

What risks may food vendors in urban areas expose the Ugandan population to?

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This rapid response was prepared by the Uganda country node of the Regional East African Community Health (REACH) Policy Initiative.

Key messages

- Food vending services in low income countries are growing fast due to the matching growing urban poor population, for whom they provide conveniently placed and affordable food.
- They are a cause for concern due to the risks they might expose the population and environmental to, associated with:
 - the vendors' behavioural trends including poor hygiene, both personal and during food preparation
 - the general environment in which they operate
 - a general lack of knowledge and formal training in catering or food vending issues
 - social issues like child labour and a lack of government regulation
- Consumer trends and perceptions may also place them (the consumers) at risk



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Who requested this rapid response?

This document was prepared in response to a specific question from a policy maker in Uganda.

! This rapid response includes:

- **Key findings** from research
- **Considerations about the relevance** of this research for health system decisions in Uganda

X Not included:

- Policy or practice related recommendations
- Detailed descriptions

What is SURE Rapid Response Service?

SURE Rapid Responses address the needs of policymakers and managers for research evidence that has been appraised and contextualised in a matter of hours or days, if it is going to be of value to them. The Responses address questions about arrangements for organising, financing and governing health systems, and strategies for implementing changes.

What is SURE?

SURE – Supporting the Use of Research Evidence (SURE) for policy in African health systems - is a collaborative project that builds on and supports the Evidence-Informed Policy Network (**EVIPNet**) in Africa and the Regional East African Community Health (**REACH**) Policy Initiative (see back page). SURE is funded by the European Commission's 7th Framework Programme.

www.evipnet.org/sure

Glossary

of terms used in this report:

www.evipnet.org/sure/rr/glossary

Background

Street foods, sometimes also referred to as street-vended foods are foods (and beverages) prepared and/or sold by vendors in streets and other similar public places for either immediate consumption or consumption at a later time without further processing or preparation (1). What is referred to in the term is a wide variety of ready-to-eat foods and beverages including fresh fruits and vegetables.

Street-vending of food is a very common phenomenon in low and middle income countries with an estimated 40% of the urban poor in these countries consuming the food (2).

Developing countries are experiencing socioeconomic changes resulting from and in turn leading to, a very fast growth in rural-to-urban migration. There is therefore a growing urban poor population which is characterised by high unemployment rates and limited work opportunities, low compensation levels for salaried and wage earners, limited social and supportive programmes. This population and others served by the street food vending (workers, shoppers, and travellers) are motivated by the relatively low prices and the convenience of its location rather than by its safety, quality and hygiene; thus they meet needs that are not met by the formal sector (3). Street foods also offer a nutritionally balanced meal, especially if the consumer is enlightened and can therefore ask for the right foods. However, research has shown that although that is the case, with urban diets being more varied and including more amounts of animal protein and fat, rural diets may be more superior in terms of calories and protein intake (4).

The urbanization and population growth is expected to continue and therefore the street-vended foods, which are largely but not exclusively an urban phenomenon, will in turn expand accordingly. Furthermore street food vending will flourish benefiting from an obvious positive cash flow, the ability to often evade taxation, and the flexibility stemming from the fact that the vendors can determine their own working hours. In addition, street food vending is a major source of income, especially for women who may require low capital investment (1). It is actually felt that its contribution to the economies of developing countries is underestimated and at times neglected when it is indeed substantial; for example in the city of Bogor in Indonesia annual sales of street foods in the mid 1980s were US\$67 million while those for stalls in Malaysia were US\$ 2.2 billion (5). Despite this, it is a

cause for concern for health administrators, quality control officials and consumer organizations for several reasons. It may be a source of harm to the general population in several ways, stemming mainly from the hygienic practices that the vendors use, and the fact that there is poor planning, coordination and regulation of these services. It is noted that safe food hygiene is difficult to enforce at street level and in fact several outbreaks of diarrhoeal diseases have been associated and linked to street food (6). Diarrheal diseases caused by contaminated and unhygienic food are among the leading causes of illness and deaths in low income countries (6).

Street food vendors in Uganda are governed by Section 281 of the Public Health Act, which spells out mandatory requirements for all eating houses, including accessible running water, toilet facilities, refuse bins and medical examination for the food-handlers. However regulation, and therefore follow up on whether these requirements are actually met is weak. And therefore the population may actually be exposed to given risks especially in terms of their health.

This brief will look at what these risks may be and where they may originate. It is based on surveys done in Uganda, and other countries of similar context, on street vending activities, among others.

How this Response was prepared

After clarifying the question being asked, we searched for local or national evidence from Uganda and countries of similar context and other relevant research. The methods used by the SURE Rapid Response Service to find, select and assess research evidence are described here:

www.evipnet.org/sure/rr/methods

Summary of findings

Vendor Behavioural Trends during the food process and associated risks

1. Vendor Behaviours including personal hygiene

It has been noted that human beings are the largest source of contamination of food (Marriot); in fact, vendors in a study by Mensah and colleagues in Ghana were found to be carriers of a variety of bacterial enteropathogens including Salmonella typhi which causes Typhoid fever (7), and so attention to the hygiene of those preparing and handling foods is paramount.

Despite the presence of clear regulations and laws at national and international level, there has been poor enforcement of these to ensure the safety and quality of street vending work. A research carried out among 160 street food stalls in the Ga district in Ghana showed that SURE Rapid Response Service

only three (1.8%) of the proprietors met the requirements for basic hygiene based on a five-point criterion (8). Aside from their personal hygiene, other practices and behaviours also do not reflect consciousness about hygiene or sanitation. For example, in a survey carried out in Nairobi, Kenya it was found that 81.3% of the vendors did not use aprons, 60% handled food with their bare hands, and 65% had their hair not covered (9). It was also noted that all the vendors handled money while serving food. Most of the vendors packed foods in polythene bags for their customers and when packing these foods, they blew air into the polythene bags to open them, a practice which can pass on some fairly harmful germs to the consumer. Also noted commonly is that handwashing is not a common practice for many of the vendors. In a study in Ghana by Donkor and colleagues, of the 127 vendors who reported using the toilet during working hours 5% of these reported that they do not wash their hands thereafter, while 3.1% only washed sometimes (10); this might actually be an underestimate due to the sensitivity of the question. Furthermore for those that washed their hands, 29% of them reported re-using the same water to wash hands on another occasion or washing utensils.

Interestingly, however, a study in Kumasi, Ghana observed that vendors know that an impression of hygiene to the consumer is important and so they ensure neat and aesthetic impressions of the vending sites but yet at the same time, ignoring messy and dirty conditions of the kitchen and its facilities at the back (6). This behavioural pattern has been described by Erving Goffman as 'impression management': When humans make an effort to strengthen and present acceptable appearances at visible front stages and keep non-presentable actions veiled back stage (11). This is risky to the consumers as it gives a false impression of the hygienic and sanitary conditions they are dealing with, and therefore do not take extra caution.

2. Procurement

In order to maximise profits the foods bought for preparation may not be the best quality there is in the market. Vendors usually opt to purchase raw materials of a lower grade because of their lower cost (1). Recent research has highlighted the low quality of vegetables sold in urban markets in Ghana, which are bought and prepared by many street vendors. For example, of a total of 180 vegetable samples (lettuce, cabbage, and spring onion) from major markets in three major Ghanaian cities, most samples had pesticide residue levels exceeding the maximum limit for consumption, and all were focally contaminated (12). Raw materials may also be obtained from clandestine dealers such as illegal slaughterers because

of the lower prices they may offer. This may introduce dangerous and harmful components right at the start of the process. They may also procure cheap foods whose storage was not very good leading to harm too. For example, in Uganda one of the common foods prepared is groundnut or peanut sauce; poor storage of this leads to colonization by *aspergillus* exposing the consumers to aflatoxins. Recent research from Makerere University in collaboration with University of Georgia shows that this may be a cause for some cancers (13).

3. Preparation and formulation

The preparation process is one through which a lot of contamination is introduced. This is quite in keeping with what were identified as the key factors in the handling of food that contributed to food poisoning outbreaks in England and Wales in the 1970s (14). These include the preparation of food long before it was served, storage at ambient temperature, inadequate cooling and reheating, contaminated processed food, and undercooking. Much of the food sold in the food vending stalls is prepared at home and then carried there. For example in a survey carried out in the different suburbs of Nairobi, 82% of vendors of *githeri* (a maize and bean casserole) and 40% of those selling sausages prepared these at home, hours before they were to be served or consumed (9). If these are not kept at the right temperatures before serving and consumption, there is a risk of contamination.

In this same survey it was also found that vendors did not wash fresh foods properly. For example, vendors who sold fish and chips washed their raw foodstuff only once while those selling fruit salads prepared the fruit salads without washing them, because they did not have any or enough water to use. Even when water is available, its quality is not guaranteed. The preparation surfaces used by the vendors were usually found with remains of foods prepared earlier and it was noted that more than one food types were prepared at the same surfaces; this could promote cross contamination. Similarly oils used for deep-frying some foods were re-used more than once and never replaced with fresh oil, giving the foods an unusual dark colour and unpleasant odour (9). In frying the oil, it is usually heated to 170-220 °C and when heated to these temperatures in the presence of oxygen (air), the oil undergoes chemical reactions such as hydrolysis, oxidation, and polymerization. In other words it changes its character. Degradation products can include free fatty acids, hydroperoxides, and polymerized triglycerides. The oil viscosity increases, its color will grow darker, and rancidity (that is the decomposition of fats, oils, and other lipids through oxidation) begins to develop. Thermal oxidation forms decomposition products which

present the most risk to our health since they remain in the oil, are absorbed into fried foods, and are then ingested. Diets high in lipid oxidation and polymerization products (found in used frying oils) are associated with cellular alteration, reduced endothelial function, as well as LDL oxidation. Furthermore a diet high in frying oil content has been shown to induce glucose intolerance in rats and the presence of excess polar compounds and polymers in the frying oils is positively associated with the risk of hypertension (15).

The safety of some foods lie in their high levels of salt, sugar or acid or low moisture content. The formulation of such foods is often critical but street-food vendors with no formal training may not be able to observe this and therefore may not pay particular attention to correct amounts of ingredients, usually failing to monitor critical limits through taste, appearance, texture, odour, mixing time, pH, and water activity, among others (1). Although some foods are prepared away from the food vending site, some vendors carry out the final preparation with cooking e.g. frying and grilling in open stalls in front of their customers. This exposure tends to inspire confidence but is a source of contamination from the open environment for example, dust on the road side. Microorganisms in the dust include helminthes or their eggs.

4. Transportation

The fact that a lot of the street-vended food is prepared far from the points at which it is eventually sold and/or consumed in the city it has to be transported there but again along with the trends of keeping the expenditure low, it is transported using wheelbarrows, bicycles, pick-up trucks and passenger taxis. In Uganda it is a common thing to see food handlers carrying food in baskets or on trays on motorcycles with only minimal covering. These modes of transportation are inappropriate for food and they expose it to contamination if not from the handler, from the vehicle of transportation and/or from the air as there is minimal cover and protection from the environment. Furthermore there is more exposure to toxic materials from the previous occupants of the vehicle used, say a pick-up truck that had earlier been used to ferry live chicken for slaughter during procuring raw materials for the food. This could be the introduction of zoonoses like coccidiomycosis.

5. Serving and Consumption

Among the food service containers are those made from plastic, metal, enamel and also disposable polythene bags. These are washed with warm soapy water, cold soapy water and on some occasions with cold water alone. Most of the time, utensils are washed using water in buckets, with rinsing being done only once and the water used repeatedly before it is replaced. The water for washing and rinsing the utensils was observed to be dirty, during the Nairobi survey (9). Food is also served from working surfaces that are on the level of the ground (16) and therefore prone to contamination by humans and rodents among others. In the study in Accra by Mensah, they found contamination in the porridge served at breakfast and as a snack and on further analysis, it was found that the contamination possibly occurred during serving with a spoon and calabash kept in a bowl of water in which the vendor washed her hands and cleaned cups and eating bowls as well (16). Serving of foods with bare hands was found to increase contamination in the Mensah study as compared to serving with a fork or spoon; this is a very common phenomenon, in fact, in this study it was being done by 36% of the vendors interviewed. It is a well known fact that enteropathogens can survive on the hands for three hours or longer (7). In some instances food is served in polythene bags, paper or leaves all of which may be sources of serious contaminants (16). The paper is usually that from office waste and of newspaper material which may have all sorts of contamination including chemical additives from ink. The leaves used may be wiped with a piece of cloth but no extra disinfection leaving a huge risk of contamination with microflorae.

6. Storage

Foods yet to be prepared and those already prepared are generally poorly stored in the street food vending business. For example in the survey in Nairobi, it was found that fish vendors placed the fish openly on their stalls, chips and mandazi vendors kept their food in cupboards next to their stalls, fruit salad was kept in open plastic bowls on the wheelbarrows in which other foodstuffs were carried, while sausages were kept in a metallic pushing cart (9). It was also noted that most of the foods were not covered exposing them to flies and dust.

Results also showed that vendors, after preparing their foods, kept and served them at ambient temperatures. Some food was not re-heated at high temperatures before serving. Food to be eaten raw like fruit salads were not kept under cold temperatures as should be.

Several of the vendors interviewed said that they usually have left-overs and store them for the following day's sale. These vendors stored left-over food in open places (26%), refrigerators (21%), and plastic containers (21%) while 16% kept them either in polythene bags or in cupboards. Left-overs stored at ambient temperatures are quite risky because safety from contamination by pathogenic organisms is not assured.

During storage it was observed that there were poor efforts in trying to avoid contact between cooked and raw foods as sometimes they are actually stored in the same area, for example in the cupboards.

General environment and associated risks

The unregulated and yet unlimited growth of these street food vending services places a strain on resources within and around the city; many of the cities in developing countries are not able to grow in capacity as fast as the services or population within them. Resources such as water and sewage systems are stretched (9). Littering is very common and there is also interference with the city planning due to congestion. Some of these services may obstruct traffic in the centers of these increasingly congested cities. They are a cause of waste accumulation in the streets and congestion of waste water drains, traffic congestion in the city especially for pedestrians, illegal occupation of public and private spaces (17)

The construction of these stalls is another cause to worry as they do not follow any plan and are usually made out of material that is not acceptable. The stalls are generally poorly constructed and are not able to give proper protection of the foods from dust and smoke from the vehicles and surrounding environment. This is consistent from the studies in Nairobi and Accra (9, 16). Dust and smoke have microbes and chemical particles that may be pathogenic if left to settle on food. Their design also makes them congested with very little space and so difficult to clean.

They may also be placed in unacceptable places, for example, next to open sewage streams or because they lack proper disposal services, may have their garbage disposal and receptacles next to them exposing the food and consumers to contamination. In the survey carried out in Nairobi, 85% of the vendors prepared their food in unhygienic conditions given that garbage and waste were conspicuously close to their stalls (9). Ninety two point five percent of vendors interviewed did not have garbage receptacles and so disposed of their garbage just near the stalls while 92% poured waste water just beside the stalls making the surroundings wet and filthy. Furthermore toilets and adequate washing facilities are usually not available in these places.

Water is usually a problem, it is not available in the sufficient quality or quantities needed (1). In the survey carried out in the urban areas of Nairobi, it was found that there was no portable water at the premises and so water had to be ferried from distances or from the homes of the vendors in 5-20 liter capacities. What was availed though was not enough for food preparation and dish washing among other activities.

Risks associated with a Lack of knowledge

Despite the Food and Agriculture Organization (FAO) recommending that every vendor and person helping out with street food undergo a basic training in food hygiene before they are licensed, so as to have the necessary knowledge and skills to enable them to handle food hygienically, the vendors are often untrained in food hygiene and sanitation, sometimes working in unacceptably poor sanitary conditions (9). Most of the street food vendors have not undergone any form of formal training in food preparation neither have they attempted to seek it. In the survey carried out in Nairobi, 61% of the vendors acquired cooking and vending skills (including the hygiene practices associated) from observation, 33.3% were taught by their parents while 6.3% gained the skills by trial and error (self taught) and none had any formal training (9). This survey explored the relationship between education and the state of the environment but found that there was no significant correlation meaning that everyone irrespective of their education level should be trained in food hygiene. This is similar to what was found in a study in Kumasi, Ghana; the findings did not suggest an effect from education on actual safer food handling practices, such as frequent hand washing, rinsing vegetables more carefully, or making an effort to keep the cooking surroundings cleaner (6). The findings actually further confirmed the need for formal hygiene education; Vendors with formal hygiene education expressed more exact and elaborate hygiene knowledge compared to vendors without any formal hygiene education (6). Research among 117 street vendors in Accra showed that despite all vendors exhibiting good food hygiene, none of them associated dirty hands with the transmission of diarrheal pathogens (16). Donkor's study showed and therefore contributes to the notion that training improves hygienic practices of the vendors (10).

Social risks and those associated with a lack of government intervention

Several social problems have also been linked to street food vending and these include child labour, and unfair competition to formal trade (17). These are actually able to go on because of poor regulation. In many cases regulation and interventions from authorities are absent or at most, very poor exposing the public and consumers to problems. Research has shown that if a community is to have the full benefits of street-vended foods with minimal risk of foodborne disease, government intervention is required to ensure that the standard of safety for such foods is the best attainable in the context of the prevailing local situation.

Consumer perspectives and associated risks

Consumers of street foods may also be part of the picture that exposes them to the risks from street foods. In the study in Kumasi, consumers were often found to choose to prioritize price and accessibility of food, and not putting much stress or emphasis on food safety (6). They relied on risk avoidance strategies by assessing neatness, appearance, and trustworthiness of the vendor which encouraged the vendors to emphasize appearance while vending and to ignore core food safety practices while preparing food.

Trust has been used to compensate for knowledge (or the lack thereof) of food risks (18). This trust as seen in the study in Kumasi is built on previous positive experiences or social relationships and not on food safety assessments. The other criterion used by almost all consumers is the price and accessibility of the food.

Several studies were done in Europe earlier focusing on non-expert perceptions and acknowledgement of food risks, such as food hygiene and contamination. These studies found that people tended to express optimistic bias toward food risks, underestimating or ignoring risks of encountering harmful effects from foods which is in keeping with other studies in which it is shown that people have a tendency of expressing illusion of control over food-related risks (14).

Consumers have also not been vigilant in assessing or advising about the risks they may be exposed to and therefore aiding the environment that might expose them to disease. During focus group discussions with consumers in studies in Kumasi, Ghana, despite basic knowledge of risks of food-borne diseases, observations showed that consumers do not request for more hygienic behaviours from vendors, in fact, consumers emphasized that they did not wish to influence the practices of vendors even though they were highly concerned about food safety (6).

Conclusion

Street food vending is a growing phenomenon in the developing world because of the benefits it comes with for the vendors in terms of being a source of income with very little capital investment and also for the consumers in terms of being relatively cheap and easily accessible. However it is a source of concern for the risks especially to the health of the population due to the poor hygienic and sanitary conditions associated with it. It is also associated with risks of other problems like city congestion and child labour all of which may thrive because of poor government intervention and regulation. The street vendors are not the only ones to blame; the consumers too have behaved in a way that gives the vendors no incentive to improve on the conditions under which they work.

References

1. World Health Organization. ESSENTIAL SAFETY REQUIREMENTS FOR STREET-VENDED FOODS. Geneva: Food Safety Unit, Division of Food and Nutrition; 1996 Contract No.: Document Number|.
2. Oyunga-Ogubi M. A., E. Okwach, N. J. Waudo, A. Makokha, S. O. Oiyee. Content and Bioavailability of Micronutrients in street foods of low income groups, Nairobi, Kenya. In: Kenya Agricultural Research Institute, editor. 12th KARI Scientific Conference; 2010. 2010.
3. Helene Delisle. Patterns of urban food consumption in developing countries: perspective from the 1980s. Rome: Food Policy and Nutrition Division, FAO; 1990 Contract No.: Document Number|.
4. United Nations. Rapid Urbanization Poses Challenge to Health, Nutrition. ADMINISTRATIVE COMMITTEE ON COORDINATION - SUBCOMMITTEE ON NUTRITION; 1988 [updated 1988; cited 2012]; Available from: www.unsystem.org/scn/archives/scnnews01/ch2.htm.
5. F. G. Winarno, A. Allain. Street Foods in developing countries: lessons from Asia. Journal [serial on the Internet]. 2008 Date: Available from: www.fao.org/docrep/u3550t/u3550t08.htm.
6. Thilde Rheinländer, Mette Olsen, John Abubakar Bakang, Harriet Takyi, Flemming Konradsen, Helle Samuelsen. Keeping Up Appearances: Perceptions of Street Food Safety in Urban Kumasi, Ghana. Journal of Urban Health: Bulletin of the New York Academy of Medicine. 2008;85(6).
7. Mensah P, Owusu-Darko K, Yeboah-Manu D, Ablordey A, Nkrumah FK, Kamiya H. The role of street food vendors in the transmission of enteric pathogens. Ghana Medical Journal 1999;33:19-29.
8. King LK, Awumbila B, Canacoo EA, Ofosu-Amaah S. An assessment of the safety of street foods in the Ga district of Ghana; implications for the spread of zoonoses. Acta Trop. 2000;76:39-43.
9. Muinde Onesmus, Kuria Elizabeth. Hygienic and Sanitary Practices of Vendors of Street Foods in Nairobi, Kenya African Journal of Food Agriculture and Nutritional Development 2005;5(1).
10. Eric S. Donkor, Boniface B. Kayang, Jonathan Quaye, Moses L. Akyeh. Application of the WHO Keys of Safer Food to Improve Food Handling Practices of Food Vendors in a Poor Resource Community in Ghana. International Journal of Environmental Research and Public Health. 2009;6:2833-42.
11. Erving Goffman. Theory of Impression Management. York University; 1959 [updated 1959; cited 2012]; Available from: www.fsc.yorku.ca/york/istheory/wiki/index.php/Impression_management,_theory_of.
12. Amoah P, Drechsel P, Abaidoo RC, Ntow WJ. Pesticide and pathogen contamination of vegetables in Ghana's urban markets. Arch Environ Contam Toxicol. 2006;50:1-6.
13. Prossy Nandudu. Poorly processed peanut butter causes cancer. The New Vision. February 23, 2012.
14. Roberts D. Factors contributing to outbreaks of food poisoning in England and Wales 1970-1979. Journal of Hygiene. 1982;89:491-8.
15. Robert J. Simon. Can reusing frying oil be dangerous to your health? Journal [serial on the Internet]. 2008 Date: Available from: www.allenfiltersinc.com/.
16. Patience Mensah, Dorothy Yeboah-Manu, Kwaku Owusu-Darko, Anthony Ablordey. Street foods in Accra, Ghana: how safe are they? Bulletin of the World Health Organization. 2002;80(7).
17. Food and Agriculture Organization. Street Foods. [cited 2012]; Available from: www.fao.org/fcit/food-processing/street-foods/en/.
18. Hansen J, Holm L, Frewer L, Robinson P, Sandoe P. Beyond the knowledge deficit: recent research into lay and expert attitudes to foods, risks. Research review. Appetite. 2003;41:111-21.



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Conflicts of interest

None known.

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