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Food hygiene and Safety Practices among Street Food Vendors: An Assessment of Compliance, Institutional and Legislative Framework in Ghana

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Abstract This cross sectional study assesses compliance with eight food hygiene and safety principles among 200 randomly selected food vendors in two study locations in Ghana; Bibiani and Dormaa Ahenkro. Compliance levels were ranked according to a 5-point Likert scale based on calculated compliance scores. It also examines existing institutional and legislative framework for regulating the activities of food vendors in Ghana. Data collection was based primarily on extensive field observation and complemented by face-to-face interviews using structured questionnaires and in-depth interview with an experienced health official. The study observed a marginally good [overall compliance (OC) score = 0.67, on a 0 to 1scale] compliance with the food hygiene and safety principles with clear disparities between the two study areas: compliance at Dormaa-Ahenkro was relatively higher (OC-score = 0.71) than Bibiani (OC-score = 0.62). The pattern of compliance levels depicts very good compliance with medical screening (C-score = 0.91) but poor compliance with use of protective clothing (C-score=0.38). Statistically significant associations ($p<0.05$) were observed between majority (80%) of the food hygiene and safety principles and the study areas. The study identified weak institutional capacities; logistical constraints; overlapping and duplicated institutional responsibilities; inconsistent local bye-laws as key features of existing institutions and legislations, and proposes capacity building and harmonisation of institutional roles and legislations.

Keywords Street foods, Compliance, Food hygiene and safety, Food vendors, Hygiene practices, Institutional framework, Legislative framework

1. Introduction

Street foods generally refer to ready-to-eat foods and beverages prepared either at home or on the streets and sold by vendors, especially on streets and other public places [1, 2]. These foods provide a source of inexpensive, convenient and often nutritious food for both the urban and rural poor as well as attractive and varied food for tourists [3]. As a matter of fact, statistics by the FAO [4] point out that, 2.5 billion people eat vended food every day. Particularly for women in the developing world, street-vended foods also serve as a major source of livelihood providing a means of self-employment and the opportunity to develop business skills with low capital investment [5].

Despite the numerous benefits provided to people, street-vended foods can also be a source of foodborne illnesses resulting from poor hygiene practices by vendors, insanitary conditions at food vending points, among others [6-11]. According to Chapman et al. [12], about 70% of disease outbreaks have been linked to street-vended foods while evidence provided by Mensah et al. [2], point to the fact that, street foods are potential sources of enteropathogens. Estimates by the World Health Organisation [13] suggest that, food-borne illnesses account for about 2.2 million deaths annually, out of which about 86% are children. In Ghana, about 65,000 people die annually from food-borne diseases resulting in the loss of some US$69million to the economy [14]. More often than not, street food vendors are always at the end of accusing fingers for the spread of food-borne diseases, particularly cholera outbreaks, across the country and are sometimes banned momentarily as a desperate measure to control the outbreak [15, 16]. Therefore, the need for food vendors to adhere to high standards of hygiene and maintain clean vending environments cannot be overemphasized. This has prompted considerable research to assess hygiene and food handling practices among food vendors across the globe in order to contribute to efforts aimed at improving food handling practices. Generally, findings from such studies

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carried out particularly in the developing world point to poor hygienic practices among street food vendors and insanitary conditions at vending points. In Mauritius, a study involving 50 street food vendors, conducted by Subratty et al. [9], revealed poor hygiene practices among a majority of the food vendors. Similarly, poor hygiene practices and insanitary conditions at food vending points have been widely reported in other studies conducted in Ghana [3, 17-20] Sudan [21], Nigeria [22-24], Kenya [25], India [26] and USA [27].

Although numerous studies on food hygiene and safety have been conducted in Ghana, they are mainly limited to certain regions viz. Greater Accra, Ashanti and Northern regions as evidenced by the pattern of previous studies. There is therefore paucity of data on the levels of compliance among street food vendors in other regions such as the Brong Ahafo and Western Regions. Moreover, all these previous studies extensively focused on the hygiene practices of street food vendors without considering the existing institutional and legislative frameworks that have an impact on food safety among food vendors, to examine the strengths and weaknesses of these frameworks.

A number of studies [28, 29] on the institutional and legislative frameworks in some African countries have concluded that although these frameworks exist, further measures are required to ensure that they achieve the desired effects. According to these studies, existing frameworks are rendered ineffective due to weak institutional capacity of agencies and poor enforcement of laws thereby defeating the intended purpose for developing these frameworks. Could this also be a driving force behind the poor hygiene practices among street food vendors variously reported in literature?

Against this backdrop, this present study seeks to fill these knowledge gaps by assessing the levels of compliance with food hygiene and safety principles in two study areas in the Brong Ahafo and Western regions. It also examines the existing institutional and legislative framework for regulating the activities of food vendors in Ghana to identify the associated encumbrances and the requisite harmonisations. The outcomes would be valuable to legislators, policy makers and implementing bodies in adopting practicable strategies to ensure compliance with best practices among street food vendors in the country.

2. Materials and Methods

2.1. Description of Study Areas

The study was conducted in two study areas, namely Bibiani and Dormaa-Ahenkro in the Western and Brong Ahafo regions of Ghana respectively. Bibiani is the capital of Bibiani-Anhwiaso-Bekwai District located in the North-eastern part of the Western Region (Figure 1). It is approximately 390km North-West from Ghana's national capital, Accra, and 93km South West of Kumasi, Ghana's second largest city. Geographically, it lies on latitude 6°28'0"N and longitude 2°19'60"W and has a population of about 30,000. The township is endowed with rich mineral deposits, notably gold and bauxite, making mining the most important and lucrative economic activity. Dormaa - Ahenkro, on the other hand, is the capital of the Dormaa Municipal Assembly located approximately 80km West of the Brong-Ahafo regional capital, Sunyani, and 15km from Ghana's south-western border with Cote d'Ivoire. The Municipal covers an area of approximately 2,200 square kilometres with an estimated population of 160,000 (2010 estimate). Geographically, Dormaa-Ahenkro is located on latitude 7°17'0"N and longitude 2°53'0"W.

Figure 1. Map of Ghana showing study areas

Data collection was carried out predominantly through extensive field observation of 200 randomly selected stationary street food vendors (with equal proportions from Bibiani and Dormaa-Ahenkro). Compliance with selected food hygiene and safety principles, namely, use of protective clothing; provision of water and food vending site; cleanliness of finger nails; dishing out of food with appropriate kitchenware; protection of food from flies and dust; and head covering were also assessed among the vendors. This was complemented by face-to-face interviews using a structured questionnaire divided into various sections to capture information on socio-demographic characteristics; training on food hygiene and safety; medical

screening status; sanctions by local health authorities; and commonly experienced illnesses. The data were analyzed using SPSS version 17.0 for descriptive statistics, namely, frequencies and percentages.

Compliance levels of eight selected food hygiene and safety principles were based on a 5-point Likert scale which assigns a compliance level to a particular principle based on a computed compliance score (C-score) as shown in Table 1. The food hygiene and safety principles used in this study, for the most part, were selected from the recommended international code of practice: general principles of food hygiene developed by the FAO/WHO [30]. These are: provision of water at food vending site; cleanliness of vendors' finger nails; dishing out of food with appropriate kitchenware; protection of food from flies and dust; head covering; use of protective clothing; training on food hygiene and safety; and medical screening status.

C-scores were calculated from the equation below:

$$Compliance\ Score\ (C-score) = \frac{N_c}{T} \quad (1)$$

Nc = Number of food vendors complying with a particular food hygiene and safety principle

T = Total number of food vendors

Overall C-scores (OC- scores) were computed separately for each study area and both study areas based on the C-scores for the food hygiene and safety principles. This represents the overall average compliance to all the food hygiene and safety principles used in the study.

$$Overall\ Compliance\ Score\ (OC-score) = \frac{\sum_i^n C-score_i}{n} \quad (2)$$

$C\text{-score}_i$ = compliance score of the ith food hygiene and safety principle for a particular study area

n = n^{th} food hygiene and safety principle

To establish possible relationships between the selected food hygiene and safety principles and the study areas, the chi-square test and where necessary, Fisher's exact test were used. Statistically significant associations were declared at $p < 0.05$. In-depth interview with a Principal Environmental Health Officer with more than 20 years of work experience was also undertaken to obtain information regarding the challenges to enforcing laws on food hygiene and safety at the local level. The assessment of existing legal and institutional framework was carried out through rigorous review of secondary data.

3. Results and Discussion

3.1. Compliance with Food Hygiene and Safety Principles among Food Vendors

Table 2 shows the distribution of the socio-demographic characteristics of study respondents. Generally, the vendors in both study areas were predominantly females and constituted 95% of all respondents. The gender distribution of street food vendors in this study is in utter contrast with those reported by Muinde and Kuria [25] in Kenya; Chander et al. [31] in India; and Rosnani et al. [32] in Malaysia, where street food vendors were found to be rather dominated by males. It is however consistent with previous studies in Ghana [2, 18]; Ethiopia [33]; Nigeria [22, 23]; Cameroun [34] and South Africa [5]. Thus, the assertion that street food vending business in developing countries is a trade predominated by women may not be entirely true; rather it is dependent on the geographical region in question.

Age distribution showed similar bell-shaped patterns with modal age groups of 36-45 and 26-35 for Bibiani and Dormaa-Ahenkro respectively. Under-aged (<18 years) and elderly (>55) food vendors constituted insignificant proportions in both study areas and altogether constituted only 6% of the study respondents. Age wise, the distribution obtained for both study areas corroborates that of earlier studies in various countries which allude to massive involvement of people between the ages of 18 and 45 years in the food vending business.

In terms of the highest level of education attained by food vendors, the results pointed out that Junior High School education (41%) was the commonest among food vendors in both study areas while those with Senior High School education generally constituted the least proportion (15%). The pattern of highest educational levels attained by food vendors is in line with that of Apanga et al. [18] which found a predominant proportion of food vendors with Junior High School education but is in contrast with the findings of Edima et al. [34]. The distribution of work experience in both study areas depicts that, on the whole, about 8 out of 10 food vendors have been engaged in the street food industry for the past decade. This indicates a soaring interest in the street food vending business over the past decade in the study areas.

Table 1. Compliance scores and corresponding compliance levels

Compliance score	Compliance level	Description
0.0-0.20	Very Poor	0% - 20% of food vendors comply with a particular food hygiene and safety principle
0.20-0.40	Poor	20% - 40% of food vendors comply with a particular food hygiene and safety principle
0.40-0.60	Average	40% - 60% of food vendors comply with a particular food hygiene and safety principle
0.60-0.80	Good	60% - 80% of food vendors comply with a particular food hygiene and safety principle
0.80-1.00	Very good	80% - 100% of food vendors comply with a particular food hygiene and safety principle

Table 2. Socio-demographic characteristics of study subjects

Study parameters	Variables	Bibiani (%)	Dormaa-Ahenkro (%)	Total n (%)
Gender	Female	91	99	190 (95.0)
	Male	9	1	10 (5.0)
Age group	<18	4	1	5 (2.5)
	18-25	24	12	36 (18.0)
	26-35	24	41	65 (32.5)
	36-45	29	31	60 (30.0)
	46-55	17	11	28 (14.0)
	>55	2	4	6 (3.0)
Highest level of education	None	17	16	33 (16.5)
	Primary School	32	23	55 (27.5)
	Junior High School	38	44	82 (41.0)
	Senior High School	13	17	30 (15.0)
Work experience	Less than 5 years	38	50	88 (44.0)
	5-10 years	41	33	74 (37.0)
	11-15 years	13	11	24 (12.0)
	More than 15 years	8	6	14 (7.0)

From the results of the chi-square test, it was revealed that 5 out of the 8 food hygiene and safety principles showed statistically significant associations ($p < 0.05$) with the study locations. These principles were medical screening status, condition of finger nails, use of protective clothing, water availability at food vending point and adequate food protection from flies and dust. All these principles, except adequate food protection from flies and dust, were relatively more common among food vendors in Dormaa-Ahenkro than those in Bibiani. In contrast to this, though the use of head protection as well as dishing out food with appropriate kitchenware were higher among food vendors in Dormaa-Ahenkro, there was no statistically significant association ($p > 0.05$) with the study locations (Table 3).

The study generally revealed very good compliance with medical examination (C-score = 0.91) and provision of water at vending point (C-score = 0.90); good compliance with cleanliness of fingernails (C-score = 0.79), use of appropriate kitchenware for dishing out food to consumers (C-score = 0.74) and marginally good compliance with training on food hygiene and safety (C-score = 0.61) among the food vendors (Figure 2). Compliance with all these food hygiene and safety principles was relatively higher among food vendors in Dormaa-Ahenkro than Bibiani. According to FAO/WHO [30], the provision of water at food vending points is necessary to ensure that food vendors have access to water for washing hands and used bowls regularly. Moreover, the use of bare hands in dishing out food to consumers, as observed among a little more than a quarter (26%) of all food vendors coupled with unclean finger nails (21%) raise public health concerns. This is due to the fact that, the hands and finger nails serve as harbourages for pathogens and possibly result in cross contamination of food upon contact [24, 34].

Average compliance with protection of food from flies and dust (C-score = 0.55) and head covering (C-score = 0.45) were observed from the study while compliance with use of protective clothing (C-score = 0.38) was poor (Figure 2).

Meanwhile, the FAO/WHO [30] recommends that food handlers should ensure protection of food from all forms of contamination including flies and dust, and wear suitable protective clothing and head covering. The observed levels of compliance with head covering and use of protective clothing is in line with the findings of Nurudeen et al. [24] who found less than 50% compliance with these food hygiene and safety principles. Overall, compliance to the 8 selected food hygiene and safety principles was marginally good (OC-score = 0.67) and was relatively higher among food vendors in Dormaa-Ahenkro (OC-score = 0.71) than Bibiani (OC-score = 0.62).

Sanctioning of food vendors for non-adherence to local food hygiene and safety bye-laws was generally low in both study areas. Overall, only 2% of food vendors, all located in Bibiani, reported ever being sanctioned by a Health Officer (Table 4). Meanwhile, Bibiani had relatively lower compliance with the selected food hygiene and safety principles. Statistically, there was no significant association ($p = 0.056$) between sanctioning of food vendors and the study areas perhaps indicating no association between sanctioning and compliance.

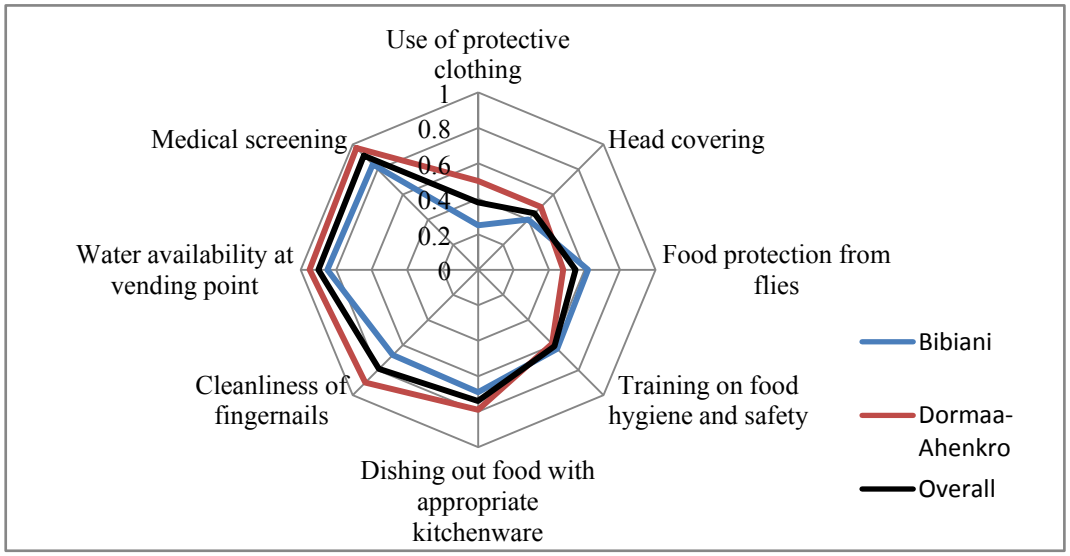

Figure 2. Radar diagram of compliance scores

Table 3. Education on food hygiene and safety and registration of business

Food hygiene and safety principles	Variables	Bibiani	Dormaa Ahenkro	Overall
		%	%	n (%)
Training on food hygiene and safety (p = 0.562)	No	37	41	78 (39)
	Yes	63	59	122 (61)
Medical screening (p = 0.002)*	No	16	3	19 (9.5)
	Yes	84	97	181 (90.5)
Head covering (p = 0.155)	Absent	60	50	110 (55)
	Present	40	50	90 (45)
Condition of finger nails (p = 0.000)	Clean	68	90	158 (79)
	Unclean	32	10	42 (21)
Protective clothing (p = 0.000)	Absent	75	50	125 (62.5)
	Present	25	50	75 (37.5)
Water provision at food vending point (p = 0.018)	No	15	5	20 (10)
	Yes	85	95	180 (90)
Adequate food protection from flies and dust (p = 0.047)	No	38	52	90 (45)
	Yes	62	48	110 (55)
Means of dishing out food (p = 0.107)	Bare hands	31	21	52 (26)
	Laddle/ spoon	69	79	148 (74)

*P value obtained from Fisher's exact test

Table 4. Sanctioning of food vendors and common illnesses experienced

Study parameter		Bibiani	Dormaa-Ahenkro	Overall n (%)
Sanctioning of food vendors	No	95	100	195 (98)
	Yes	5	0	5 (2)
Commonly experienced illnesses	Musculoskeletal disorders	1	0	1 (1)
	Coughs	0	4	4 (2)
	Coughs and headaches	4	1	5 (3)
	Headaches	21	6	27 (14)
	Malaria fever	1	0	1 (1)
	Common cold	0	4	4 (2)
	Waist pains	5	0	5 (3)
	None	68	85	153 (77)

When asked about the common illnesses experienced, only less than a quarter (23%) of all the food vendors reported experiencing various sicknesses often times. These reported illnesses were usually dominated by headaches only (14%) in both study areas while musculoskeletal disorders (1%) and Malaria fever (1%) constituted the least experienced illnesses among the food vendors. According to Esena & Owusu [19] headaches fall within the symptoms of non-typhoidal salmonellosis and typhoid fever which are both categorized under bacterial food borne diseases and is thus a cause for concern.

Moreover, despite the generally low prevalence of coughs and sneezes associated reportedly experienced by the food vendors, studies have shown that these illnesses can easily spread pathogens from one person to another [35, 36]. Education and constant monitoring of food vendors are therefore needed in this regard to ensure that food vendors do not sell food to the public while experiencing these illnesses.

3.2. Institutional and Legislative Framework for Ensuring Food Safety in Ghana

Ensuring food safety anywhere on the face of the globe requires appropriate legislations and adequately resourced institutions to enforce these legislations. Against this background, Ghana has over the years developed quite a number of legislations and allocated various institutions to ensure the hygiene and safety of food from farm to fork, as widely reported in literature [37-39]. However, it appears from the findings of this study and other similar studies carried out in Ghana that, these legal instruments as well as institutional frameworks for ensuring food hygiene and safety have not achieved the desired effects. For the purpose of this study, the review of institutional and legislative framework is limited to only the institutions and legislations responsible for regulating the activities of food vendors.

Institutionally, responsibilities regarding inspection and regulation of the activities of food vendors are shared among the Food and Drugs Authority (FDA), under the Ministry of Health (MOH); the Environmental Health and Sanitation Units (EHSUs) of the Municipal, Metropolitan and District Assemblies (MMDAs), under Environmental Health and Sanitation Directorate (EHSD) of the Ministry of Local Government and Rural Development; the Ghana Tourism Authority (GTA), under the Ministry of Tourism and Diaspora Relations (MTDR); and the Environmental Protection Agency (EPA), under the Ministry of Environment, Science, Technology and Innovation [38, 40] (Figure 3). At the national level, all the legislations on food hygiene and safety are passed by Parliament of Ghana (PoG) with the assent of the President. Meanwhile, at the local level also, MMDAs are constitutionally recognized as the local authorities and have legal mandate to enact bye-laws regarding food hygiene and safety. Both the FDA and the GTA are mandated to register and inspect catering enterprises while the EHSUs of MMDAs are tasked with the oversight responsibility of protecting public health at the local level. The EHSU therefore, as part of their responsibilities, also conduct food premises inspections and monitor medical examination status of food vendors as part of their work.

All these institutions also carry out education and training sessions independently for food vendors across the country and their efforts in this regard are complemented by the Ghana Traditional Caterers Association (GTCA); a union of food vendors in Ghana. GTCA has more than 500,000 registered members scattered across the country and organises capacity building workshops for their members from time to time with the support of the Skills Development Fund (SDF) and Council for Technical Vocational Education Training (COTVET) programme [41, 42].

Indeed, statistics show that, in 2013, the FDA carried out 18 training sessions to educate street food vendors on food hygiene and safety for almost 3,000 food vendors nationwide while there is evidence of training sessions carried out by the Environmental Health and Sanitation Units in the various MMDAs, GTA and GTCA for food vendors across the country as well [37, 38, 42, 43]. Without a stretch of imagination, it becomes obvious that there is duplication of responsibilities and vaguely defined roles. This has the propensity to result in waste of resources and consequently hamper effective monitoring of food vendors due to lack of coordination among these institutions.

Regarding scope of operations, the FDA and GTA are limited to only the ten regional capitals of Ghana while the EHSUs have offices in all the 216 MMDAs across the country, including the regional capitals. The members of the GTCA are also spread through more than 32 districts across the country, mostly in 6 out of the ten regions in the country, namely, the Central, Volta, Brong Ahafo, Western, Eastern and Greater Accra Regions.

This clearly indicates an overlap of scope of operations among these institutions. Additionally, an analysis of the staff strength of the EHSUs and the FDA indicates that the former (3,122 personnel) has about 5 times higher human resource capacity than the latter (627 personnel) [37, 44]. Therefore, the limited nationwide presence coupled with the low staff strength of the FDA together make it impossible for the authority to carry out large-scale monitoring of activities of food vendors across the country.

This is corroborated by the fact that only 16 routine premises inspection were conducted by the FDA between 2012 and 2013 across the country as reported by the most recent annual report of the Authority [37]. Evidently, the EHSUs in the various MMDAs have the capacity, in terms of human resources, to effectively monitor the activities of food vendors in contrast to the FDA.

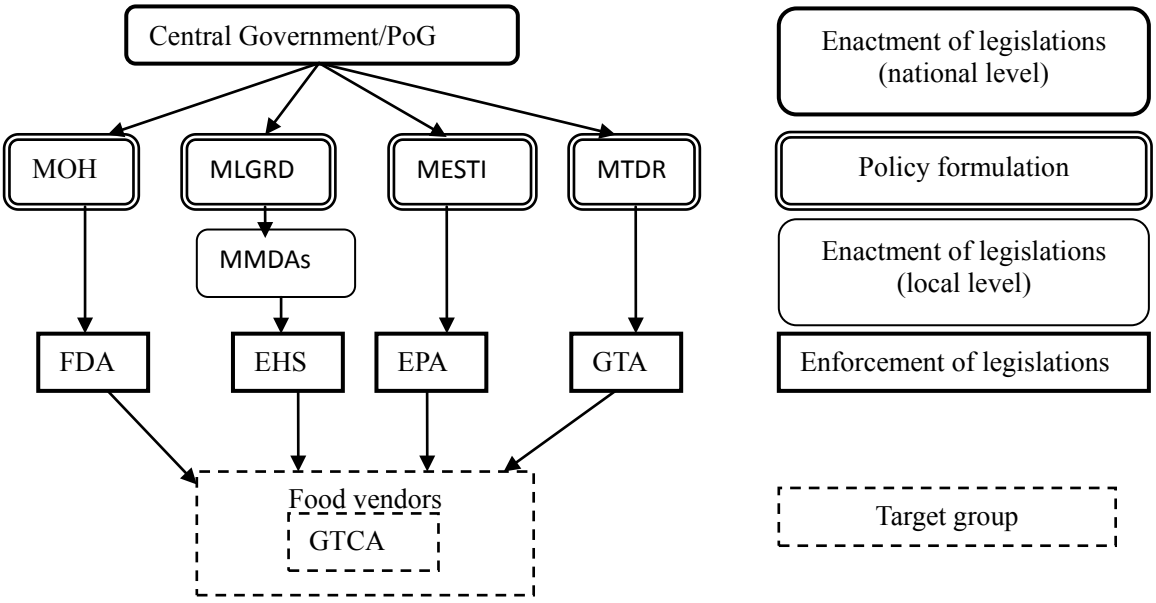

Figure 3. Ghana's institutional framework for ensuring food safety at the fork (Authors' construct)

Further, the EPA, among its numerous functions outlined by the EPA Act 1994, is mandated to regulate the import, export, manufacture, distribution, sale and use of pesticides. In relation to this, the Act stipulates that "a person shall not harvest or offer for sale a foodstuff on which pesticides have been used except in compliance with the prescribed practices including the interval between the application of pesticides and the harvest". By this, the EPA is clearly being empowered to regulate the sale of foodstuffs by food vendors to ensure that they conform to the pesticides control and management principles as outlined in the Act. According to the Public Health Act, the term "food vendor" refers to a person who sells food to the public. It fails to specify whether it refers to those selling raw (uncooked) foodstuffs or those selling already prepared meals. The role of the EPA in monitoring food vendors is therefore vaguely defined by the EPA Act 1994.

Worse still, although consumers play a major role in ensuring food safety, as Ajayi et al. [45] argues, no specific roles have been stipulated for consumers. There is no means provided for consumers to channel their complaints through to appropriate authorities for action as well as educating the public on the requisite food hygiene and safety principles among food vendors. It is therefore imperative that consumers become well-informed on best practices for food hygiene and safety among food vendors in order to bring to the notice of authorities any observed deviations. This will help keep food vendors on their toes while complementing the efforts of health officers concurrently.

Harmonisation of institutional framework and explicit definition of the roles and responsibilities of institutions for ensuring food hygiene and safety are therefore very crucial. Clearly, the FDA and GTA are hugely constrained and does not have the capacity to effectively monitor the activities of food vendors. However, it could offer technical support to EHSUs in various assemblies in terms of capacity building workshops and training programmes to ensure that EHSUs are well-informed on modern international standards of practice in the food hygiene and safety. Food vendors should be encouraged to form groups at the national, regional, district and local levels to ensure quick dissemination of information and ease of education and training.

In 2012, the Parliament of Ghana passed the Public Health Act to revise and consolidate the laws relating to public health to prevent disease, promote, safeguard, maintain and protect the health of humans and animals and to provide for related matters [46]. Prior to that, the existing legislations were scattered in bits and pieces in numerous national legislations including the Food and Drugs Law, 1992 (PNDC Law 3058), Food and Drugs Law Amendment Act 523; Criminal Code (Amendment) Act, 2003 (Act 646); National Health Policy, 2007; Environmental Protection Agency Act, 1994; Local Government Instrument, 1995-LI 1615 and Local level bye-laws. The Public Health Act, 2012, in line with the Food and Drugs Law, 1992 (PNDC Law 3058), as amended by Food and Drugs (Amendment) Act 1996) and the Criminal Code (Amendment) Act, 2003 (Act 646), provides the standards for the sale of food and drugs and for related matters. The law criminalises the sale of unwholesome food and sale of food under insanitary conditions and provides the respective penalties for culprits. On the downside, the Public Health Act is hushed on the roles of the EPA and GTA in ensuring food hygiene and safety among food vendors although it clearly spells out those of the FDA.

Additionally, the 1992 Constitution of the Republic of Ghana recognises local authorities (MMDAs) as the highest political authority at the local level and has deliberative, legislative and executive powers. As a result, each of the 216 MMDAs across the country have their own bye-laws regarding food hygiene and safety. This leads to duplication and possibly, inconsistencies in the bye-laws for ensuring

food hygiene and safety in the various assemblies. Moreover, in local assemblies where bye-laws are not often reviewed to meet up to current practices the possibility of outdated laws being used cannot be ruled out.

In-depth key informant interview with a Principal Environmental Health Officer pointed out the fact that, the capacity of EHSUs nationwide is overwhelmed by the large number of food vendors to be monitored within their catchment areas. Though, no figures were given, the indications made it starkly clear that they are ill-equipped, in terms of human resource capacity, means of transport and logistics to ensure effective monitoring of all food vendors within their respective districts. Moreover, by virtue of the fact that their offices are located only in District, Municipal or Metropolitan capitals, their focus is mostly concentrated in these areas while other surrounding towns and villages are mostly left to their fate. Consequently, food vendors could commence operations without their knowledge, possibly selling food under insanitary conditions to the general public. Of particular concern, ambulatory food vendors were identified as being very difficult to track, considering the unpredictable nature of their movements. Moreover, lack of a comprehensive database on food vendors means tracking of vendors is a huge problem. It was indicated that, some Environmental Health Officers are demotivated in some cases to present culprits before court for legal actions to be taken against them. This is due to, among others, huge delays in the prosecution process at traditional courts, interference by political office bearers/community leaders on culprits' behalf and paltry fines eventually issued to culprits, making the legal actions ineffective in serving as deterrence. Enforcement of laws therefore becomes an issue considering all these encumbrances with their work. To address this, law courts should be specifically set aside to handle issues related to sanitation and public health in general, to fast track prosecution processes. EHSUs also need to be strengthened in terms of human resource base and logistics to be able to expand their scope of operations to all communities within their catchment areas.

4. Conclusions

The study observed an overall marginally good (OC-score = 0.67) compliance with internationally recommended guidelines for food hygiene and safety with clear disparities between the two study areas: compliance at Dormaa-Ahenkro was relatively higher (OC-score = 0.71) than Bibiani (OC-score = 0.62). The pattern of compliance levels depicts very good compliance with medical screening (C-score = 0.91), provision of water and food vending points (C-score = 0.9). However, use of protective clothing (C-score = 0.38) and head covering (C-score = 0.45) were poorly complied with. The relatively high compliance with medical screening is commendable since the health status of food vendors is very crucial in the transmission of diseases. In general, local health officials are responsible for inspection of medical examination certificates of street food vendors and failure to acquire this certificate is regarded as an offence according to local bye-laws. Statistically significant associations ($p<0.05$) were observed between all but two (training on food hygiene and safety; and means of dishing out food) food hygiene and safety principles and the study areas.

Although an institutional and legislative framework exists, it is characterised by vague definition and overlap of institutional roles, duplicated legislations, inconsistent and possibly outdated local bye-laws on food hygiene and safety. Local authorities have weak capacities, in terms of human resource and logistics to effectively monitor the activities of food vendors. Their operations are therefore limited to only few communities within their catchment areas.

The need for the development of a national food safety standards and strategic action plan for food hygiene and safety that consolidates all legislations and institutional roles cannot be overemphasized. The required standards for food hygiene among street food vendors need to be clearly defined on a national scale through the collaborative efforts of all stakeholders to serve as a point of departure for local bye-laws on food safety. The roles of all stakeholders, including consumers in ensuring food hygiene and safety, among food vendors selling cooked foods, raw foods and packaged foods need to be defined unequivocally. Intensive public education on food hygiene and safety principles required of food vendors is also a key necessity. Further studies would be required to examine the factors that account for the disparities in compliance levels with food hygiene and safety principles among the food vendors from different locations in the country.

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