

Hygiene Practices Among Food Vendors in Hohoe Township

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Abstract: Background: Street food vending has become a very lucrative business across all parts of the globe. However, little attention has been given to the safety of such foods thus, becoming a great challenge to public health. This study was conducted to examine the hygiene practices observe by food vendors at sites where food is prepared and sold in the Hohoe Township. Method: This was a cross-sectional study which employed simple random sampling technique to select 187 respondents over the period of July to December, 2015. Chi square test was used to test for association between some selected variables at a significant level of 0.05. Data was entered into *epi* data version 3.1 and exported to Stata version 11 for analysis. Result: Of the 187 respondents, majority of 181(96.79%) were female with 113(60.43%) attaining the basic school education. About 35(18.7%) used their bare hands in picking food for customers with 149(78.92%) been medically screened. A little more than half (55.08%) did not cover their hair when selling and only 72(38.50%) wore apron during sales of food. One hundred and sixty (86.89%) sold food very close to open gutters but only 29(27.36%) paid attention to the cleanliness of such gutters. An association existed between level of education and knowledge on hygiene practices among respondents but was not significant [Chi square=1.3024, p value=0.729]. Also, an association existed between type of food vendor and knowledge on hygiene but not significant [Chi square=2.8331, p value=0.418]. Conclusion: Most food vendors in Hohoe have some fundamental knowledge on hygiene but this does not reflect in their routine practices. Periodic training and education of food vendors on hygiene and its standards can help ameliorate their practice on food hygiene.

Keywords: Food Vendor, Hygiene Practices, Food Safety, Food and Water Hygiene, Food Borne Infections

1. Introduction

Street food vending has become an integral part of all societies in the underdeveloped, developing and developed countries. As such, the standard of hygiene maintained is a very vital matter [1]. Nevertheless, the activities indulged by some group of food vendors during handling of food cannot be compromised. Cholera has been a public health burden in Ghana since the 1970s [2, 3] and it still continued to exist due to poor sanitation and the unhygienic state of the food and water that we ingest [4]. It was estimated that 70% of disease outbreaks is associated with street vending foods [5-7].

Activities of food vendors such as the habit of not washing hands and improper handling of money with food cannot be overemphasized as they have been implicated in food borne illnesses [8]. Food borne infections are associated with some risk factors such as the ingestion of food and water contaminated by strands of micro-organisms, poor

environmental sanitation and hygiene, and improper handling of food by food vendors. These risk factors might not be excruciating when intensive food and water hygiene practices are observed. An article reviewing the role of food workers in a food borne outbreak ascertain that certain pathogens can originate from infected food workers, raw foods or surrounding environment and these can spread during the food preparation session to the infected workers themselves or other susceptible consumers [8]. A study conducted on the microbial quality of foods sold on streets of Accra has revealed that street food is a source of enteropathogens [9].

There are so many activities carried out by food vendors which do not meet the required standard of food hygiene [10-12]. Some food vendors typically use the same water over and over throughout the day without changing it even once, thereby permitting substantial amounts of dissolved organic matter and in some cases fecal contamination to provide an ideal culture medium for bacteria [11].

During cholera outbreaks, people are sensitized on the need to avoid patronizing street food. However, majority of the population are adamant to neglecting street food. Street food therefore needs more hygienic attention to make it safe for consumption. The focus of this study is to examine the practice of hygiene among food vendors in the Hohoe Township and propose interventions which can help increase the knowledge and practices of food vendors on hygiene.

2. Methods

2.1. Study Area

Hohoe is one of the seven (7) Sub-Municipals in the Hohoe Municipality and at the same time the Municipal's capital. It is located about 78 kilometres away from Ho, the Regional capital and 220 kilometers from Accra, the Nation's capital. The Municipal has a total land surface area of 1,172km² and is located within longitude 0 degrees 15'E and 0 degrees 45'E and latitude 6 degrees 45'N and 7 degrees 15'N and lies almost in the heart of the Volta Region.

Ten CHPS zones, one Reproductive and Child Health (RCH) clinic, one Health Centre and one Government hospital which serve a total population of 58,130 in 33 communities are found in Hohoe. The major activities with respect to commerce, trade and industry include trading services, agriculture, food vending, small scale processing and manufacturing. There is an increasing number of hawkers on the streets of Hohoe. Commodities traded in Hohoe are principally food stuffs and general goods including manufactured goods. The urban-based activities are scattered throughout town and not conforming to any proper land use. The practice has serious environmental implications in terms of pollution and beauty of Hohoe Township.

2.2. Study Design

Cross sectional design was used to collect information on respondents regarding their knowledge and practice of appropriate hygiene during handling of food. Food vendors who operated at restaurants, chop bars, school canteens and the road side within the municipality of Hohoe constituted the study population.

2.3. Sampling Procedure

Record of food vendors screened in Hohoe in the year 2014 was obtained from the Environmental Health Unit of the Municipal Assembly. Information on name, sex, age, location, contact and type of food sold were contained in the food vendor's record book. The record contained 313 food vendors but per the criteria for inclusion in the study, food vendors who sell pastries and other ready to eat foods (provisions) were excluded. Food vendors who sell directly cooked foods as seen in the record book were 187 and this became the sample size used for the study. Selection of subjects was based on contacting them through their phone numbers provided in the screening record book.

2.4. Data Collection and Analysis

Participant observation and semi-structured questionnaires were used to collect both quantitative and qualitative data from the respondents. Data was collected during the day and night time but on different respondents. Data gathered was entered into *epi* data version 3.1 and exported to Stata version 11 for analysis. Frequency tables were used to show the responses obtained from the respondents. Chi square test was employed to show association between knowledge and educational level attained by subjects as well as knowledge and type of food vendor at a significance level of <0.05. Food vendors were observed to see how they practice hygiene. By so doing, five different indicators for hygiene which are cleanliness and length of fingernails, coverage of hair, presence of open and uncleansed gutter, appearance of water used in washing plate and presence of apron were used. A food vendor who has less than three of the indicators absent or not appropriate were considered as having little knowledge on hygiene and those with more than three of such indicators appropriately were captured as having knowledge on hygiene hence they practice it.

2.5. Ethical Issues

Approval was sought from the Ghana Health Service Ethical Review Committee (GHS-ERC 04/06/15) in Accra. Permission was also sought from the Municipal Health Directorate and the Environmental Health Department before the study was carried out. Informed consent was obtained from the respondents before engaging them in any interview.

3. Results

3.1. Demographic Characteristics of Respondents

Of the total of 187 food vendors who sold food in Hohoe, 181(96.79%) were female with majority (32.62%) aged between 30-39 years. Most (60.43%) of the food vendors had attained the basic school education with only a few (3.21%) attaining tertiary education. Surprisingly, 21.39% of the food vendors had no formal education. In terms of religion, most of the food vendors in the study were Christians (61.50%) and the rest 38.50% being Muslim. Refer to table 1 below for characteristics of participants.

Table 1. Demographic data of food vendors.

Sex of participant	Frequency	Percent (%)
Male	6	3.21
Female	181	96.79
Total	187	100
Age group/yrs.		
< 20	14	7.49
20-29	57	30.48
30-39	61	32.62
40-49	39	20.86
50+	16	8.56

Sex of participant	Frequency	Percent (%)
Total	187	100
Level of education		
Basic school	113	60.43
Secondary	28	14.97
Tertiary	6	3.21
No formal education	40	21.39
Religion		
Christian	115	61.50
Muslim	72	38.50
Traditional	0	0.00

3.2. Items Used in Serving Different Kinds of Food

Majority (23.53%) of the food vendors in Hohoe sell kenkey followed by wakye (22.88%). About 27% used their bare hands in dishing out food with kenkey sellers forming the majority (83.33%). Food vendors who sold wakye and plain rice used either ladle (45.71%) or spoon (48.57%) in dishing out food but about 5.71% of such vendors sometimes used bare hands in picking meat and fish. All the 31(100%) porridge vendors used small cups in serving food for customers. Refer to Table 2 below.

Table 2. Food item sold and the items used in serving the food by food vendor.

Type of food	Freq./ (percent)	Items used in serving food	Freq./ (percent)	Total
Kenkey	36(23.53)	Bare hand.	30(83.33)	36(100%)
		Bare hand with rubber worn.	6(16.67)	
		Spoon.	17(48.57)	
Wakye	35(22.88)	Spoon & ladle.	16(45.71)	35(100%)
		Bare hand.	2(5.71)	
Porridge	31(20.26)	Cup.	31(100)	31(100%)
		Spoon.	12(80.00)	
Plain rice	15(9.80)	Spoon & Fork.	3(20.00)	15(100%)
		Spoon.	9(64.29)	
		Spoon & Fork.	2(14.29)	
Beans & gari	14(9.15)	Bare hand.	3(21.43)	14(100%)
		Spoon.	7(58.33)	
		Ladle.	5(41.67)	
Banku	12(7.84)	Bare hand.	0(0.00)	12(100%)
		Ladle/spoon.	3(100)	
		Bare hand.	2(50.00)	
Fufu	3(1.96)	Bare hand with rubber worn.	2(50.00)	4(100%)
		Fork.	0(0.00)	

3.3. Chi square Test of Association Between Knowledge on Hygiene and Some Variables: Level of Education Attained and Type of Food Vendor

Table 3. Level of education attained against knowledge on hygiene practices.

Highest Level of education attained	Knowledge on Hygiene		Total
	NO	Yes	
Basic school	13	100	113
Secondary	2	26	28
Tertiary	0	6	6
No formal education	5	35	40
Total	20	167	187

[Chi square= 1.3024; p value =0.729]

Table 4. Type of food vendor and knowledge on hygienic practices.

Type of food vendor	Knowledge on Hygiene		Total
	NO	Yes	
Road Side	20	146	166
School Canteen	0	10	10
Chop Bar	0	10	10
Restaurant	0	1	1
Total	20	167	187

[Chi square= 2.8331; p value =0.418 >0.05]

Pearson chi square was used to establish if an association exist between level of education attained by subjects and their knowledge in hygiene practices. The test revealed an association between level of education attained and knowledge on hygiene. The higher the level of education attained by the food vendors, the higher their knowledge level and practice of hygiene. [Chi square= 1.3024; p value =0.72] as seen in table 3 above.

A similar test was used to establish if an association exist between type of food vendor and their knowledge level on hygiene. An association existed between the two variables [Chi square= 2.8331; p value =0.418]. Across the table, food vendors who operate at road side recorded the highest number of those who have no knowledge on hygiene as seen in table 4 above.

3.4. Practice of Personal Hygiene by Respondents.

Of the 187 food vendors observed, about 80% kept their finger-nails clean and short. Majority (55.08%) did not cover their hair during sale of food and 115(61.50%) did not use apron during sales of food. Almost all the respondents (98.93%) were in unprotected foot wears. About 55% washed their hands frequently during sales of food with 34.76% not washing hands at all in the course of selling. Majority of 179(95.72%) wore nothing on their hands before serving

food. What a few (4.28%) of them wore in very rare occasions is the polythene rubber. Information on practice of personal hygiene by food vendors is seen in Table 5 below.

Table 5. Practice of Personal Hygiene among Participants.

Personal hygiene	Frequency	Percent (%)
Keep fingernails clean and short		
Yes	149	79.68
No	38	20.32
Cover hair during sale of food		
Yes	84	44.92
No	103	55.08
Usage of apron during sale of food		
Yes	72	38.50
No	115	61.50
Wearing a protected foot wear		
Yes	2	1.07
No	185	98.93
Number of times hands are washed		
Once	7	3.74
Twice	8	4.28
Thrice	5	2.67

Personal hygiene	Frequency	Percent (%)
More than thrice	102	54.55
Not washed at all	65	34.76
What food vendor wear on hand before serving food		
Hand gloves	0	0.00
Polythene	8	4.28
Wears nothing	179	95.72

3.5. Practice of Food, Water and Environmental Hygiene by Respondents

Majority (94.74%) of the food vendors provided drinking water in well covered vessels. Most (39.04%) kept water used in washing utensils soapy while a proportion kept the water either oily (11.76%) or dirty (21.39%). Majority (83.72%) did not change water used in washing plates very often with 2.91% not changing water at all. About 79% of the respondents did not keep food on fire during sales. A large percentage (86.89%) sold food very close to an open gutter of which only 27.36% paid attention to the cleanliness of the gutter. Information can be found in Table 6 below.

Table 6. Food, water and environmental hygiene practiced by participants.

Food and water hygiene	Frequency	Percent (%)
Covering of drinking water		
Yes	126	94.74
No	7	5.26
Appearance of water used for washing plate		
Water with soapy appearance	73	39.04
Water with oily appearance	22	11.76
Water with dirty appearance	40	21.39
Clean water	37	19.79
Number of times water used in washing plates changed		
Very often	23	13.37
Often	144	83.72
Not changed at all	5	2.91
Food covered neatly to avoid flies and dust		
Yes	174	93.05
No	13	6.95
Food kept on fire during sales		
Yes	40	21.39
No	147	78.61
Plates/bowls used for serving food is clean		
Yes	174	93.05
No	13	6.95
Environmental hygiene		
Accumulation of filth near where food is sold		
Yes	32	17.11
No	155	82.89
Presence of an open gutter		
Yes	106	86.89
No	16	13.11
Open gutter clean		
Yes	29	27.36
No	77	72.64
Presence of sanitary facilities to food vendor		
Yes	30	16.04
No	157	83.96

3.6. Practices Carried Out by Type of Food Vendor

This section revealed the activities carried out by the

specific group of food vendors involved in this study. Majority (79.68%) of the food vendors in Hohoe were medically screened with 44.30% providing evidence of screening done. Majority (84.45%) prepared food in their

homes before moving to the selling site but a number of them who operated in chop bars (80%) and sometimes the road side (9.04%) prepared food at site where food is sold. Food vendors who sell at the road side took longer time period (45-

60 minute) to move food to selling site. Most (39.57%) food vendors claimed they do not attend to natures call when selling but the few (28.88%) who sometimes respond did that at the public toilet. Refer to table 7 below for information.

Table 7. Some practices carried out by type of food vendor.

Variables measured	Road side vendor	School vendor	Chop bar vendor	Restaurant	Total
Medical screening done					
Yes	131(78.92%)	9(90.00%)	9(90.00%)	0(0.00)	149(79.68%)
No	35(21.08%)	1(10.00%)	1(10.00%)	1(100.00%)	38(20.32%)
Total	166(100%)	10(100%)	10(100%)	1(100%)	187(100%)
Evidence of medical screening					
Yes	58(44.27%)	3(33.33%)	5(55.56%)	0(0.00%)	66(44.30%)
No	73(55.73%)	6(66.67%)	4(44.44%)	-	83(55.70%)
Total	131(100%)	9(100%)	9(100%)	0(0.00%)	149(100%)
Type of water used in cooking					
Tap	161(96.95%)	10(100%)	10(100%)	1(100%)	182(97.33%)
Well	3(1.60%)	0(0.00%)	0(0.00%)	0(0.00%)	3(1.60%)
Bore-hole	2(1.20%)	0(0.00%)	0(0.00%)	0(0.00%)	2(1.20%)
Place where food is prepared before moved to selling site					
Vendor's house	148(89.16%)	8(80.00%)	2(20.00%)	0(0.00%)	158(84.45%)
Friend's house	3(1.81%)	0(0.00%)	0(0.00%)	0(0.00%)	3(1.60%)
Selling site	15(9.04%)	2(20.00%)	8(80.00%)	1(100%)	26(13.90%)
Total	166(100%)	10(100%)	10(100%)	1(100%)	187(100%)
Time taken to move food to selling site					
<15minute	76(50.33%)	5(62.50%)	1(50.00%)	-	82(50.93%)
15-30minute	34(22.52%)	3(37.50%)	0(0.00%)	-	37(22.98%)
30-45minute	13(8.61%)	0(0.00)	1(50.00%)	-	14(8.70%)
45-60minute	23(15.23%)	0(0.00%)	0(0.00%)	-	23(14.29%)
Other	5(3.31%)	0(0.00%)	0(0.00%)	-	5(3.11%)
Where food vendor respond to natures call					
Public toilet	48(28.92%)	1(10.00%)	5(50.00%)	0(0.00%)	54(28.88%)
House	38(22.89%)	3(30.00%)	4(40.00%)	1(100%)	46(24.60%)
Other	10(6.02%)	3(30.00%)	0(0.00%)	0(0.00%)	13(6.95%)
Do not attend to natures call	70(42.17%)	3(30.00%)	1(10.00%)	0(0.00%)	74(39.57%)
Total	166(100%)	10(100%)	10(100%)	1(100%)	187(100%)
Time taken to reach toilet					
<5minute	46(47.92%)	6(85.71%)	1(11.11%)	1(100%)	54(47.79%)
>5<10minute	41(42.71%)	1(14.29%)	8(88.89%)	0(0.00%)	50(44.25%)
20minute	5(5.21%)	0(0.00%)	0(0.00%)	0(0.00%)	5(4.42%)
30minute and above	4(4.17%)	0(0.00%)	0(0.00%)	0(0.00%)	4(3.54%)

3.7. Food Vendor's Knowledge on Hygiene

Almost all (97.86%) of the respondents have an idea on hygiene. Respondents were made to state the side effects of inappropriate food hygiene. Of the 187, 173(94.53%) stated that inappropriate food and water hygiene can lead to diseases. Others (4.92%) said one could be arrested by an environmental health officer and one also mentioned that it could lead to food contamination. Refer to table 8 and figure 1 below for information on test of respondent's knowledge on hygiene.

Table 8. Test of food vendor's knowledge on hygiene.

Do you have an idea of what hygiene is?	Road side food vendor	School food vendor	Chop bar food vendor	Restaurant	Total
Yes	162(97.59%)	10(100%)	10(100%)	1(100%)	183(97.86%)
No	4(2.41%)	0(0.00%)	0(0.00%)	0(0.00%)	4(2.14%)
Total	166(100%)	10(100%)	10(100%)	1(100%)	187(100%)
Have you receive any form of training in catering?					
Yes	50(30.12%)	5(50.00%)	5(50.00%)	1(100.00%)	61(32.62%)
No	116(69.88%)	5(50.00%)	5(50.00%)	0(0.00%)	126(67.38%)
Total	166(100%)	10(100%)	10(100%)	1(100%)	187(100.00%)

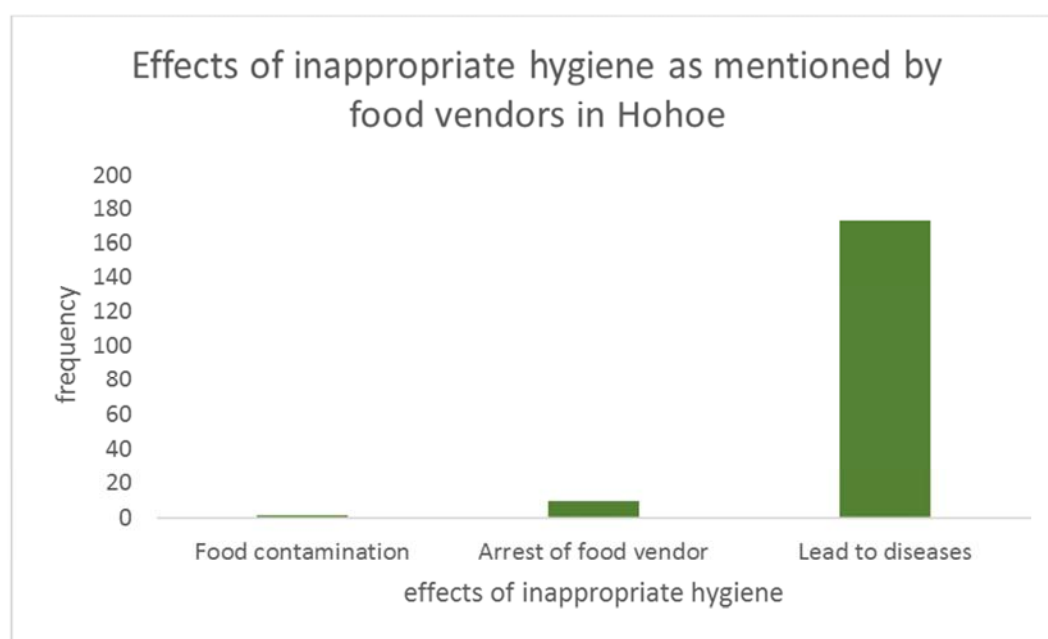


Figure 1. Bar chart showing the response of food vendors as the effects of inappropriate hygiene.

4. Discussion

The optimum aim of this study was to investigate the level of compliance of hygiene among food vendors who sell within the vicinity of Hohoe. The study revealed that, majority (96.79%) of food vendors who sell in Hohoe are primarily women, a result which is in line with a study conducted on food hygiene and Safety Practices among Street Food Vendors in Ghana [13]. The food vending business with women forming the majority is an act that follows the conformity to gender role postulated by most cultures in Africa. Most societies in Africa inclusively Ghana, assume that women are for the kitchen. As a result, it is perceived a strange thing to see a man with food on the head selling. It was found also that an association exist between level of education attained by food vendors and their knowledge on hygiene practices [Chi square=1.3024, p value=0.729]. Education therefore, have a bearing on the practice of hygiene among food vendors. Those who attained the Senior Secondary education had more knowledge on hygiene practices than food vendor who attended only basic or had no formal education.

4.1. Practice of Personal, Food, Water and Environmental Hygiene by Food Vendors

Most food vendors in Hohoe had some fair knowledge on hygiene. Nevertheless, their knowledge does not really reflect in their routine operations which is found to be consistent with a study conducted on the attitudes and practices of hygiene among food handlers in Accra [14]. Most of the respondents had mentioned that inappropriate hygiene can lead to diseases and can also cause an arrest of a food vendor by Environmental Health Officers who are in charge of hygiene. However, approximately 90% sell food very close to open

gutters of which only 27.36% pay attention to the cleanliness of such gutters. In addition, about 55% of food vendors did not cover their hair in the course of selling and a large percentage of 61.50% did not wear an apron when selling. It was further observed that the few that wear apron do not mostly use it for the intended purposes. An apron which is intended to prevent any contamination from the food vendor to food was rather used as a nape kin, face cleaner or a place for keeping money. In effect, the food vendor has already contaminated the apron without knowing. The failure of food vendors in applying some of the requirements of hygiene in their routine activities could possibly be that they were unaware of the dangers associated with such practices. Some may also be ill-informed of the fact that what they did was unhygienic. This is found to concur with a bulletin of the World Health Organization where a food vendor mentioned that she was unaware of the dangers associated with such activities until she attended a workshop for the first time on food hygiene [15]. To ensure water hygiene, pipe borne water was the major source of water used by most food vendors. However, as mentioned by most road side food vendors, they sometimes use other sources of water such as the bore-hole and dug out well for cooking during water crises. Generally, the study revealed a very good compliance with medical screening among the food vendors which is consistent with a similar study on Food hygiene and Safety Practices among Street Food Vendors in Ghana [13]. About 80% of the food vendors were medically screened for the presence of any disease before selling.

4.2. Practices Carried Out by Type of Food Vendor

Food vendors in this study were categorized into the following: road side, restaurant, school canteen and chop bar. Pearson chi square was used to establish if an association exist between type of food vendor and their knowledge on hygiene practices. It was found that an association exist

between the two [Pearson chi square=2.8331, p value=0.418]. Food vendors who operated in restaurants and school canteen demonstrated high compliance to hygiene than food vendors at road side and the chop bars. Those in restaurants and school canteens were mostly in uniforms and have their hairs covered. This practice will reduce the likelihood of contaminated food sold. Nevertheless, food vendors operating in chop bars and at the road side mostly leave their hairs uncovered, sell very close to opened and uncleansed gutters. Some also have no aprons. These practices have a high tendency of contaminating food. In addition, 10.7% representing 20 out of 187 food vendors were recorded as having no knowledge on hygiene and all these people fall under road side food vendors. It was found that majority of the road side food vendors took much longer time to move food to the selling site as compared to the other three groups. The road side food vendors normally prepare food in their homes before moving unlike the chop bar operators who prepare food at the on site where food is sold. Subsequently, the likelihood of cross contamination of food by the road side food vendors before food reaches selling site is high compared to the chop bar and restaurant operators. In addition, time to reach sanitary facilities by most road side food vendors is longer compared to the school canteen, restaurant and chop bar vendor who are advantaged since they have easy access to sanitary facilities built in schools, restaurants and the chop bars respectively. As a result, the likelihood for the road side food vendors to improvise is high. They may be forced to attend to nature's call or urinate in polythene bags in corners around their selling premises and this has high potential of contaminating food since due to absence of sanitary facilities, hardly will such food vendors wash their hands properly with soap.

5. Limitations

Data collection to observe compliance to hygiene among subjects was carried out both in the day and at night. As a result, there was a little difficulty in observing some practices at night among subjects hence some little bias in selecting an option for a particular subject. In addition the data collection procedure was delayed for some subjects since they were selling and at the same time attempting to answer questions. As a result, such subjects gave responses in a haste just to attend to customers and that some of their responses did not reflect exactly what was required of them.

6. Conclusion

Food vending has proven to be a profitable business across all part of the globe by providing employment to most women as well as providing inexpensive nutritious food to people at all times. Nevertheless, the level of safety offered to such foods is limited. Food vendors in Hohoe have appreciable knowledge on hygiene but this does not correlate with what they practice on the field.

Periodic education of food vendors through workshops by the

Environmental Health Departments on hygiene standards and the need for good hygiene can help foster the practices of hygiene among the food vendors. This will subsequently reduce food borne infections that accrue to patronizing street food.

Conflict of Interest

All authors report no conflict of interest in this study.

Authors Contribution

GEN developed the full proposal and wrote the zero draft of the paper. MPK supervised the proposal and proof read the manuscript. JD revised the results, worked on the questionnaire and checklist as well as the entire project. All authors approved the final manuscript.

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