

# Hygienic and Sanitary Practices of Street Food Vendors in the City of Addis Ababa, Ethiopia

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## Abstract

Street food vending is one of means of income generation in most of developing countries. A total of 140 street food vendors in two sub-cities were investigated from September 2014 to March 2015. The aim of this study is to investigate the hygiene of street vendors and sanitary conditions of vending sites on the streets of Addis Ababa. A structured questionnaire, interviews and extensive observation were used in the study. Most of street vendors (78.6%) were women. The majority of the vendors (68.5%) had either primary or no education. Among the vendors 88.6% didn't have apron and 95% were not covered their hair during cooking process. In the two sub-cities, vendors had access to tap water at less than five minute walk. Jerry cans were commonly used for water storage. 35% of street food vendors were changed the cleaned utensil water when only it is dirty. Largest number of street vendors (90.7%) was used recycled paper to serve the consumers. All the vendors (100%) handled money with bare hands while serving food. All of the vendors had no health certificate from authorized dignitary. 78.6% of the vendors prepared their food along the road side. Although street vended food is a means of income generation at the household level but the way food prepare and sold is in unsanitary environment. Awareness creation plays a key role for food safety and handling so that the concerned bodies should commit for providing food safety training to street vendors.

**Keywords:** street food vendors, health certificate, unsanitary environment, food safety

## 1. Introduction

In Ethiopia, like other developing countries, street food vending is one of means of income generation and women play a dominant role for this sector. Street-vended foods or street foods are those foods and beverages that are prepared and/or sold by vendors on the street and in other public places for immediate consumption or for consumption at a later time without further processing or preparation (WHO, 1996). The quality of raw materials, food handling and storing activities are major factor that affect the safety of street food. Due to inconsistency of tap water, street food vendors obliged to use unclean water for cooking and washing their utensil which leads to health risk to consumers. The activities of street food carry out in dreadful environmental conditions, such as presence of insects, gaseous pollutants from air, dirt particles, domestic animals (Hanashiro et al., 2005).

In all steps of food storage and handling, street foods are at high risk of contamination. Street foods are sometimes stored at unsuitable temperatures and sold from vending sites which include kiosks, make-shift accommodation, and push carts as well as other temporary structures (FAO, 1990). They are prepared at very dirty environment with waste water and refuse dumped nearby, consequently nutrient and breeding ground for rodents and vermin (Barro et al., 2006). In most of the vending site, running water is not accessible so washing of hands and crockery are performed in bowls or buckets and sometimes without soap (Barro et al., 2006; Abdalla et al., 2008).

In the past few years, street foods are thriving in main towns of Ethiopia. Many people are involved in street foods business. It becomes common to watch street vendors around school, bus stations and other places where several people congested. In Ethiopia, all age groups are consuming street foods.

Addis Ababa is a fast growing capital city of Ethiopia growing rapidly in size and population and is characterized by "people on the move"; this makes conducive environment for the street food business which unfortunately operates under poor sanitary conditions. These situations oblige an appraisal of safety and sanitation of street foods being served in the city and mandatory for early identification of emerging food safety issues in order to prevent them from developing into health risks. This study was therefore undertaken to investigate the hygiene of street vendors and sanitary conditions of vending sites on the streets of Addis Ababa.

## 2. Materials and Methods

### 2.1. Study area and Design

The study was conducted from September 2014 to march 2015 in Addis Ababa, Ethiopia. The study encompassed two sub-cities in Addis Ababa (Gulele and Arada Sub-cities). From Gulele Sub-city, 4 areas (Kechene, Addisu Gebeya, Shiro-meda and Shegole) and from Arada Sub-city 3 areas (Piassa, Arat-kilo and Amist kilo) were chosen. The reason for selecting these two areas was due to high number of street food vendors and their customers were also enormous. Most of street food vendors prepared and sold their food in the open air

by the road side. The street foods that are commonly sold in the two sub-cities were chips (Slice of potato, cooked oil), ‘Sambusa’ (Wheat dough lentils, chopped onions, cooking oil) and ‘bonbolino’ (wheat dough, cooked oil).

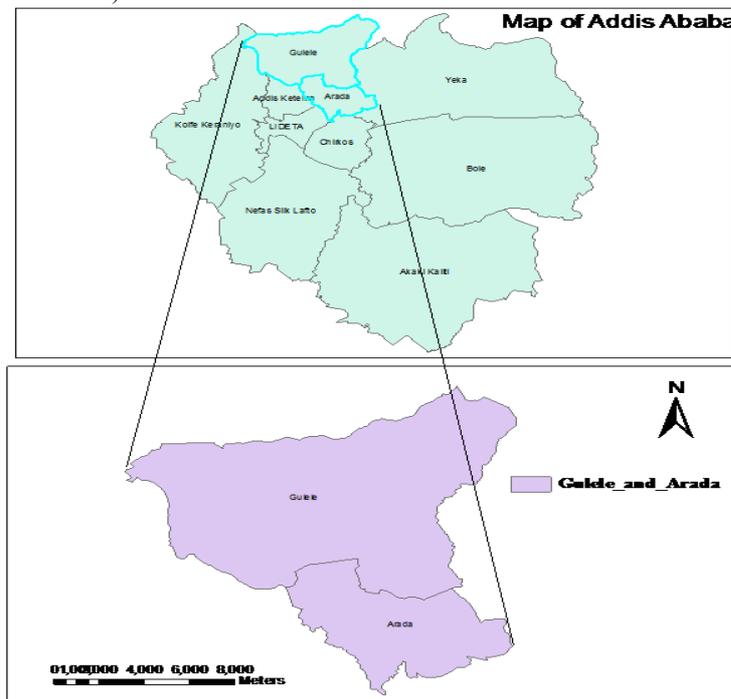


Fig. 1. Map of study area

## 2.2. Data Collection

Twenty street vendors were purposively selected from each of the seven areas. The total number of street food vendors include in the study was 80 in Gulele Sub-city and 60 for Arada Sub-city, giving a total of 140 street food vendors. Before starting of the survey, regular visits were made to the selected vendors to ask for their willingness to cooperate.

The study was conducted through administration of questionnaires and in-depth interview to obtain information pertaining to respondents' demographic characteristics, hygiene profiles of street food vendors, water supply and source, utensil cleaning, food serving and handling practice, possession of health certificate. The questionnaires were delivered to the vendors at their working places and with the help of assistants those who cannot read were given a hand to answer it. Moreover an observation checklist was used to determine sanitary condition of surrounding environment.

## 2.3. Statistical analysis

Data obtained from the study were analyzed by using SPSS version 16.0. Pearson correlation was used to test relationships of variables within the sub-cities. Level of significance was set at 95%.

## 3. Results and Discussions

### 3.1. Demographic characteristics of street vendors

Demographic characteristics of street food vendors are presented in Table 1. The results showed that majority (78.6%) of the street food vendors were women. In this study the number of men engaged in street food vending was 30 (21.4%). Nurudeen et al. (2014) stated that most of street food vendors (80.9%) were women in Kaduna, central Nigeria. A similar study by Muyanja et al. (2011) revealed that most of (87.6%) street food vending was carried out by women in Kampala, Uganda. Studies by Monney et al. (2013); Sarkodie et al. (2014); Omemu and Aderoju (2008) claimed that majority of the street food vendors were women in Konongo, Ghana; Sunyani, Ghana; Abeokuta, Nigeria respectively. This showed that women play a significant role in street food vending.

**Table 1** Demographic characteristic of street food vendors in Gulele and Arada Sub cities.

Parameter	Gulele (n = 80)	Arada(n = 60)	Total (n = 140)
<b>Gender</b>			
Male	19(23.7) <sup>a</sup>	11(18.3)	30(21.4)
Female	61 (76.3)	49(81.7)	110(78.6)
<b>Age (Years)</b>			
<20	10(12.5)	7(11.7)	17(12.1)
21-30	24(30)	17(28.3)	41(29.3)
31-40	29(36.2)	24(40)	53(37.9)
41-50	13(16.3)	9(15)	22(15.7)
>50	4(5)	3(5)	7(5)
<b>Education level</b>			
None	19(23.8)	12(20)	31(22.1)
Primary	38(47.5)	27(45)	65(46.4)
Secondary	23(28.7)	21(35)	44(31.4)
<b>Marital status</b>			
Married	46(57.5)	34(56.6)	80(57.2)
Single	27(33.8)	21(35)	48(34.3)
Divorced	5(6.2)	4(6.7)	9(6.4)
Widowed	2(2.5)	1(1.7)	3(2.1)

<sup>a</sup> Figures in parentheses are percentage

Most of the street vendors surveyed their ages lies from 21 to 40 years. Small numbers of respondents were above 40 years (20.7%) or less than 20 years old (12.1%). 68.5% of the street food vendors had either primary or no education and 31.4% of them had secondary education. According to Nurudeen et al. (2014) 52.9% of street food vendors had primary education and secondary education level was the lowest. Similarly Dwumfour and Agyapong (2014) reported that among 50 street food vendors 26 (52%) had no education and 15(30%) had primary education in Aboabo, Ghana. The low education levels linked with poor hygiene practices during handling and storage of foods which leads to threat of street food contamination (Kitagwa et al., 2006). Regarding to marital status 46 (57.5%) in Gulele sub-city and 34 (56.6%) in Arada sub-city of street food vendors were married.

### 3.2. Hygiene profiles of street food vendors

The information obtained based on the hygienic practices using the questionnaire is summarized in the Table 2. The results revealed that the majority of the vendors did not have apron 124 (88.6%) while only 16(11.4%) had apron. Similar study by Nayansi et al. (2014) pointed out that 86% (n= 30) vendors didn't have apron. A study by Nurudeen et al. (2014) stated that more than 50% of the vendors did not use apron. In contrast to this study Muhonja and Kimathi, (2014) reported that majority of vendors (63%) had aprons. The data indicated that 133 (95%) of the vendors did not cover their hair. In order to prevent falling of loose hair and dandruff during food preparation street food vendors must cover their hair. Among the food vendors 52 (37.1 %) of vendors had short nails which were not polished.

**Table 2** The level of personal hygiene, food handling and sanitary practices among street food vendors in Gulele and Arada Sub-cities.

Parameter	Gulele (n =80)	Arada (n =60)	Total (n =140)	p-value
<b>Hygiene Practices</b>				
Apron used	10(12.5) <sup>a</sup>	6(10)	16(11.4)	0.39
Hair covered	4(5)	3(3.8)	7(5)	0.642
Neat/clean finger nails	28(35)	24(40)	52(37.1)	0.915
<b>Availability of water at vending site</b>				
On Site	7(8.8)	9(15)	16(11.4)	0.339
< 5 minute walk	41(51.2)	30(50)	71(50.7)	
5-15 minute walk	19(23.8)	13(21.7)	32(22.9)	
> 15 minute walk	13(16.2)	8(13.3)	21(15)	
<b>Water usage for cooking</b>				
Direct pipe water	7(8.8)	9(15)	16(11.4)	0.183
From jerry cans	64(80)	39(65)	103(73.6)	
Bucket	9(11.2)	12(20)	21(15)	
<b>How often is the water for cleaning utensil changed?</b>				
Once	13(16.2)	10(16.7)	23(16.4)	0.125
Twice	18(22.5)	14(23.3)	32(22.9)	
When dirty	29(36.3)	20(33.3)	49(35)	
Until finished	20(25)	16(26.7)	36(25.7)	
<b>How do you serve the food items to clients?</b>				
Recycled Paper	73(91.2)	54(90)	127(90.7)	0.694
Plastic bags	7(8.8)	6(10)	13(9.3)	
<b>Serving of food</b>				
Food served with fork/spoon	45(56.3)	24(40)	69(49.3)	0.067
Food served with bare hands	13(16.2)	16(26.7)	29(20.7)	
Food served using paper	22(27.5)	20(33.3)	42(30)	
<b>Handling food without washing hands</b>				
Yes	72(90)	49(81.7)	121(86.4)	0.465
No	8(10)	11(18.3)	19(13.6)	
<b>Did you handle money with bare hands when serving food?</b>				
Yes	80(100)	60(100)	140(100)	
No	0(0)	0(0)	0(0)	
<b>Food sold with covering</b>				
Yes	15(18.8)	17(28.3)	32(22.9)	0.324
No	65(81.2)	43(71.7)	108(77.1)	
<b>How often is oil used for frying changed?</b>				
Daily	15(18.8)	10(16.7)	25(17.8)	0.679
Weakly	35(43.7)	26(43.3)	61(43.6)	
Monthly	30(37.5)	24(40)	54(38.6)	
<b>Health certificate</b>				
With	0(0)	0(0)	0(0)	
Without	80(100)	60(100)	140(100)	

P-value of <0.05 was considered statistically significant

<sup>a</sup> Figures in parentheses are percentages

### 3.2.1. Water supply and source

For most of the vendors water was available at less than five minute walk (Gulele Sub city (51.2%), Arada Sub City (50%). There is no significant difference ( $p = 0.339$ ) between the two sub-cities on availability of water. Regarding to water usage for cooking, most of the vendors (73.6%) were used jerry cans water for cooking and only 11.4% were used direct pipe water. During the interview, the vendors claimed that water supply in the city

was by shift so that most of the times direct pipe water was not available.

### **3.2.2. Utensil Cleaning**

Most of the street food vendors (35%) changed the cleaned utensil water when only it is dirty and 36(25.7%) unchanged the cleaned water until they finished the cooking process. The reason for using the water repeatedly was due to scarcity and shifting of water distribution in the city. Majority of the vendors didn't use soap for washing their plates. Most (84%) of the street food vendors unchanged the rinse water until it is dirty (Muyanja et al., 2011).

### **3.2.3. Food Serving and Handling practice**

Largest number of street vendors (90.7%) were used recycled paper to serve the consumers and only 9.3% were used plastic bag "festal". The poor handling and storage of recycled paper and plastic bag leads to pathogenic contamination (Barro et al., 2007). Practicing of simple vending materials by vendors enhance the invasion of dirt and microorganisms thus increasing the risk of contamination. 69(49.3%) of the vendors served food with fork while 42 (30%) were used piece of paper to delivered food to the consumer. During the survey I confirmed that particularly "Bonbolino" and "Sambusa" served to the consumer by piece of paper. Only 29 (20.7%) served their food with bare hands. The majority of street vendors (86.4%) were handled food without washing their hands. Only (13.6%) were washed their hands before delivered the food. All the vendors (100%) handled money with bare hands while serving food. Similar study by Muinde and Kuria (2005) insisted that all of street food vendors were handled money while serving food. Most of the vendors did not cover the food 65 (81.2 %) in Gulele Sub-city and 43 (71.7%) in Arada Sub-city kept their food uncover and hence the food exposed to flies and other contaminants. Omemu and Aderoju (2008) pointed out that among 87 street food vendors 31(36%) were not covered the processed food.

### **3.2.4. Usage of Cooking Oil**

Regarding to use of cooking oil 38% of the vendors were changed cooking oil monthly and 43.6% of street food vendors were changed weakly. There is no significant difference ( $p = 0.679$ ) between the sub-cities on using cooking oil. A study by Muyanja (2011) found out that less than 45% of street food vendors in all districts were used cooking oil daily. According to Srivastava et al. (2010) re-using oil at high temperatures increased the possible risk of carcinogenicity and genotoxicity. Dietary intake of repeated heated vegetable derived oil like soy oil changes in serum IL-6 and osteocalcin which leads to structural bone loss in the long term (Ima-Nirwana et al., 2007).

### **3.2.5. Possession of Health Certificate**

Among street food vendors no one had health certificate from authorized dignitary (Table 2). Similar study by Omemu and Aderoju (2008) reported that 69% of the vendors could not present the health certificate. Ackah et al. (2011) also claimed that 60% of the interviewed vendors had no health certificates. Medical examination of food vendors is one of the common ways to standardize street vended food in developing countries (Musa and Akande, 2002).

### **3.3. Sanitary condition of surrounding environment at the vending site**

Sanitary condition of surrounding environment at the vending site is shown in Table 3. Based on observation, 78.6% of the vendors prepared their food along the road side. Only 21.4% was prepared in stall. In most of the vending site vehicles were passed which released dust and gaseous pollutants. Moreover in some areas wastewater drainage tunnels were found in the vicinity of vending site. According to WHO (1996) food should be prepared and sold in a clean, well-lit place protected from strong sun, dust, rain and wind. It should be away from sources of contaminants such as solid and liquid wastes, and from animals, including pets as well as pests.

**Table 3** Sanitary environment surrounding the vending site in Gulele and Arada Sub-cities.

Parameter	Gulele (n =80)	Arada (n =60)	Total (n =140)	p-value
<b>Type of vending site</b>				
Road side	62(77.5) <sup>a</sup>	48(80)	110(78.6)	0.465
Stall	18(22.5)	12(20)	30(21.4)	
<b>Surrounding of vending site</b>				
Clean	30(37.5)	24(40)	54(38.6)	0.236
Not clean	50(62.5)	36(60)	86(61.4)	
<b>Number of dust bins at site</b>				
One	15(18.8)	13(21.7)	28(20)	0.141
Two	1(1.2)	2(3.3)	3(2.1)	
None	64(80)	45(75)	109(77.9)	
<b>Final garbage disposal method</b>				
Garbage container	26(32.5)	25(41.7)	51(36.4)	0.932
On the street/road	17(21.2)	21(35)	38(27.2)	
Drainage/Gutter	37(46.3)	14(23.3)	51(36.4)	

P-value of <0.05 was considered statistically significant

<sup>a</sup> Figures in parentheses are percentages.

A study by Nayansi et al. (2014) revealed that 33% of vending site had wastewater drainage tunnels. Muinde& Kuria (2005); Mensah et al. (2002) claimed similar observations that carried out their research on street foods in Nairobi, Kenya and Accra, Ghana. 61.4% of the vendors prepared food in an unclean environment with flies all over the place. FAO (1995) pointed out that street vended food should be prepared in a clean environment and must be at a distant from any source of contamination like wastewater, dust, rubbish and animals.

### 3.3.1. Waste Disposal Method

In most of vending site (77.9%) had no garbage bin and 20% had only one garbage bin (Table 3). There is no significant difference (0.141) between the two sub-cities using dust bin. 36.4% of the vendors were used waste container to keep their waste while the rest of the vendors dumped their wastes on streets, major roads and drainage channels. FAO/ WHO (1999) insisted that suitable waste disposal and wastewater drainage system must be available in the street food business and well designed in order to avoid risk of food and water contamination.

## 4. Conclusions

Although street vended food is a means of income generation at the household level but the way food prepared and sold is in unsanitary conditions. There is lack of awareness about food safety and handling among the vendors. Awareness creation plays a key role for food safety and handling so that the concerned bodies like health bureau should commit for providing food safety training to street vendors. To reduce food borne disease due to consumption of street vended food the accessibility of safe and clean water is crucial so that the concerned bodies are responsible for regular delivering clean water for street vendors. Ministry of health has responsibility for regular checkup the health of street food vendors and giving health certificate for them. In addition to these government committed to provide basic infrastructure to the vendors. Although vendors get essential training for food safety while without infrastructure is worthless.

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.97 Hygienic and sanitary practices of street food vendors in the city of Addis Ababa, Ethiopia.98.Â EPHI conducts research on Nutrition, traditional medicines, and medical practices as well as on the causes and spread of diseases. The Institute is an autonomous public authority having its own National legal personality. Recently, nutrition and health, research ventures in Ethiopia have stated to be viewed as essential component of better health status and general wellbeing of the population. Similar results were reported in Ethiopia by Eliku (2016) on their study investigating food hygiene and sanitary practices of SFVs in the city of Addis Ababa. In their study, they reported that 88.6% of vendors did not wear aprons, 95% had uncovered hair while all street vendors (100%) handled money with bare hands while serving food. Food safety knowledge and practices of street food vendors in selected locations within Kiambu County, Kenya. Article. Full-text available.Â A total of 140 street food vendors in two sub-cities were investigated from September 2014 to March 2015. Knowledge and Practice of Food Hygiene Among Food Vendors in Ihiagwa, Owerri West Local Government Area, Imo State. Article. Full-text available. Addis Ababa city. Different researches have been carried out on raw fruits and vegetables. But none of them focus on the bacteria quality and safety of fruit juices and vegetable salads served in the fruit juice houses. Due to lack of awareness fruit juice vendors thought that fruits and vegetables once washed and sanitized are free from microorganisms. In larger cities, like Addis Ababa due to change in lifestyle consumption of ready to eat foods like fruit juices and vegetable salads are becoming common in most parts of the country.Â It helps to aware people about the health risks that possibly associated with consuming unpasteurized fruit juice and vegetable salad from street vendors. 6. 1.4.Objectives. General objective. Street food is food obtained from a street side vendor, often from a makeshift or portable stall and it feeds millions of people daily with a wide variety of foods that are relatively cheap and easily accessible. Street food is intimately connected with take-out, junk food, snacks, and fast foods but it is not protected against insects, dust etc; which may harbor foodborne pathogens.Â Bacteriological quality of street vended food Panipuri. A case study of Amravati city (ms) India. Bioscience discovery. 2011; 2: 350-354. <https://tinyurl.com/y6rp7x2d>.Â Muinde OK, Kuria E. Hygienic and sanitary practices of vendors of street foods in Nairobi, Kenya. African Journal of Food Agriculture & Nutritional Development. 2005; 5: 1â€“14. <https://tinyurl.com/yxanlxpy>. Mwangi AM.