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Assessment of hygienic and food handling practices among street food vendors in Nakuru Town in Kenya

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Abstract: Withstanding the test of time, the precarious working condition; and the ministry of public health and sanitation not acknowledging their existence, street food vendors continue to feed more than 50% of the urban population. Whether illegally into the market system or not, the reality is that the unsuspecting public continue to put itself at risk by consuming foods that are not monitored. It is from this background that the study sought to assess the hygienic and food handling practices of the street food vendors in Nakuru town. The aim of this paper is to empower the general public especially those who consume street foods. The study population was all street food vendors. The target population was all street food vendors who cook and sell cooked foods on the street, while the accessible population was all street food vendors who meet the inclusion criteria within Nakuru central business district. A cross-sectional study design was used. A sample size of 384 was arrived at by use of Fischer's et al, 2008, formula. The study employed cluster sampling design (Mugenda et al, 2003). The central business district was then clustered into four quadrants and proportionate sampling was done. A sampling frame of street food vendors was developed from each cluster and randomly sampled to identify the required number of respondents, (Mugenda et al., 2003 and Ahuja et al., 2006). Both qualitative and quantitative data was collected. Pre-tested and standardized structured questionnaires and observation checklist were used. Data was analyzed using Microsoft-excel and SPSS version 17 and presented descriptively. The findings showed that 83% had a cleaned their workplace, 54% of the vendors handled money and food indiscriminate, 44% had dust bins and 73% of respondents did not have their hair covered. The study recommends the concerned stakeholders to promote sanitation among the vendors.

Keywords: Street Food Vendors, Food Hygiene, Food Handler's Hygiene, Street Food Contamination

1. Introduction

More than 40% of Nairobi residents consume street foods, while in Nakuru town, its 50%**,** (Mwangi et al., 2002). Consequently, there has been a marked increase in morbidity of consumers of street foods and street food vendors are thought to be the source if not the cause of increase in food borne disease outbreaks, (Falkenstein, 2010). Majority of food borne disease outbreaks result from inappropriate food handling practices (Jones et al, 2006). Food handlers play an important role in food safety and in the occurrence of food poisoning because they may introduce pathogens into food during preparation (Green et al., 2005 and Lillquist et al., 2005). Food handlers are carriers of enteric pathogens, (Oteri et al., 1989; Taylor et al., 2002 and Shojaei et al., 2005). Food poisoning affects hundreds of thousands of people each year and cause deaths, (Minas, 1998; Lindquist et al., 2000; Atanassova et al., 2001; Borch et al., 2002; Haziriwala, 2002; Lynch et al., 2006 and Debess et al., 2008). The unsanitary operating conditions questions the quality and safety of foods they serve is highly contaminated, (Obuobie et al., 2006). Due to poor environmental temperature it makes it a health risk to the consumers, (Granahan, et al., 2001). For many foods especially those that are sold ready-to- eat, the cleanliness of food contact surfaces have been identified as critical to food safety (Moore et al., 2002). Food poisoning outbreaks mostly occur when cooked foods are handled by persons who carry the pathogen in their nares or on their skin, (Protocarrero et al., 2002). This finding indicates the potential of an explosive food poisoning situation. Studies have indicated that high prevalence of diarrhoeal morbidity is caused by not washing of hands after defecation, not washing hands before cooking

and buying prepared foods from the street food vendors. These findings are consistent with other studies conducted in Ghana (Benneh et al., 1993; Shier et al., 1996; Mensah et al., 2002; Boadi et al., 2005) and other African countries (Thomas et al., 1999; Roberts et al., 2001; Kung'u et al., 2002 and Taylor et al., 2002; Shojaei et al., 2005). Hygiene and related risk assessment should be approached as social phenomena based upon culturally determined ideas. Dirt-avoidance was a desirable behaviour long before the discovery of bacterial disease transmission, thus hygiene is not only about the removal of germs (Curtis, 1988). Similar findings are documented in Ghana, dirt is seen as much more than a potential health risk and can be equally perceived as physical and moral decay, whereas cleanliness stands for physical and moral attractiveness – in Ghanaian English cleanliness is often referred to as 'neatness', a term indeed often appearing in local street-food surveys, (Geest ,1998). The revelation from a study in Kenyatta National Hospital concluded that opportunities for contaminating food existed amongst all the sample food handlers mostly due to their negligence on some of the vital hygiene practices.

2. Methodology

Table 1. *Proportionate distribution of representative units as per cluster*

Cluster	Number of SFVs	Representative units
Cluster A	1367	96
Cluster B	997	70
Cluster C	1239	87
Cluster D	1865	131
Total	5468	384

Cross sectional descriptive study design was employed. The study population was all street food vendors within Nakuru town central business district. The target population was street food vendors who cooked and sold ready to eat foods within Nakuru town central business district The inclusion criteria was street food vendors who cooked/prepared food on street or at home and had been in business for more than six months were included in the study. The exclusion criteria were street food vendors who were not selling cooked foods, but snacks, fruits, vegetables. Street food vendors who met the selection criteria but had only been in business for less than three month were also excluded from the study. Study Area is Nakuru town central business district was the area of the study. It is centrally located in Nakuru town which is 160 kilometres north-west of Nairobi. Nakuru town is the fourth largest urban centre in Kenya after Nairobi, Mombasa and Kisumu. It is also the fastest growing town in Africa making it appropriate for the study. For Sample Size determination, since the population of interest was not known, the study adapted the standard Fischer's et al, (1998) formula where p=0.5, as elaborated by Mugenda, 2008 to arrive at the desired sample size

n =sample size

z =Standard deviation which corresponds to confidence interval (1.96)

p = Proportion of study units

d = Degree of accuracy, (0.05).

Formula is $n = Z^2 pq/d^2$

$n= 1.96^2 \times 0.5 \times 0.5/ (0.05)^2$

$n = 3.8416 \times 0.25/0.0025$

$n = 384$

For the Sampling Methodology, the study employed cluster sampling design, (Mugenda et al., 2003 and Kombo et al., 2006). The town was clustered into four quadrants by use of two main roads, Kenyatta and Moi road. From each quadrant, proportionate sampling based on the number of street food vendors in each cluster was done to get the number of respondent. A sampling frame of street food vendors was developed from each cluster and randomly sampled using random tables to identify the required number of respondents, (Mugenda et al., 2003 and Ahuja et al., 2006). Data collection tools; for Quantitative data was by use of structured questionnaire and observation checklist while qualitative data by use of key informant interview guide.

3. Findings

3.1. Vendors Putting on Aprons

The study sought to find out whether the vendors were dressed up to the task. The findings showed that majority of the vendors 235 (63%) had aprons while 138 (37%) did not have approve as indicated in the figure below.

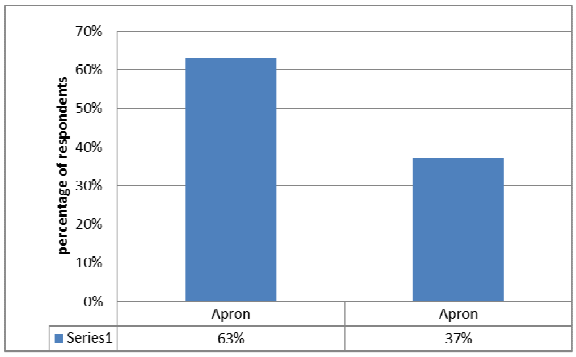

Figure 1. *Respondents putting on apron*

3.2. Water Source

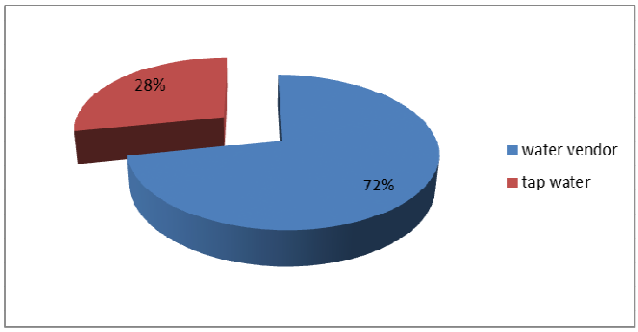

Figure 2. *water source*

Water and sanitation has been closely associated with diarrhoea. It is from this background that the study sought to find out the source of water for the respondents. The findings

showed that 269 (72%) of the respondents got their water from vendors while 104 (28%) claimed tap water.

3.3. Separate Container for Drinking Water

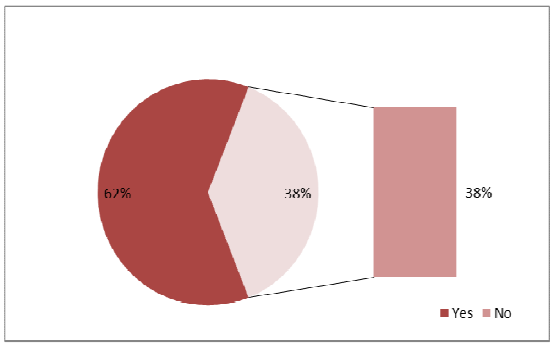

Figure 3. *Presence of a separate container for drinking water*

Handling of drinking water is paramount in prevention of it from being contaminated. From the study, 231 (62%) had a separate container for drinking water while 142 (38%) did not have separate containers for drinking water.

3.4. Treating of Drinking Water

Much as most of the respondents claimed to have a separate container for drinking water, further analysis showed that 217 (58%) did not treat their drinking water, at least 153 (41%) treated drinking water with 44 (12%) claiming to boil it while 29% used water guard.

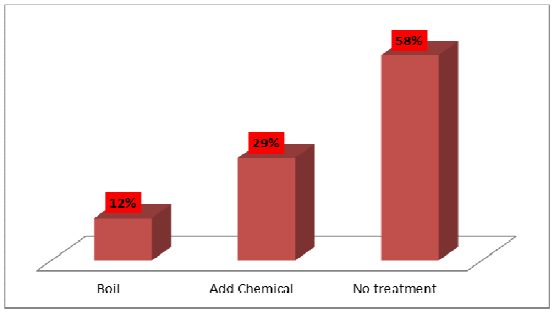

Figure 4. *Water treatment*

3.5. Hand Washing before Food Preparation

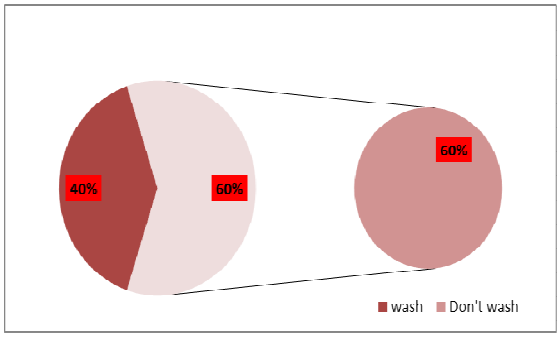

Figure 5. *Respondents wash hands before preparing food*

The researcher sought to find out whether the respondents washed their hands prior to food preparation. This is from the background that most foods are contaminated during the time of preparation and hands can introduce the contaminants. The findings revealed that most 224 (60%) of the respondents claimed to wash their hands prior to food preparation against 149 (40%) that did not wash their hands.

3.6. Hand Washing with Soap and Water

On further analysis on how the respondents washed their hands, 190 (51%) claimed not to use soap but only water while 183 (49%) said they used soap and water. Nevertheless, the study revealed that 258 (69%) used water on a vessel or pail so that it can be re-used for washing utensils against 115 (31%) who used running water using a jag to pour it.

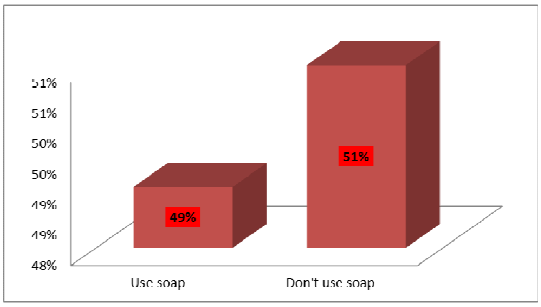

Figure 6. *Respondents use soap to wash hands*

3.7. Covering of Food

The study found out that most of the respondents covered their food during preparation; with 302 (81%) claiming to cover it against only 71 (19%) who claimed not to cover their food during preparation.

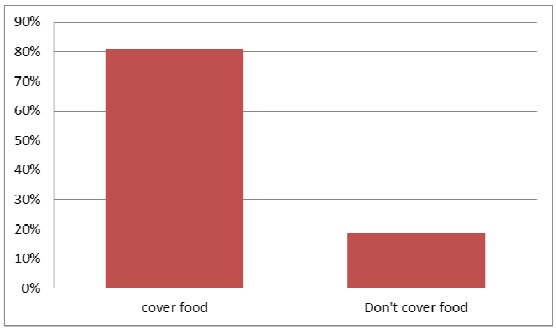

Figure 7. *Respondents cover food when preparing*

3.8. Food Serving

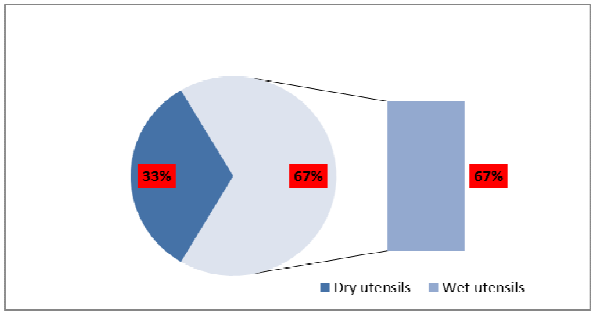

Figure 8. *Food served on dry utensils*

The study found out that 33% of the respondents served food on dry utensils while 67% on wet utensils.

3.9. Temperature of Food being Served

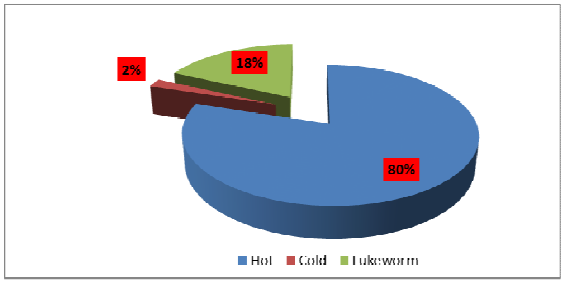

Figure 9. *Temperature of food served*

On further analysis, most of the vendors 299 (80%) served food when hot while others 7 (2%) and 67 (18%) could serve cold and lukewarm as they could carry already cooked foods from their homes

3.10. Food Storage

Most foods that are not well handled pose a danger to the consumers. Most of the vendors 258 (69%) do not sell all the foods they prepare and 227 (95%) of them store for re-sell the following day. At least 11 (5%) said that they consume or throw away the remains. On further analysis, 203 (83%) of street food vendors store food at room temperature while 36 (14%) store in a refrigerator.

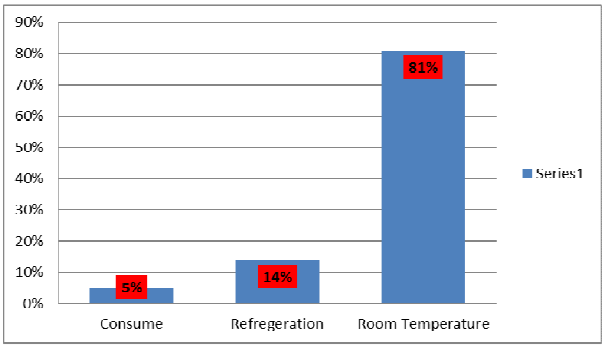

Figure 10. *How the respondents keep their left over*

The study sought to find out the cleanliness status of the vending place. The findings showed that most of the vending places were clean 287 (77%) while 86 (23%) of the vending places were not clean.

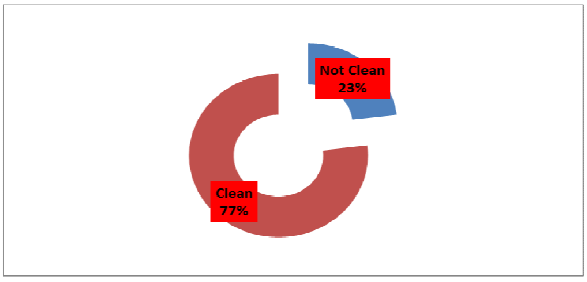

Figure 11. *Clean vending place*

3.11. Formal Training in Food Handling

Analysis on whether the vendors had undergone any food preparation and handling training, the study found out that 314 (84%) had not undergone any formal training in food preparation while 59 (16%) claimed they had undergone formal training in food preparation.

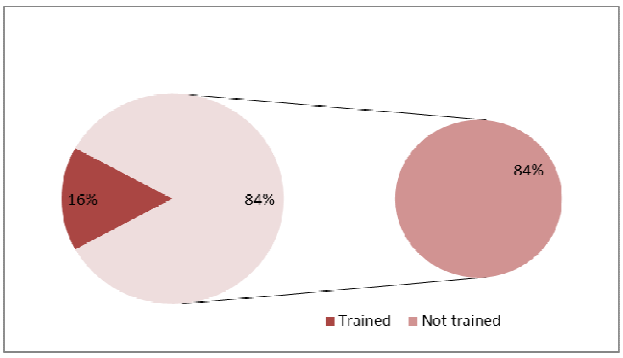

Figure 12. *Respondents trained in food handling*

3.12. Food Contamination

The study sought to find out the respondents awareness on food contamination. Majority 235 (63%) of the street food vendors claimed they could contaminate food while a considerable proportion 138 (37%) claimed they could not contaminate food.

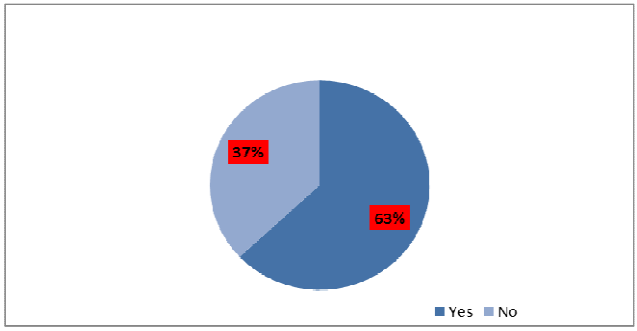

Figure 13. *Response on whether they can contaminate food*

3.13. Mode of Disease Transmission

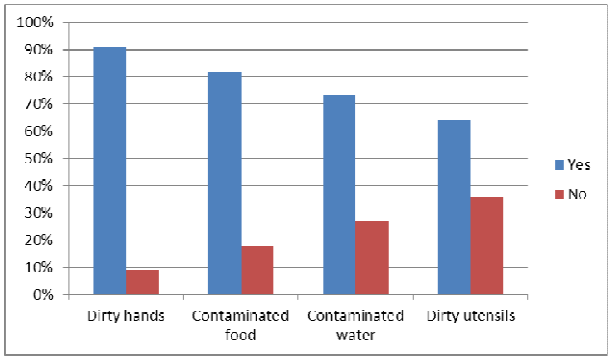

Figure 14. *Mode of disease transmission*

On further analysis on the means of transmission of diseases, 340 (91%) said they could through dirty hand while

33 (9%) claimed they could not pass disease through dirty hands. On whether one can pass the disease through contaminated food, 306 (82%) said they could against 67 (18%) who claimed they could not pass the disease thought contaminated food. On whether they could pass disease through contaminated water, 273 (73%) of the respondents claimed they could while 100 (27%) said they could not. On whether the respondents could pass the diseases to the consumers through dirty utensils, 239 (64%) claimed they could against 134 (36%) who said they could not.

4. Discussion and Conclusion

Most of the study findings about street food vendors not washing hands prior to food preparation are with consistent with (Falkeinstein,2010; and Jones et al, 2006) which stated that food handlers play an important role in food safety and in the occurrence of food poisoning because they may introduce pathogens into food during preparation. This has also been echoed by (Green et al., 2005 and Lillquist et al., 2005). The respondents have revealed that the respondents can pass diseases through food contamination, water contamination, dirty hands and dirty utensils. These findings concur with studies that have indicated that high prevalence of diarrheal morbidity is caused by not washing of hands after defecation, not washing hands before cooking and buying prepared foods from the street food vendors. These findings are consistent with other studies conducted in Ghana (Benneh et al., 1993; Shier et al., 1996; Mensah et al., 2002; Boadi et al., 2005) and other African countries (Thomas et al., 1999; Roberts et al., 2001; Kung'u et al., 2002 and Taylor et al., 2002; Shojaei et al., 2005). As much as most 287 (77%) of the vending places were clean, it is important to mention that a considerable proportion 86 (23%) of the respondents were operating in unhygienic conditions. The findings were consistent with (Obuobie et al., 2006). That stated that the unsanitary operating conditions questions the quality and safety of foods they serve is highly contaminated. Majority 302 (81%) of the vendors store left over foods at a room temperature. The findings are consistent with (Granahan, et al., 2001). That said due to poor environmental temperature it makes it a health risk to the consumers. Furthermore, a considerable number proportion 67 (18%) of the respondents claimed to serve food on wet utensils. The findings concur with other studies that have indicated that for many foods especially those that are sold ready-to- eat, the cleanliness of food contact surfaces have been identified as critical to food safety (Moore et al., 2002).The revelation from a study in Kenyatta National Hospital concluded that opportunities for contaminating food existed amongst all the sample food handlers mostly due to their negligence on some of the vital hygiene practices. The findings are consistent with this study in essence that vital practices like covering food, treatment of drinking water washing hands with soap in running water, have been also compromised. However it is necessary to mention that 269 (72%) of the respondents has water vendors as their source of water. Where the water vendors get the water is not well not, a anecdotes has it that some get the water form public toilets.

Recommendations

Policy

- The public health act (1980) of food, drug and chemical CAP 242 of laws of Kenya to be reviewed by the ministry of public health and sanitation to include street food vendors into the market legally. This will provide a legal mechanism of monitoring what they serve the public.

Programme

- The concerned stakeholders to carry out health education programme in order to empower the street food vendors in basic hygienic and sanitary practices
- The general public to be educated In order to be vigil in assessing what they consume for their own safety
- Formal training and certification of street food vendors in to qualify them to handle food consumed by the public
- The concerned stakeholders to ensure public accessibility of clean water. Just like access to public toilets so shall there be access to public water.

Research

- Accessibility to safe water supply in Nakuru Town.
- The role of eating culture in proliferation of street food vending in Nakuru town.

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Biography

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