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Original Research Article

HANDLING AND STORAGE PRACTICES OF FOOD COMMODITIES RETAILERS AT OPEN MARKETS IN GHANA

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Abstract: The handling and storage of food commodities at the open markets quite often pose challenges to consumers because that is the only or primary source of purchasing foods from retailers. This paper is based on investigations into food selling practices in Ghana at three open markets (Accra, Cape Coast, and Kumasi) to assess the challenges faced by retailers in the handling and storage of their wares. The research used observation and interviews to investigate food handling and storage practices. In all, food commodity retailers (n= 45) were observed and interviewed from February to July, 2014. The major findings highlighted lack of proper storage facilities as the basic challenge faced by the women involved in the sale of food commodities. While the women who sold protein foods had limited space in deep freezers for storing their items, vegetables and fruits were stored in baskets, sacks and cupboards. Strategizing Government and Private Organizations to find a lasting solution to the proper storage of food commodities by operating commercial cold/ chill room facilities for open markets in Ghana is important. Offering training support to both retailers and stakeholders in food handling practices as a means to prevent the outbreak of food borne diseases positions the concept for researchers and serves as the best practice that can be applied in West African countries.

Key words: Food commodities, open market, food-borne diseases, retailers, consumers, food handling, food storage

Introduction: The proper handling and storage of food commodities has the potential of decreasing food-borne diseases (Feglo & Sakyi, 2012; Chattopadhyay, 2007) and increasing the quality of life of consumers (Pamplona-Roger

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Accepted after revision: January 2015 Downloaded from: www.johronline.com 2012). The training given in food handling practices and food safety for retailers of food commodities similarly should be geared towards the provision of safe and nutritive food (Barro, Bello, Itsiembou, Savadogo, Ouattara, Nikiéma, De Souza, & Traoré, 2007; Carter, 2009) more than making profit (Johns and Pine 2002). The literature asserts that open market sellers engaged in both processed and fresh foods are called retailers (Massachusetts Department of Public Health, 2013). It has been documented that although food is known and accepted as a

basic need (American Dietetic Association, 2002; Meiselman, 2006), large losses occur from the farm to the plate through poor handling practices: distribution, storage, and purchasing behaviours (Khader, 2004; Food & Agricultural Orgnisation (FAO), 2014).

Food nutrients are easily lost through improper handling and storage techniques and promote the favourable conditions (such as moisture, and the right temperature given the suitable food and convenient time) for bacteria growth (Higgings, 2002; Mensah, Yeboah-Manu, Owusu-Darko&Ablorde, 2002).

Proper adherence to high standards of both personal and food hygiene during their handling and storage is often required (Okoronkwo, Udensi, & Nwaigwe, (2014) at all stages of food production (Feglo & Sakyi, 2012): from the farm to the table (Lee, 2004), to prevent food poisoning (Howard, 2003). This is because, food poisoning continues to be one of the menaces facing consumers and often causes undue anxiety among the populace in the event of an outbreak (Roberts, 1999; FAO, 2014). It is also known that to offset such incidences of foodborne diseases (Kennedy, Jackson, Blair, McDowell, Cowan, & Bolton, 2005) such as cholera and the recent Ebola menace, it is vital to offer training to enhance personal, kitchen and food hygiene during the handling and storage of food (Barro et al, 2007; Rahman & Arif 2012; Feglo & Sakyi, 2012).

In Ghana, the favourable conditions for the growth of food poisoning bacteria tend to be available (Mensah, Amar-Klemesu, Hammond, & Haruna, 2001; Soyiri, Agbogli, &Dongden, 2008; Feglo & Sakyi, 2012). Market areas are mostly not enclosed (Hoffman, Dennmis, Gilliam, & Vargas, 2005), and very few shops sell food commodities required for daily cooking. While the market offer consumers the opportunity to purchase food items, most of these products exampled by tomatoes, fish, vegetables and fruits chicken. are sold instead uncovered of applying hygienic packaging (Hoffman et al, 2005).

Commodities such as protein foods when stored in hygienic modes will not affect the quality but can maintain its original status (Zhao, VIllena, Sudler, Yeh, Zhao, White, Wagner, & Meng, 2001; Berkel, Boogoard, & Heijen, 2004), prevent food hazards and risks (Yeboah-Manu, Kpeli, Akyeh&Bimi, 2010), and provide adequate and nutritious meals for consumers (Vaclavic& Christian, 2010). In the case of selling fresh food commodities, personal and food hygienic practices become paramount (Koistaluk&Kopan, 1997; Berkel et al, 2004). How food is delivered, handled before and after storage is of utmost importance in ensuring food safety (Roberts, 1979; Rosati&Saba, 2004). The quality of food commodities is often compromised in situations where poor refrigeration/ freezing methods and or facilities exist (Mehas& Rodgers, 1997; Lee, 2004).

In Ghana as in other countries, authors have delved into issues on microbial contamination particularly on street food vending (Mensah, Owusu-Darko, Yeboah-Manu, Ablordey, Nkrumah & Kamiya, 1999; 2001; 2002; Umoh&Odam 1999; Kubhekar, Mosepye, & Von Holy, 2001: Ghosh, Wahi, & Ganguli, 2007; Feglo & Sakyi, 2012); prevalence of foodborne illness among school children (Olukoya, Bakare, & Abayomi, 1991; Kwakye-Akyea, 2007).

Alongside these authors, United Department of Agriculture (USDA), fact sheets and the National Food Safety Database consistently provide research reports on food handling and safety issues (Child Care Advocate Program, 2001; USDA fact sheets, 2014). A global congress held in Germany on the theme, 'Save Food' could only highlight Nigeria as the West African country (Food and Agricultural Organisation (FAO), 2014), thereby giving indications of not much published data about Ghana. Barro et al, 2007 and Feglo & Sakyi, 2012's studies recommended the use of training in handling and safety practices for food retailers operating along the roadside as a strategic positioning for preventing microbial growth and limitation of food borne illnesses.

However, very little research has been conducted on the food handling practices and storage at market spaces (Hoffman *et al*, 2005;

Massachusetts Department of Public Health, 2013) and virtually none in Ghana which equally has hygienic challenges that could pose threats to human health (Mensah *et al*, 2001; Soyiri *et al*, 2008; Okoronkwo *et al* 2014).

This paper therefore finds it vital in the objective of this research to investigate the handling practices and food storage techniques used by food commodities retailers operating at the open markets in Ghana from three regions (Accra, Cape Coast and Kumasi) to find out if there are similar or different challenges facing retailers in the country.

Methodology

A qualitative methodology was used, namely interviews and observations in order to enhance an in-depth information that this study sought for specifically about the methods adopted by food commodity retailers used for storing their items as well as the handling practices used.

Study area

The study was conducted in three different places: Accra Kaneshie market, Cape Coast Abura market, and Kumasi Kwadaso market taking a representative sample. These three towns are regional capitals with very brisk business activities at the various market spaces. Accra is the capital city of Ghana, Cape Coast is notable for the numerous tourist activities in the region which has world acclaimed heritage sites, and Kumasi usually called the garden city is also very popular for its cultural tourism and social activities. Kaneshie, Abura, and Kwadaso are popular open market spaces where majority of people visit purposely to shop because of the availability and moderate prices of food commodities. These market places were found suitable for generalisation because they had similar characteristics as the other open markets in the country. They sell almost everything sold in the other regions including the items under investigation.

Population and sample

The selection was purposive to get those involved in the sales of perishable food commodities. The target population was the food commodities retailers in the three open markets, specifically those who dealt in the

selling of perishable food items: meat, vegetables, fresh and smoked fish, and fruits. The sample was all females in the age range of twenty-five to forty-five years. This age range was chosen to facilitate the study which required the knowledge base of food retailers on the basic principles of hygienic handling and storage of food commodities being sold to the public. Majority within the selected age range were therefore considered as literates engaged in active economic business in the market. The group was expected to be familiar with the different methods of handling and proper storage of food commodities.

Data collection at each market place started with a period of observation at the sales points which included the storage space. General details such as type of commodity, the quantity sold and stored, the hygienic practices (personal and storage space) and storage facility available were documented. An interview schedule was devised for the retailers at the three open markets which, asked about the perishable items on sale to the public, the types of storage facilities available, quantities of commodities stored, mode of storage, knowledge in hygienic practices.

Findings

While the observation notes were cumulated, the interview data were analysed for attitudes towards the handling of perishable food commodities and storage techniques at the open markets. They were evaluated for pattern and meaning in order to identify emerging themes. Coding was effected and raw narratives included during the discussion to authenticate the results. The emerging themes included reasons for particular commodity, selling the food knowledge base of hygienic practices, ways of handling foods sold, storage practices in the specific open markets, and proposed facilities required for storage of foods sold in the open markets.

Accra market

Observation: The market is a very large storey building, popular and busy which looked congested with buyers and retailers. It had small shops built within for majority of the women

who sold varied goods. A number of retailers had small tables in front of their shops where part of their goods was displayed. Others had only tables with their wares displayed.

The perishables such as fresh vegetables, and fruits had no specific place and were located at different parts of the market. Frozen, salted and smoked foods like fish and meat were also found at different areas of the market. Retailers were also located not only within the market but around the market place with their food commodities. This practice made it quite difficult to enter the market without brushing past another person.

Majority of the food retailers displayed their commodities on tables of varying sizes. Others displayed theirs on large wooden trays either on the tables or for hawking within and mostly outside the market. Except for the kiosks outside the main building which had deep freezers, it was observed that the fish and chicken retailers had their fresh commodities packed in ice chests with ice blocks on them. Few of these food commodities were displayed on tables which were replenished when finished. There were signs of complete defrosting of these food items on the tables.

Majority of the retailers used their bare hands to pick and package their food commodities for consumers. Hands were either washed in water or were cleaned after each sale with a napkin or suitable cloth used for that purpose. The chicken were cut into desired sizes upon request while scales were removed from the fresh fish and packaged appropriately for consumers after the selling and buying process. The smoked fish were similarly displayed on table tops in different sizes. Fruits and vegetables were arranged on tables.

Both fruits and vegetables were seen in large quantities in either baskets or sacks and the smoked fish were in baskets. There were no visible signs of plastic storage containers with lids at the sides of tables of these market women. There were cold rooms inside the market for the frozen foods.

Interview: fifteen perishable food commodities retailers: (smoked and fresh fish, chicken, fruits,

and vegetables were interviewed at the Accra market. Initially, they were reluctant to talk about their operations at the open market but after the initial introduction and assurance of confidentiality, they opened up.

Reasons for selling particular food commodities

Almost all of them perceived the selling as a business entity that was being undertaken to support themselves and their families financially. They were not very particular about where and when to sell because of survival.

It was evident that all five retailers of perishable food commodities had no apparent reason for selecting what to sell but all shared similar reasons for displaying their items at any available space:

"......I need money to take care of my children so I have to find any available place to sell my things, - Vegetables Seller.

'.....I have to feed my family and also pay their fees, I have no choice of place' Fruits Seller

'.....we are always being driven from one place to the other...any place you see free you just put your things and sell' - Smoked fish Seller

Knowledge on hygienic practices

In view of the food items being sold to the public by the respondents, all agreed that they had adequate knowledge about hygienic practices. They knew the different methods used in preserving food. Their perception on hygienic practices was quite elusive:

'.....ao, as for hygiene, we all know about it...it means washing hands after whatever you do and cleaning the surrounding to keep it clean' – (Retailers)

Handling practices of Food Retailers

In order to offset the incidence of food poisoning and or health hazards there is the critical need for every market area to carry out certain activities for the proper storage of food commodities. Generally, the commodities retailers were of consensus about their perceived knowledge in the proper handling practices of foods sold to the public:

'.....we always keep our hands clean and wash them frequently'in fact we know how to handle our foods to make sure that those who buy don't fall sick' – Vegetable Seller.

Storage of Food

Additionally, these retailers explained that they were not into any big business but always bought an amount that could be sold within the shortest possible time to prevent having to store their food items. The fact that they were not allowed to sell outside the market space and were scared of being sanctioned for selling at those places encouraged them to rely on those who had freezers in their shops. Apparently, those inside the market had the storage facilities and acted as wholesalers for those retailing outside.

Although the women agreed that they always sent their unfinished items to those who had the cold rooms; it was evident that the fruit and vegetable retailers kept theirs outside the cold rooms:

'.....I keep my meat in the fridge upstairs'-Chicken Seller

'.....as for that one, I don't have a problem since there are many rooms with refrigerators where I can easily put my left over things covered in a bowl' – Fresh fish Seller

It was obvious the retailers had differences in storing their commodities after the sales:

".... I send them up and keep them in a friend's room' - Fruits Seller

For some of them the best way was to devise their own means of storing their items:

" I have my own place where I keep my items' - Vegetable seller

:.... well the fish is smoked so I don't have to put them in a fridge,I wrap them up and leave in the basket - Smoked fish Seller

Concerning policies governing the proper storage of perishable food commodities particularly the meat and fresh fish, the freezer owners were of consensus that they maintain their cold temperature by keeping their freezers closed most of the time; this was to also prevent the possible health hazards:

".....I can't be opening and closing the fridge; '......as for the fridge, I cannot allow you to look inside'; '.... It is not done' '.....you know that the food is for many people so doing that will spoil my work' - Freezer owners

Generally, Ghanaians hold varying perceptions about both raw and processed food commodities: opening or taking a look into someone's food could stop the person from eating her food. From the researcher's view, it was evident that the women who owned the freezers were a bit superstitious about allowing people get first-hand information about their storage facilities by checking the temperatures in the deep freezers:

'.....oh am very sorry but I cannot open my fridge for you to see inside because I don't know what you can put in it to spoil my food - Owner of freezer

Additionally, the scare of being fined by health inspectors made them reluctant to allow the researcher to view the inside of the freezers.

The women indicated that the foods stored in the freezers were safe for consumption despite the rampant power cuts.

"..... "no, no, no, 'eei', why should I do that?';
".... are you coming from the food and drug board?';
"....or you are an inspector?';
"....don't worry, the, food is very safe to eat'
Freezer Owners

Proposed storage

In order to streamline the storage of food across market areas nationwide, there exists a critical need to install a range of storage facilities for open markets in the country. The consensus among both retailers and the owners of the freezers was to find possible ways commissioning adequate cold and chill storage rooms and or spaces to ensure the proper storage of every item sold in the market. All interviewees agreed that the inclusion of government machinery and stakeholders in developing storage facilities was a possible way of contributing to the proper storage of food commodities in the country. In summary, interviewees perceived the need for intensive training for market retailers of food commodities in the handling and storage of food items to promote food safety issues and a better health agenda to forestall the outbreak of food related diseases such as cholera.

Cape Coast market

Observation: This market has a smaller space with cement and wooden structures for the retailers. Majority of the retailers were in the open space with few in the shops and wooden constructions and not congested with buyers and retailers. The marketing strategy is however similar to that of Accra. In the context of this research, it was observed that those engaged in the sales of perishable items did so in the market space with the items displayed on table tops. In a similar way, the perishables such as fresh vegetables, and fruits had no specific place and were located at different parts of the market. Frozen, salted and smoked foods like fish and meat were also found at different areas of the market. Only one person sold slaughtered animals in a small wooden structure which had a medium sized deep freezer. In contrast, this market had easy access to its areas of food sales in relation to movement within the market.

Hawking of food items was visible also within this market while few traders had their commodities by the road side.

Aside the meat seller, the researcher did not observe any fridge or deep freezer owner in the market area. Majority of the women who sold fresh fish had big pans as their storage facility with iced blocks and sacks to protect the fish from spoilage. Few of these food commodities were displayed on top of the lid of the pans which served as the table for selling the fish. Food retailers at Cape Coast also used their bare hands to pick and process the fresh fish for their buyers.

The fruits and vegetables were arranged on tables with no indication of being washed prior to sales. The smoked fish were similarly displayed on table tops in different sizes. The vegetables were seen in sufficient quantities in either baskets or sacks and the smoked fish were in either pans or baskets. There were no visible plastic storage containers with lids at the sides of tables of these market women. The observations revealed that majority of the retailers had a constructed cupboard about the size of a table which was mostly used as the storage space after the daily sales.

Interview: in Cape Coast, fifteen perishable food commodities retailers: (smoked and fresh fish, chicken, fruits, and vegetables were similarly interviewed. They showed signs of disinterest that did not deter the interviewer from conducting the research. After completing the first interview, the seller involved encouraged the others to participate.

Reasons for selling particular foods

The perceptions of the traders were similarly on survival:

'......I am selling at this place because I need money to do what I have to do' – Food Seller.

At the Cape Coast market the women were particular about their selling areas and were into specific trading businesses as a matter of choice rather convenience as was the case in Accra. It was evident that there were not many young ones involved in the business particularly those selling the fresh fish. Unlike Accra, these market women were not being harassed for sitting wherever they chose to do for selling their foods. This made them more stabilised to do business which was not as brisk as in Accra.

Knowledge on hygienic practices

The retailers were of consensus that they had been in the trading business for quite some time and perceived they had control over their businesses though these women seemed to be not too conscious about the handling and storage of their foods. All five interviewees held the belief that there was not much to worry about food hygiene:

'.....we don't have any problem with our food here'; '.....we know how to keep our food well'; '......I don't think the way am selling can cause any trouble for those who buy'- (Food retailers)

Handling practices of Food Retailers

The food commodities retailers at the Cape Coast market did not contribute much on this issue. As they kept smiling and giving the indication that all was right with their hygienic practices:

'......I keep my food very well and it is safe for human consumption'this is how we have been selling all along and there has never been any problem with our food' - (Food retailers)

Storage of Food

In contrast to what was happening in Accra, the commodities retailers at this market were of the opinion that they did not have too much items to have them worried over how to store but it was evident that they could have left over from the daily sales. Although the fresh fish retailers were certain about full daily sales, the smoked fish retailers agreed that there was the possibility of having some amount of stock left which were kept for the next day:

'......there are times when we cannot finish selling our food and have to cover them in baskets or boxes with old newspapers and sacks for the next day' - Smoked fish Seller

Generally, the chicken and fresh meat retailers handled and kept their products similarly to what was done in Accra. The fruits and vegetables were left in boxes at the selling points. The Cape Coast market food commodities retailers all agreed that they require some form of training to support their existing knowledge in food handling practices acquired basically from the home.

They were also of consensus that the market needed to have proper storage facilities where they could keep their wares:

'.....it is a good idea to have good places to keep our things, ...at times its very tiring to carry your items to the house and back the following day because you have to put them in a fridge' – Fresh fish Retailers

Proposed Storage

The women could not come out with specific facilities required for storage except for mentioning fridges

'.....the government should give us fridges which are big to contain things for every person who sells things at this market' — Food Retailers.

Kumasi market

Observations:

Observations at this market revealed that it had a well-structured facility for the retailers. The building had inbuilt shops at two sides within and outside for different categories of retailers, which included tailors and seamstresses. Not much was done in terms of selling food outside

the main area. There was some bit of hawking within and outside the market building which was sited very close to a Church building. All kinds of food commodities were on display on tables as was shown in the two other markets under investigation. This market seemed somehow more organised regarding the siting of various commodities. A shopper could easily move to different parts of the market and get particular items all arranged in their different types and sizes. This made shopping quite easy and fast. Those selling the meat did not have freezers as they were also in their allocated spaces at one side of the building. They had two tables: one for keeping the slaughtered animals and the other for cutting and serving their customers. The retailers stood between the two tables. The space of this market was bigger than the Cape Coast one and smaller in comparison to the Accra market. In some instances retailers were observed with gloves while selling but majority used their bare hands to serve their customers. Additionally, it was observed that the age range was very diverse since children school going age were found among the retailers. There was no issue with having to run here and there as happens in Accra to prevent being arrested for selling at unauthorised places. The shops had refrigerators and deep freezers some of which were engaged in renting out business for those who required them for their commodities.

Interview

Another fifteen retailers were interviewed in similar ways to assess their modes for handling food commodities being sold to the public.

Reasons for selling particular foods

Generally, the majority of the retailers at this market had engaged in particular trades because their parents and or part of their family members were involved it. Others had been handed over to them as a family business which had to be preserved:

'.....my mother used to sell these items but now she is old and I have to take over from her' – Food Seller.

Their perception was that it was a good venture which they found very comfortable to do despite their inability to move up the educational ladder. They were of consensus that they had a choice to support consumers' needs and they could organise their accounts very well.

Knowledge on hygienic practices

The retailers all agreed that hygiene was very important and had adequate knowledge for keeping themselves and their surrounding clean. Their major concern was the lack of some amenities which could facilitate their hygienic practices:

'.....it will be better to have places of convenience built for us with hand washing basins so that we don't have to share with the people from the houses around us' – Food retailers

Handling practices of Food Retailers

Invariably, retailers of food commodities at the Kumasi market perceived they employed sustainable practices in the handling of food items to keep them very well. They were of consensus that their inability to do so could let them loose their customers:

'.....if we don't handle our foods in a hygienic manner nobody will come to buy from us' – Fish Retailers

Storage of Food

It was highlighted in their interviews that storage of food commodities was a necessary aspect of their business which demand not only putting in place a strategy for storing their foods but making sure that the temperature are controlled to prevent food spoilage which will incur financial losses:

'.....in all aspects of food storage, one thing that stands out clearly is the space and temperature of the storage facility' – Food Retailers

Furthermore, the interviewees were introduced to the idea of finding suitable storage facilities for their items being sold in the market. This research's interest in the challenges of hygienic ways or the proper way for storage was made known to the retailers.

Proposed Storage

The issue of storage facilities was perceived by all interviewees in Kumasi as complex due to the nature of business they were engaged in. The consensus among the participants was the absence of adequate food storage facilities which had adverse effect on their commodities.

They however proposed similarly in an appeal form to the government to support their businesses by building large storage rooms for them. They agreed specifically on facilities for both fresh and dry stores:

'.....we cannot say we have enough...if you look around you can see that we are many and we need more than what is available now – Food Seller

'......the government should come and help us to build more rooms for all of us to store our things the right way' – Food Seller

Varying reasons were given such as the mode of doing business which was predominantly family-based as a factor for making acquisition of storage facilities quite difficult. They agreed to have qualified personnel visit them regularly for training purposes in the handling as well as the proper storage of the foods.

Discussions and Conclusions

In proposing a conscientious building of adequate storage facilities for food commodities sold at the open markets this research additionally supports authors on the issue of more conceptual consideration of hygiene food handlers nationwide training for (Feglo&Sakyi, 2012). It was common practice for the retailers to engage in any available food commodity they found as suitable consumers. The findings showed that though majority of food retailers at open markets may have knowledge about microbial attacks on food, they still require education on the proper handling to ensure that food eaten is safe as proposed by Omari, (2008). Again the study confirmed previous research conducted by other authors in Ghana on practices adopted for handling food before selling, during sales and after sales which showed the potential of foodborne illnesses exampled by the outbreak of cholera that is often associated to unhygienic practices exampled by using the bare hands in picking and selling food items (Mensah et al, 2002; Feglo&Sakyi, 2012). The results suggest that open markets are sources of food contamination that can cause harm to consumers

who patronise the purchasing of food commodities.

Furthermore, the study presents storage facilities for the markets as inadequate for the numerous traders found which creates an opportunity for food contamination as suggested by the literature (Lee, 2004).

The incorrect ways of displaying food items such as arranging on table tops and keeping the rest in baskets, plastic or metal bowls, confirms the findings of Feglo&Sakyi, (2012)'s study in Kumasi and at Ashaiman by Soyiri et al, (2008)'s respectively on the possible contamination through their selling behaviours. Similar to Okoronkwo et al, (2014)'s findings, there were concerns about acquiring efficient storage facilities for every food commodity to prevent food spoilage organisms from growing. This is because the idea of fish being smoked or had very little effect on wholesomeness after prolonged storage in baskets and cupboards (Okoronkwo et al, 2014). The study gives the impression of lack of adequate storage facilities required to maintain the correct keeping of food commodities in the open markets where most raw food items are purchased. Generally majority of the food retailers had minimum knowledge in food hygiene and therefore used their perceived knowledge about the concept to operate their various businesses. This study observes that Ghanaian market spaces has a critical need for the provision of proper storage facilities adequately positioned at vantage areas within the markets to support what is currently available. In conclusion, this study reiterates previous studies' proposals for food hygiene education for all personnel engaged in food production and marketing including adopting the use of hot water for washing foods prior to sales (Mensah et al, 2002; Kwakye-Akyea, 2007; Feglo and Sakyi, 2012; Okoronkwo et al, 2014). It further recommends that such training programmes should be earmarked for all food providers: both raw and cooked items that can be backed by certification as done in the developed countries. In academia, emphasis should be laid on enforcing proper methods for handling and storage of foods, including the use of HACCP alongside the production and storage processes. Additionally, the results suggest the urgent need to source funding from government and non-governmental organizations to facilitate the provisions of chill and cold rooms that has adequate capacity to hold food items sold at open markets.

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