

## ORIGINAL ARTICLE

### Hygiene practices among street food vendors in Tamale Metropolis

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The transmission of food borne infections is on the increase in developing countries and has been linked to the environmental sanitation, personal and food hygiene level and practices in a community. The activities of food vendors can increase the chances of food contamination with pathogenic microorganisms and mycotoxins. The study was conducted to assess the food hygiene practices among street food vendors in the Tamale Metropolis. Structured questionnaires, interviews and field observations were used to assess the age, educational standard, knowledge, food hygiene practices and environmental sanitation of 150 randomly selected street food vendors in Tamale Metropolis from those who agreed to participate. The study noted that street food business in the Tamale Metropolis was women dominated (76%). Majority of vendors (78%) were aged 20-39 years. Public toilets (pit latrines) were accessible to all vending sites. Though high number of street food vendors had some form of formal education (66%) and knowledge of food hygiene (62.7%) certain practices associated with the services, such as not washing hands with soap (12%), serving cooked food with bare hands (38%) and low participation in medical examination (46.7%) are unacceptable. Street food vendors in Tamale Metropolis need regular health education on standard environmental, personal and food hygiene practices and strict enforcement of environmental and food hygiene regulations to keep street food safe for consumers.

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#### INTRODUCTION

Food borne illnesses have become major concern in developing countries, particularly with increase in out-of-home feeding. Street foods are ready to eat foods sold on the street. They are accessible, affordable and have become the major source of food for most people, especially the low income earners and the unemployed (Campbell-Lendrum *et al.*, 2007). High demand for cheap, ready to eat food on the street, high unemployment and relatively cheap to operate mostly using local technology have compelled many people predominantly women in developing countries into street food business (Campbell-Lendrum *et al.*, 2007).

The street food industry has been growing steadily

in developing countries for its economic and socio-cultural importance (Campbell-Lendrum *et al.*, 2007). This women dominated business is informal, usually small, not registered and unregulated (Campbell-Lendrum *et al.*, 2007). Most operators in the business lack formal education and basic knowledge of standard food hygiene practices, and the foods sold are prepared, handled and processed using traditional methods with no attention to hygiene standards (Campbell-Lendrum *et al.*, 2007). From the way the street food industry operates, contamination of street food with transmissible pathogens is inevitable (Campbell-Lendrum *et al.*, 2007). Street food vendors are generally uninformed of good food hygiene practices (Mensah *et al.*, 2002; Tambekar *et al.*, 2009). Their activities can increase the risk of food contamination with pathogens, and have been linked to outbreaks of diarrhoea diseases in developing countries (Mensah *et al.*, 2002; Tambekar *et al.*, 2009). They have no knowledge of their personal health status and may

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be infected patients or carriers of transmissible pathogens (Mensah *et al.*, 2002). Cholera outbreak has become an annual affair in certain parts of Ghana and environmental sanitation and activities of street food vendors have an important role to play since the situation is enhanced by contamination of food with the pathogen which is of faecal origin. The spread of faeco-oral pathogens in a community has been linked to the personal hygiene and sanitation in the community (Mensah *et al.*, 2002). In some communities ready to eat food is served with bare hands increasing the risk of food contamination.

Bacteria and parasites that do not require an intermediate host to become infective have been the major causes of food contamination and microbial food infection. Bacteria implicated include *Vibrio cholera*, *Salmonellae*, *Shigella*, *Staphylococcus aureus*, *Bacillus cereus*, while parasites with an incidence of 50 million and 100,000 deaths include *Giardia duodenale*, *Ascaris lumbricoides*, *Hymenolepis nana*, *Trichuris trichuira* and *Enteramoeba histolytica* (Mensah *et al.*, 2002; Idowu *et al.*, 2006).

Cooked food is a good source of nutrients for pathogenic microbes. Infective forms of these pathogens are able to survive the temperatures at which these street foods are sold and the generally high temperatures of the environment under study favour the rapid proliferation of microbial pathogens in such foods. The control of pathogenic microbial infections, especially those of faecal origin will depend on the knowledge of factors contributing to their infection (Mensah *et al.*, 2002; Idowu *et al.*, 2006). Regular medical screening for food vendors to trap infected vendors and carriers for treatment are often ignored by street food vendors due to ignorance, high cost and lack of commitment on the part of authorities to enforce food safety regulations, unlike vendors in institutions who are compelled to undergo medical examination and provide a certificate of fitness to operate. The proliferation of street food joints with increased patronage and role of these foods in social functions in the Tamale Metropolis have called for the investigation of food hygiene practices of street food vendors as a basis for the formulation of a sustainable public health education

programme for food handlers to make street food safe and reduce the spread of food-borne illnesses in the Metropolis. This study was conducted to assess the level of food hygiene practices among street food vendors in the two Sub-Metros of the Tamale Metropolitan area.

## MATERIAS AND METHODS

### Study area

Tamale is the regional capital of the Northern Region of Ghana located between latitude 9° 16' and 9° 34' North and longitude 0° 36' and 0° 57' West in the Savannah wood lot. Climate is tropical continental with temperatures between 21° in the night and 32° C (Yakubu *et al.*, 2014). Tamale Metropolitan Area comprises two Sub-Metropolitan Areas, Tamale Central and Tamale South and has a land size of 646.9 sq. Km, a population of 223,252, with 111,109 (49.7%) being male and 112,143 (50.2%) being female (2010 PHC). The residents are predominantly Dagomba with other ethnic groups from other parts of the country. The predominant religion is Muslim.

### Survey method

The target population was street food vendors selling ready to eat food on the street of Tamale South and Tamale Central. The project was explained to the food vendors and some of those who consented were randomly selected. Structured questionnaires on age, sex, educational background, knowledge, attitude and practices in relation to food hygiene, interviews for information on food handling and medical examination were carried out from May, 1 2014 to 31 May 2014. Personal observations were conducted on vending sites for environmental sanitation.

### Statistical analysis

Environmental and personal data relating to food hygiene collected by questionnaires, interviews and observation were analysed using the Statistical Package for Social Scientists (SPSS) and expressed in percentages. Significant differences between the two sub-metros were separated by the p-value at 5% significant level. Results were said to be signifi-

cantly different if the p-value was less than 0.05 ( $P < 0.05$ ).

## RESULTS

Street food vendors are on the increase in Tamale due to high patronage from low income earners for its affordability and acceptability. The food is gaining centre role in the numerous social functions in the area and being cheap to operate provides ready employment to many unemployed youth especially women, most of who may be unaware of their own health status and standard food hygiene practices.

One hundred and fifty (150) street food vendors participated, 75 from each of Tamale Central and Tamale South. The ages of respondents ranged from fifteen (15) to sixty (60) with majority of vendors 117 representing 78% in the age range of 20-39 years (Table 1).

Sex distribution of the 150 street food vendors sampled showed that both males and females were engaged in the industry with females population 115 representing 76.7% higher than that of males 35 (23.3%). Respondents indicated three ways food was dispensed to costumers, using bowl (14.11%), ladle (47.3%) and bare hand (38.7%) with Tamale central recording higher vendors (41.3%) using bare hands to serve food than Tamale south 36.0% (Table 2).

Vendors with child care activities were 25 (16.7%) with no significant difference ( $P > 0.05$ ) between Tamale South and Tamale Central. (Table3). All participants responded operating near public toilet (Pit latrine) facilities with non-operating his/her own toilet facility. A high number of participants had formal education, 99 (66.0%). No significant difference

**Table 1: Age distributions of participating street food vendors**

Age (years)	Number (n)	Percentage (%)
16-19	7	4.7
20-24	30	20.0
25-29	30	20.0
30-34	29	19.3
35-39	28	18.7
40-44	14	9.3
45-49	2	1.3
50-54	10	6.7
Total	150	100.0

**Table 2: Sex distributions and food hygiene practices of participating street food vendors**

Variables	Tamale South, n(%)	Tamale Central, n(%)	Total, n(%)
<b>Gender</b>			
Male	16(21.3%)	19(25.3%)	35(23.3%)
Females	59(74.7%)	56(78.0%)	115(76.7%)
<b>Mode of food service</b>			
Hand	27(36.0%)	31(41.3%)	58(38.7%)
Ladle	37(49.3%)	34(45.3%)	71(47.3%)
Bowl	11(14.7%)	10(13.3%)	21(14.0%)

( $P > 0.05$ ) was observed in the number having formal education in Tamale South and Tamale Central. Ninety four (94), representing 62.7% respond-

**Table 3: Personal and environmental hygiene data of street food vendors: Number (%)**

Parameter	Totals (%)	Tamale south	Tamale central	P-value
Total vendors with child care activities	25(16.7%)	13 (17.3%)	12 (16.0%)	0.828
Toilet facility: All near public toilets (Pit) but none with own toilet facility				
Total Vendors with formal education	99(66.0%)	49 (65.3%)	50 (66.7%)	0.864
Vendors with Medical examination certificate	70 (46.7%)	33 (44.0%)	37 (49.3%)	0.516
Total Vendors with knowledge of food hygiene	94 (62.7%)	41 (54.7%)	53 (70.7%)	0.043*
Hand washing with soap	132 (88.0%)	67 (89.3%)	65 (86.7%)	0.618

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ed had knowledge of food hygiene and were aware of disease transmission through contaminated food. However, vendors from Tamale Central with knowledge of food hygiene were significantly higher ( $P < 0.05$ ) than those from Tamale South. One hundred and thirty two (132) representing 88% practiced hand washing with soap after visiting the toilet. Patronage for medical examination was low with only 70(46.7%) having medical examination certificate.

### DISCUSSION

The street food industry has become an area of global concern because of the high health risk associated with the highly patronised street foods among low income earners in developing countries. Poor environmental, personal and food hygiene practices are responsible for the high rate of food borne illness in developing countries. Street food vendors in developing countries are often ignorant about standard food hygiene practices and serve as vehicle for the dissemination of pathogenic microbes and mycotoxins through contaminated foods (Campbell-Lendrum *et al.*, 2007). Outbreaks of food related illness in developing countries are often traced to food vendors and handlers whose activities increase the risks of consumers contracting infections (Campbell-Lendrum *et al.*, 2007).

One hundred and fifty (150) street food vendors in the Tamale metropolitan area were randomly sampled for the assessment of food hygiene practices. Female population was higher 115 (76.7%) than that of male 35 representing 23.3%. These results are in agreement with Choudhury *et al.* (2011) who reported that women dominate in the food vending industry. Assob *et al.* (2013), also reported higher number of females in street food vending than males in Cameroon. Lues *et al.* (2006), concluded that street food vending is a common income generating venture of women in developing countries and that woman are often owners and employers in the industry.

The age of street food vendors in Tamale ranged from 15-60years with most vendors (78%) in the age bracket of 20-39years. The results are in agreement

with Monney *et al.* (2013) who observed that most (50%) school food vendors sampled in Konongo (Ghana) were aged 25-35years. Vendors with child care activities were 25 (16.7%) with no significant difference ( $p > 0.05$ ) between Tamale South and Tamale Central. All participants responded operating near public toilet (Pit latrine) facilities with non-operating his/her own toilet facility. A high number of participants had formal education, 99 (66.0%). No significant difference ( $p > 0.05$ ) was observed in the number having formal education in Tamale South and Tamale Central. Formal education and knowledge of food hygiene tend to promote good understanding and practice of good environmental, personal and food hygiene among food handlers. Ninety four (94), representing 62.7% responded having knowledge of food hygiene and aware of disease transmission through contaminated food. However, number of vendors from Tamale Central with knowledge of food hygiene was significantly higher ( $p < 0.05$ ) than that from Tamale South.

One hundred and thirty two (132) representing 88% practised hand washing with soap. This is in agreement with Ackah *et al.* (2011) who reported a high number (96%) of respondents' practised hand washing with soap in Accra. Higher percentage in Ackah *et al.* (2011) than current observation could be due to strict enforcement of food hygiene regulations by school authorities. Medical examination has not been well patronized with only 70 representing 46.7% haven undergoing regular medical examination. The results are in agreement with Ackah *et al.* (2011) who reported that only 40% of food vendors in Accra had medical certificate. Musa *et al.* (2001), also reported low patronage of medical examination by street food vendors in Accra.

According to their report thirty (30) out of 141 representing 21% had medical certificate suggesting that the low patronage of medical exam could be blamed on lack of commitment on the part of state agencies to enforce food hygiene regulations. In another survey, 60% of food vendors interviewed in Accra had no medical examination certificate (Musa *et al.*, 2001). Respondents indicated three ways food was dispensed to costumers, using bowl

(14.11%), ladle (47.3%) and bare hand (38.7%) with Tamale central recording higher number of vendors, 31 (41.3%) using bare hands to serve food than Tamale south 27 representing 36.0%. The practice of using bare hands to serve ready to eat food had a higher potential to increase food contamination especially when hand washing with soap is not a common practice even after visiting the toilet.

### CONCLUSION AND RECOMMENDATION

The study concluded that street food vending was women dominated business, with a few males. Some street food vendors responded having child care activities which could increase the chance of contaminating their food with foodborne pathogens from the child. The population of street food vendors with formal education and knowledge of food hygiene practices was high in the Tamale metropolis. That probably informed the high number of vendors practising hand washing with soap. However that fraction not practicing hand washing with soap could still pose significant danger to the community.

Medical examination as a good food hygiene practice recorded low patronage despite the high number of respondents having formal education and knowledge of food hygiene. Whatever reason that could have been assigned to this attitude, lack of commitment on the part of the appropriate state authorities to enforce the necessary food hygiene regulations should be blamed, since food vendors in institutions like schools have been reported to undergo periodic medical screening as a requirement to operate. Serving ready to eat food with bare hands as noted in the study is a bad food hygiene practice that can increase the chances of food contamination. Regular health education, periodic medical examination for street food vendors and handlers, and strict enforcement of standard environmental, personal and food hygiene practices will help eliminate these poor practices and make street food safe for human consumption.

### COMPETING INTERESTS

The authors declare that they have no competing interests.

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