Code
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207	Is the main source of water supply Private Pipe?	1. Yes 2. No	
208	If private is water running available during inspection?	1. Yes 2. No	
209	Is water storage Clean	1.Yes 2.No	
210	Is there toilet facility	1.Yes 2.No	
211	Is latrine free of litter, tissue papers and other dirt's like feces/urine seen around	1. Yes 2. No	
212	Separate latrine for male and Female	1. Yes 2. No	
213	Is toilet facility open to give service at time of observation?	1. Yes 2. No	
214	Is septic tank/pit for liquid waste disposal?	1. Yes 2.No	
215	Is available designated sinks for hand washing in their work place	1. Yes 2. No	
216	Is the hand washing functional during inspection?	1.Yes 2.No	
217	Is there any type of detergent available for hand washing?	1.Yes 2.No	

Handling practice and cleanliness of utensils and equipment's in food premises

s.n	Question	Response	Code
301	Dase raw food stored on shelf or pallets?	1. Yes 2. No	
302	Dase raw food and other non-food materials stored separetly?	1.Yes 2.No	
303	Do ready to eat foods kept in clean container and covered properly?	1. Yes 2. No	
304	Is a refrigerator available for preservation of food?	1. Yes 2. No (If No skip to 409)	
305	Does refrigerator have a fixed functional thermometer?	1.Yes 2.No	
306	Did the foodstuff stored in refrigerator arranged properly?	1.Yes 2.No	
307	Did raw and ready to it food stored together?	1.Yes 2.No	
308	Is there any sign of spoilage of Stored food observed?	1.Yes 2.No	
309	Do you use deteregent and hot water for washing dishes?	1. Yes 2. No	

310	Is ther container foor washed utensil storage	1. Yes 2.No	
311	Do you wash chopping board using detergent and hot water	1. Yes 2.No	
312	Do you wash dirty knives using detergent and hot water	1. Yes 2. No	
313	Do you clean your work stations using sanitizer and detergent	1.Yes 2.No	
314	Do you wear white gown ?	1. Yes 2.No	
315	Do you wear finger Ornaments?	1. Yes 2.No	
316	Do you cut your Finger nail short?	1. Yes 2.No	
317	Do you cover your hair at the work place	1. Yes 2.No	
318	Is there Food handlers health examination card	1.Yes 2.No	

Knowledge of food handlers

No.	Question	Response	Cod
401	Food handlers can control contamination by performing and avoid touching ready prepared food with bare hands	1.No 2.Yes	
402	Food handlers can control contamination by Keeping the floor and walls of the room clean	1.No 2.Yes	
403	Food handlers can control contamination by washing their handes and Keeping hot food hot and cool food cool	1.No 2.Yes	
404	Arm ring and Wedding Band jewelers are not allowed to wear in the kitchen	1.No 2.Yes	
405	Hand sanitizer and tissue paper gloves can Substitutes for hand Washing	1.No 2.Yes	
406	Food handlers should avoid touching their body during food preparation	1.No 2.Yes	
407	Washing removes contamination and sanitizing destroys microorganisms	1.No 2.Yes	
408	Food handlers should wash their hands before handling food	.No 2.Yes	
409	Hygiene is important to Prevent illness through food	1.No 2.Yes	
410	The same gloves used when handling fruits can also be used to handle meat	1.No 2.Yes	

Food handlers' attitude towards food safety

No	Statement (Question)	Answers				
		Strongly dis agree	disagree	Uncertain	agree	Strongly agree
501	Properly food handling is an essential part of my responsibility at work					
502	I think that it is good to maintain a high degree of personal cleanliness while working					
503	Cleaning my hands effectively can prevent foodborne diseases					
504	I should wash my hands before putting gloves					
505	The use of gloves could reduce the contamination risk while handling ready-to-eat foods					
506	Food hygiene training for handlers is an important issue to reduce the risk of food contamination					
507	Raw foods should be kept separately from cooked foods					
508	Well-cooked foods are free from contamination					
509	It is necessary to check the temperature of refrigerators/ freezers periodically to ensure it if functioning properly					
510	I should take leave and should not work on the food premises if I am suffering from foodborne illness					

Waliigalt.1(annex-4) Afaan Oromoo version questioner
Waliigaltee gaafii:-

Nagaa jirtuu? Ani maqaan koo-----jedhama qoranno wa'e mana kenniinsa tajaajila nyata fi dhugatii ilaalchise magaalaa Burayuu keesati gageesa jirra.

Kaayyoon qoranno kanaa akkata beekumsafi qabiinsaa qulqulina nyaata hojetoota mana keeniinsa tajaajila nyaata fi dhugati Magaala Burayuu keessa jiranii hubachu dhafi dha.

Qorannon kun Magaalaa Burayyu keesati kan gaggeefamu yommu ta'u gaafii fi deebii kanaf yeroon fudhatu daqiiqa 15-20 qofaa dha.

Gaafii kana yeroo deebistan maqaan keesan hin barrefamu iciitiin keesanis ni eegama. Gaafii kana deebisuu keesaniif wanti argaatanis hin jiru yoo diddanis waantaatan hin qabdan. Gaafilee kana keesa kan deebisu hin barbaane yoo qabaattanis dhiisun mirga keesan.

Gaafii kanaf yoo fdha qabatan-----itt fufna

Yoo fedha hin qabaane-----garaitti anuti darba

Lakkobsa adda baastu-----mallato-----guyyaa-----

Gaafilee verstion Afaan Oromoo

Kutaa 1:-waliti dhufenya fi hubano uummataa hojjetaan dhuunfan qabu.

Waliti dhufenya fi hubano uumata			
Lakko	Gaaffii	Deebii	Koodi
101	Saala	1.dhira 2. Dubara	
102	Umuriin kee waggaa meeqa?	1.Wagga 18 gad 2 18-30 3.31-42 4.43-54 5.>55	
103	Amanta	1.musilima 2.kiristana 3.karbira-----	
104	Aali ga'ela kee attamii?	1.kan hinfudhin/hin erumin 2.kanfudhe/erume 3.kan du'e 4.kaniike	
105	Waggan tajaajila kee meeqa?	1.Waggaa 1 gadi 2. 1-6 3.7-12 4.13+	
106	sadarkaan barnota kee meeqa?	1.hin barane 2.1-6 3.7-12 4.12 oll	
107	Afaan dhaloota kee malii?	1. Afaan Oromoo 2.Afaan Amaaraa 3,karbira ibsaa-----	
108	Sabumman kee maalii?	1 Etiopia 2.Amerikaa 3. Engiliiz 4 kanbera ibss-----	
109	Gaaliin ji'an ati kana'irra argatu meeqa?	1.Qarshii 1000 gadi 2.1000-2000 3.2000-2500 4.2500- 3500 5.>3500	

Annex-2 Gaaffii aala eegumsa naannoo fi .HaalaTajaajila eegumsa qulqulinaf qabiinsa nyata. (Physical condtion)

Haala qabiinsa fi qulqulina mana nyataa fi dhugati								
Lakko	Gaaffii	Deebii	Koodii deebii mana qophesaa nyataa					
			Kusaa nyata dhedhi	Kushina	Baka itnyatan	kutahojetoota	Kuta foni	Kutadabo /keki
201	Manni nyaanni itti qopha'u qofati jira?	1.eyye 2.miti						

202	Walaliin(lafti) manichaa qulqulu dhaa?	1. eyye 2.miti						
203	Kornisiin iasaa qulqulu dhaa?	1.dhoqa 2.baaqaa 3.urata 4.gaaridha						
204	Foddaa kan banamu kan(10%)walalii ta'u qabaa?	1.eyye 2..miti						
205	Kuusa balfa goga kan keddo qabu qabaa?	1.eyye 2..miti						
206	Elbisoni nijiru?	1.eyye 2..miti						

Lakko	Gaffii	Deebbii	Kooddii
207	Maddi bishan keesaani eessa?	1.bamba nama dhunfa 2.bamba qodamu 3.hollarra 4.bonora	
208	Yerosanati bishan ya'a jira?	1. Eye 2.no	
209	Kuusan bishani Qulqulu dhaa ?	1.eyye 2 miti	
210	Mani fincani jira?	1.eyye 2.miti	
211	Mani fincanii qulqulu dha?	1.eyye 2.miti	
212	Mani fincani dhirafi Dubaraf adda ba'a dha?	1.eyye 2. Miti	
213	Yero santi maani fincani bana dha?	1.eyye 2.miti	
214	Balfan dhangala'a kan itti kuufamu booli jiraa?	1.eyye 2 miti	
215	Yerosanati bishan dhiqata arkaaf jiraa?	1.eyye 2.miti	
216	Yoo gaffin 310ffa eye ta'e kan hojetafi kan tajajilama adda baa'a dha?	1eyye 2.miti	
217	Samunaan dhiqata jiraa?	1.eyye 2.miti	
218	Balffaan gogaan kan itti kuufamu jiraa?	1.eyye 2.miti	

3. Qabinsa (practice) qulqulina meeshalee fi qodaa nyaata mana nyaata fi dhugati..

Lakko	Gaaffi	Deebi	Koodi
301	Kuusan mesha nyaata dheedhi fi bilchataa add aba'eraa	1.eyye 2miti	
302	kuusanMidhan nyata dhedhi fi garbiro add aba'eraa?	1.eyye 2miti	
303	Qabaneesan nijira?	1.eyye 2.miti	
304	Qabanesan lakoftuu temprechera qabaa?	1.eyye 2.miti	
305	Nyaani sirratee qabanesa keesa ta'era?	1.eyye 2.miti	
306	Nyani bilchata fi dheedhin waliin jira?	1.eyye 2.miti	
307	Wanti foli ajaa qabu jira?	1.eyye 2.miti	
308	Siinki boolla sadii qabu jiraaq?	1.eyye 2miti	
309	Distii miicuuf bishan ho'a qabuu?	1.eyye 2.miti	
310	Meshaa qulquleesituu (detergent) qabu?	1.eyye 2.miti	
311	Bakka qoda nyata miicame ka'an qabu?	1.eyye 2.miti	
312	Makatafaan qulquldha?	1.eyye 2.miti	
313	Billan qabiinsi isaa fi qulqulini isaa ni eegama?	1.eyye 2.miti	
314	Hojetonni billa xura'e Bishan buluqafi saamunaan miicuu?	1,eye 2. miti	
315	Hojetonni bakka hojii isanii samuna fi sanitaizeriin qulqulesuu?	1.seyye 2.miti	
316	Hojetoni Hufata hoji hufatani jiruu?	1.eyye 2.miti	
317	Hojetonni qobi mata godhatani jiruu?	1.eyye 2.miti	
318	Hojetonni faayaa qubaa (qubela) godhatuu?	1.eyye 2.miti	
319	Hojetoni qeensa qorataniruu?	1.eyye 2.miti	

320	Waraqaa qorano fayya qabuu?	1.eyye 2.miti	
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5. Gaaffii wa'ee beekumsa hojetoota ilaalu

Lako..	Gaaffii	Deebii	Coodii
401	Hojetoni Faalama nyataa dhorkuuf Qulqulina manicha eeguunqabu	1.eyye 2.miti	
402	Hojetoni Faalama nyataa dhorkuuf nyaata qopha'e arkaan tuqu dhiisun qabu	1.eyye 2.miti	
403	Hojetoni Faalama nyataa dhorkuuf isa ho'aa akkuma ho'eti isa diilala'a akkumu dilila.etti dhiisun	1.eyye 2.miti	
404	Hojjetoonna nyata qophesun dura arkadhiqatuu?	1.eyye 2.miti	
405	Hojetonna nyata yoo arka hin dhiqatii snitayizeri fi gu'antii fayadamu qabu	1. eyye 2.miti	
406	Hojetonna nnyataa Yero qopesanqaama isanii tuqu hin qabanii	1.eyye 2.miti	
407	Hojetonnii nyaata arka dhiqachuf samunafi bishan ho;a fayadamu qabu	1 eyye 2 miti	
408	Miicuun faalama ittisa sanitaiz gochun immo jarmii ajeesa	1.eyye 2.miti	
409	Fayidaan hygieinii dhukuba kara nyaata dhufu ambisuuf	1.eyye 2.miti	
410	Gilavii dhuma ittin firafire qopeseen foonis qopheesa	1.eyye 2.miti	

6. Gaaffiwan amaloota hojetoota ilaalu.

lako	Gaafilee	deebii				
		Baayyen itti walii hin galu	Itti walii hin galu	Hin beekamu	Ittin waliigala	Baayyen itti waliigala
501	Sirritti qulqulina nyaata eeguun ga'e hojii kootiiti					
502	Yero hojitti qulqulina dhuunfaa eeguun sadrkaa ol'aanaa qaba					
503	Arkakoo dhiqachun dhukuboota dadarboo irra sirritti ittisu danda'a					
504	Utuu go'antii harka kooti hin godhatiin dharkakoon dhiqa					
505	Gilavii godhachun sababa faalama nyaata qopha'e ni irrisa					
506	Hojetoota nyataa waa'e hygene nyaata leenjisuun qulqulina nyataa eeguuf nigargaara					
507	Nyaata dheedhifibilchaataa adda baasun nibarbaachisa					
508	Nyaanni sirritti bilchaate jarmii irra qulqulludha.					
509	Tmprecherii firijii yero yeron hordofuun barbaachisaa dha.					
510	Yoon dhukuboota dadarbaan dhukubsadhe eeyaman fudha malee hojii hin galu.					

