

BRINGING FOOD SAFETY TO THE SHOPPERS

IMPLEMENTING INFORMATIONAL FOOD SAFETY STANDS IN TRADITIONAL MARKETS IN NIGERIA



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SUMMARY

Reducing foodborne disease in low- and middle-income countries (LMICs) is crucial for advancing nutrition, health, and other development goals. The U.S. Agency for International Development (USAID)/Feed the Future's Evidence and Action Towards Safe, Nutritious Food (EatSafe) program sought to harness consumer demand as a mechanism to improve food safety practices and generate evidence on how to raise consumer demand for safe, nutritious foods in traditional market settings—the main source of food for most LMIC consumers. To this end, EatSafe in Nigeria tested four community interventions, including an in-market Safe Food Stand that provided consumers with food safety information, demonstrations, and trainings in the markets where they shopped. This paper reports on the results of an implementation research study that sought to understand how Stand staff and visitors perceived the intervention, drawing lessons for future similar approaches.

Across two markets, 59 people were interviewed, including all 10 Stand staff, 39 Stand visitors, and 10 shoppers who had never visited the Stand. An additional 16 observations were conducted of the Stand during its normal operations. The results showed that visitors and staff generally appreciated the intervention, seeing the Stand as a good source of food safety information, with dedicated and welcoming staff and informative materials. Cooking demonstrations were particularly appreciated. Over half of visitors reported changing their practices following their interactions with the Stand. At the same time, both staff and shoppers reported several reasons for not visiting more: a lack of time, limited visibility of the Stand, and (for some), limited interest in educational content on food safety. Recommendations for improvement in the future include placing the Stand in a more central location and developing more signage and advertising activities to raise awareness. Respondents also noted it will be important to consider ways to increase the Stand's reach and/or decrease its resource-intensity, such as through simplified events or more digital engagement.

KEY MESSAGES

- Improving food safety in traditional markets is key for improving health and wellbeing, and in many LMICs this cannot be feasibly done without the involvement of market shoppers. However, opportunities to engage LMIC shoppers on food safety topics have been limited to date.
- In Nigeria, EatSafe developed a Safe Food Market Stand to provide information to shoppers directly in the market, through staff interactions, events such as cooking demonstrations, and written materials.
- The study showed that the Stand was widely appreciated by staff and visitors, leading to reported knowledge and behaviour changes among them.
- At the same time, barriers to its greater frequentation were cited, including limited awareness of the intervention, limited time, and limited interest.
- In the future, it will be important to find ways to increase the efficiency of engagement via the Stand, in order to support its sustainability.

BACKGROUND AND OBJECTIVE

Enhancing food safety¹ in low- and middle-income countries (LMICs) is crucial for advancing overall health and well-being. The contaminants that make food unsafe – such as viruses, bacteria, moulds, protozoa, helminths (worms), physical contaminants, and chemicals – can infiltrate the food supply chain at different stages, from production to home preparation, leading to immediate illness or injury and/or increasing the likelihood of long-term, chronic diseases (2–4). Annually, foodborne diseases contribute to an estimated 600 million illnesses and 420,000 premature deaths worldwide, with a significant burden borne by individuals in LMICs (2,5,6). Foodborne disease also intersects with and exacerbates malnutrition, being both a potential cause and a consequence of it (7). Addressing food safety in settings grappling with high burdens of both foodborne diseases and malnutrition, such as much of sub-Saharan Africa, thus holds particular promise for improving nutrition and health outcomes.

Nigeria exemplifies this double burden, with 36.8% of children under age 5 experiencing stunting and 18% of them facing wasting (8), alongside 173 million annual cases of diarrhoea and about 33,000 deaths attributed to foodborne illnesses (9). Tackling foodborne diseases in Nigeria is therefore imperative, not only to address immediate health concerns but also to improve overall nutrition outcomes in the country.

Many foods in LMICs are contaminated while they are moving through the food supply chain, before reaching the end consumer (10). Traditional markets are a particularly important focal point, as they are a critical source of food for local populations (11) and can be especially risky for foodborne pathogens due to insufficient infrastructure and potable water (12), less-than-hygienic conditions (13,14), and inadequate storage practices (15). In Nigeria, prior research has found bacteria and toxins in 15%-60% of raw vegetables in traditional markets, 14%-22% of beef in abattoirs, 2%-10% of dairy products in traditional markets, and 100% of smoked fish in traditional markets (9). Though this does not necessarily entail that those who consume these foods will fall ill, it does increase the risk that they will.

While improved systems of government regulation, control, and enforcement – which generally keep food safe in high-income countries – are necessary over the long term, many LMICs, including Nigeria, have limited food safety management capacities (5,16,17). Interim solutions that take more bottom-up approaches, focusing on the consumers and market vendors who are on the front lines of food safety, are thus needed. At present, however, consumer education on food safety in LMICs is limited. Most interventions used to improve food safety in Nigeria have centred on training to vendors or food handlers (e.g., (18–20)), even though research on Nigerian consumers has frequently found their food safety practices to be inadequate (21).

The EatSafe program aimed to fill this gap in consumer-centred approaches by developing and testing a set of evidence-based interventions to leverage consumer demand to improve food safety in traditional markets, generating knowledge in the process. EatSafe in Nigeria operated from 2019 to 2023, with a 12-month intervention period in two traditional markets: Birnin Kebbi Central Market in Birnin Kebbi, Kebbi State and Dankure Market in Sokoto City, Sokoto State (22). One of its interventions was a Safe Food Market Stand: an in-market location hub in or near the target market

¹ Food safety is defined as the assurance that food will not cause harm (chronic or acute) to the consumer when it is prepared or eaten according to its intended use (1).

that offered information and activities related to food safety. The Stand was intended to help increase consumers' knowledge of food safety while providing skills and confidence to engage in discussions with food vendors to inform better purchasing decisions. This implementation research study seeks to understand the implementation of these Stands, particularly how they were perceived by staff and market shoppers and any barriers shoppers faced to visiting or engaging with it.

THE STAND INTERVENTION

The EatSafe Nigeria interventions were developed based on extensive formative research, including



reviews of prior research (7,21,23–31) as well as primary research studies in the intervention areas (32–35). Once this research was complete, the knowledge generated was fed into a 'Design Sprint' process: a time-limited, intensive, and interactive process to brainstorm a range of potential solutions and decide on the most promising amongst them. This was followed by pilot testing and refinement. The EatSafe design process was documented in detail in an earlier GAIN working paper (36). One of the ideas emerging from this process (alongside a radio show, a food safety brand that could be used to identify 'safe' vendors in the market, and a later-discarded festival on food safety) was a Food Safety Market Stand (henceforth, 'the Stand') that would educate consumers and vendors about food safety issues and motivate them to act to mitigate them. To operationalise this

idea, EatSafe staff worked with market officials to identify and lease a centrally located, sufficiently large space in each market for the planned stand. EatSafe then hired local staff to engage with consumers and vendors and trained them on basic food safety principles and how to communicate to consumers. Consumer-facing communication materials, such as commodity-specific food safety pamphlets, were also developed.

The Stand in Birnin Kebbi was launched on the 9th -September 2022 and the one in Sokoto was launched in early December 2022. Both were implemented through December 2023. Each stand was staffed by five trained staff members and open six days a week (Monday to Saturday) for market shoppers to visit. It offered information on food safety to shoppers through one-on-one conversational advice, hand-outs and visual aids, and in-person events. These events included cooking demonstrations on food safety and hygienic practices, simple storage techniques (e.g., storage of leftover meat and fish using Ice blocks and coolers, storage of beans using hermetically sealed bags), proper food handling and hand-washing demonstrations, testimonials from community leaders, and visits from influencers (e.g., veterinary doctors, environmental health officers) and government

officials. In-person events were organised approximately weekly. When an activity was not scheduled, visitors could still ask questions to the Stand staff, view or take home 11 pamphlets in English and Hausa (the local language) with easy to understand, illustrated food safety tips (e.g., purchasing safe meat and vegetables; buying safe prepared foods; and transporting food home safely). The stands were intended to be hubs for consumer education and engagement that provided appealing, locally relevant food safety information and made consumers' voices heard by vendors and other trusted stakeholders. As of December 2023, during EatSafe closeout, nearly 10,000 shoppers had visited them.

STUDY METHODOLOGY

This implementation research study sought to understand the implementation of the Stands. In particular, it aimed to probe consumers' experiences engaging with the Stands, including understanding any barriers to visiting or engaging with it, and how Stand staff perceived of the Stand intervention. It focused on both markets where stands were developed, Birnin Kebbi Central Market and Dankure Market, and on both stand staff and target shoppers. The sample size in each market was 5 stand staff and 25 shoppers. At least 15 of the 25 consumers were meant to be people who had visited the Stand in the past, and at least 5 were meant to be people who had not. At least 10 of the 25 were planned to be women (based on prior data that has shown that most shoppers in these markets are men). Consumers were defined as those who shopped in at least one target market, at least once a month on average; had primary or shared responsibility for purchasing food for their household; and were NOT stand staff, food vendors, or involved with market management.

For stand staff, the sampling was exhaustive: five consultants were contracted by GAIN to staff each stand, and all five were approached and requested to participate in an interview. All stand staff, however, had the opportunity to decline the interview request as part of the informed consent process: it was not mandatory. Shoppers were approached randomly (in line with the abovementioned gender quotas) at the market exit/entrance, asked a few rapid screening questions to understand their eligibility, and then asked whether they would be interested in participating. If they were, the data collector administered the informed consent process and then set a time for a later interview, at the interviewee's home and at a time that was convenient for them.

Data was collected in partnership with a local research partner, QualiQuant. In-person semi-structured interviews in Hausa or English were used; these were audio-recorded and later transcribed, translated into English, and used for the analysis. Finally, structured observations were conducted at each Stand (n=16 total). Participant confidentiality and the security of data were strictly upheld throughout the study. A process of signed informed consent (translated into Hausa) was used, and the protocol was approved by a local IRB before data collection (approval number NHREC/01/01/2007). Demographic data and the responses to closed-ended questions were tabulated in Excel spreadsheets and/or Stata SE15. Text data from the interview transcripts was subjected to thematic analysis involving multiple passes of coding using the qualitative data software ATLAS.ti. In this paper, anonymised quotations are used to illustrate the main themes identified through the data analysis; these are associated with four-digit numerical ID numbers.

RESULTS: STAND OBSERVATIONS

Observations lasted 60-90 minutes. During the observations, an average of 3.5 (range: 1-5) staff members were present at the stand (though not necessarily the entire time). Observers generally felt the Stand itself looked good, but that there were some issues with its location: being in an out-of-the-way area (Kebbi) or one with a lot of litter or loitering young people around, who might discourage visitors (Sokoto). In Sokoto, it was also noted that the stand needed more chairs to allow for more comfortable discussions with visitors. Observers had generally positive impressions of the stand staff, though one observer noted that they were not proactive in offering materials like flyers – they only gave them if asked – and that they sometimes arrived late or left during their shifts.

The median number of visitors during the observation period was 18 (14 per hour), but there was a large range (0-40); during two sessions, no visitors came, and an additional three (of 16) sessions had fewer than 10 visitors. On average, 30% of visitors were women and 14% were children. In general, about half of the visitors talked to the staff during their visit. A slightly higher share of men (60%) talked to staff during their visit than did women (47%), but this difference was not statistically significant. Main topics that visitors discussed with Stand staff included the purpose of the Stand and its planned activities (e.g., when there would be a cooking demonstration and what would be cooked), and the proper ways to select, prepare, or store foods to avoid food safety issues. Observers generally felt that the interactions with visitors went well, with the visitors understanding well the staffs' messages.

The stand staffs are well dressed and welcoming, which makes them easy to approach by the visitors.... [They] were active and energetic during the conversation with visitors... [They] make the information very simple for the visitors to understand. - *Observer in Kebbi*

They have the capacity to share information and engage the visitors, they look very eager to engage the visitors in discussions. - *Observer in Sokoto*



Figure 2. Interactions with Staff at the Safe Food Stand in Dankure Market, Sokoto

RESULTS: STAND STAFF INTERVIEWS

BACKGROUND, TRAINING, AND MOTIVATION

All 10 Stand staff were interviewed. Most (seven of 10) were women, and they came from diverse backgrounds. Most, but not all, had some prior experience with food and/or public health. For example, one had studied microbiology and environmental health, while another had worked with a nutrition non-government organisation and was currently studying public health. While some were in their 20s, others were older with over two decades of experience.

All respondents reported being trained by EatSafe. For all, this included an in-depth initial multi-day training on food safety and their role; most also reported a refresher training on the same topics (also multi-day), while some reported shorter subsequent trainings, either focused on aflatoxins and proper storage technologies for grains and legumes or on soybean processing. They generally spoke highly of the training, saying that it had been high quality and sufficient for them to carry out their role. As one Sokoto Stand staff noted, '[The training] was top notch.... I can rate it 99.9 [of 100] because I learnt a lot' (2104). Only one interviewee noted a need for more training, covering more detailed food safety topics (i.e., which bacteria cause which diseases). Two interviewees commented that the first training had some gaps, namely in terms of insufficient interaction and hands-on, practical guidance, but that these were addressed in the second training, which was stronger.

Most of the interviewees were motivated to work at the Stand by a desire to help contribute to public health, development, and/or the wellbeing of the local community. Some interviewees mentioned other motivations, including learning more about food safety to improve their own health or learning more about how to relate to people in the community.

[The announcement for this job] was so interesting, and it drew my attention because they say health is wealth. If you are not healthy, it's an issue. And the rate of food poisoning is increasing rapidly in our society, whereas people are not ready to discuss or find a way. But when I saw this implementation, I was like, 'I want to be part of it to contribute my own to the success of the thing.' – *Staff member in Sokoto (2122)*

I am currently pursuing my degree in bachelor's of medicine and surgery, that is because I have a passion for caring for people: I like it when I see people healthy. And it has come to my concern that being healthy boils down to what we eat, and being a healthcare provider, I have seen how important what we eat is to our health, especially for women and children. I realize that most of our children are suffering from malnutrition, so when I came across and heard about EatSafe, I was happy and willing to also be a team member of this great team that will bring about that change... such that we can eradicate malnutrition and stunted growth in children. – *Staff member in Kebbi (1128)*

All staff were able to clearly articulate the goals of the Stand, in line with project's goal to raise awareness on food safety issues among local consumers. One also mentioned another potential goal: inspiring local women to adopt new businesses through the soymilk training. All interviewed staff also reported that they enjoyed working at the Stand. Most mentioned both the enjoyment of feeling like they were helping people and contributing to society as well as enjoying the interactions with the public. One also noted appreciating the training and support of their supervisor.

[I enjoy working at the Stand] Because I get to sensitise people, talk to people, interact with them, they will tell you their problems and you will tell them what to do. – *Staff member in Sokoto (2104)*

[I enjoy working at the Stand] Because I meet different kinds of people every day. The ones that will make you laugh, the ones that will make you feel surprised like the ones that will just come and test you to know if you really know what you are doing here.... So we meet different kinds of people every day. – *Staff member in Sokoto (2122)*

When asked, about half of staff members did not name anything that they did not like about working at the Stand. Others noted long hours; disagreements among people; and that it could be difficult to get vendors and shoppers to participate in the activities, given their time constraints. A couple respondents mentioned not liking giving cooking demonstrations, as they were men and felt this was women's role or felt such activities involved mostly women. All cited a desire for the Stand to continue beyond the EatSafe program.

All staff members noted that they had learned new things through their involvement with EatSafe and working at the Stand; these mostly included technical topics (e.g., aflatoxins, safe food handling, how to make soymilk, nutritious foods), but some also mentioned soft skills, like how to interact with diverse types of people. All staff members also felt that working with the project had changed their own food related practices, particularly by being more selective about which foods they purchased and their food handling and storage practices.

Right now, when I go to buy things, I know what to buy. Should I see a neighbour trying to buy something that is not good, I will advise him not to. I used to have this mentality of having a particular customer [vendor] that I must buy things from, but now I don't. – *Staff member in Kebbi (1107)*

Before, 100% of us bought these damaged tomatoes. But ever since I started working here, I knew that this thing causes damage. We have to make immense changes in buying stuffs like that in the market, especially vegetables. It has made a positive impact on how I do my shopping. – *Staff member in Kebbi (1124)*

STAND ACTIVITIES

Most interviewed Staff reported that the Stand drew about 20-30 visitors on a typical day, but attendance was considerably larger (e.g., 60-100 people) on days with demonstrations or other hands-on activities. Most felt that slightly more women than men visited the Stand, though a few opined that it was the opposite, and that about 10%-30% of the visitors were repeat visitors, as opposed to first-timers.

Interviewees described their typical day as involving attempts to attract people to come to the Stand (such as by playing music or greeting them or handing out flyers); being friendly and welcoming; explaining the purpose of the Stand to any visitors; handing out flyers; and answering visitors' food-related questions or giving them general advice on how to buy safe food at the market. Some mentioned collecting phone numbers to send SMS health tips or invitations to activities. Several noted that people did not always immediately understand what the Stand was, thinking it sold food like

other shops in the market, and thus some explanation was required – and this curiosity could be helpful to attract visitors to stop.

When people pass, some would not like to ask, they will just pass because they think it's not their concern, but food safety concerns everybody. So we drag their attention to us, we explain why we are seated outside and what we do. – *Staff member in Kebbi (1124)*



Figure 3. Visitors gathered for an event at the Birnin Kebbi Central Market Safe Food Stand.

A few staff members noted that they would ask shoppers what they had come to the market to buy, and engage them based on that. ‘For instance,’ one explained, ‘if the visitor is here to buy beans, I will tell the visitor to ensure that he perceives the smell of beans and if he perceives any foul smell or chemicals, he should run from it and go for the one having no smell at all’ (1128). The only material mentioned as available for visitors were flyers. Stand Staff reported occasionally holding events, including demonstrations on food preparation or cooking (focusing on proper hygiene and food handling) or on food preservation and storage; sensitisation on hand-washing; having doctors or other experts lecture; playing the EatSafe radio show; and hosting a sensitisation on EatSafe’s other in-market intervention, the *Abinci Fes-Fes* safe food brand. One respondent also mentioned running monthly compliance checks on *Abinci Fes-Fes* vendors.

Sometimes when they [shoppers] enter the market, they are unsure about what to buy or where to buy it. So they will come to the stand, they will ask us that they want to buy this and where do we think it's advisable for them to get it. And then we refer them to a vendor we know that is very clean because there are so many vendors out there. We tell them that anyone that is wearing a green apron called *Abinci Fes Fes*, they can go to them because we can assure them that they have been trained and they are following what we have trained them on... And apart from that, they can also go to vendors that look very neat. – *Staff member in Sokoto (2130)*

The main topics that visitors asked about included the purpose of the Stand and the EatSafe project; about planned activities; how to choose safe foods at the market (i.e., differentiating good items from bad ones); safe storage and preservation were somewhat less commonly mentioned, and one respondent mentioned nutrition advice. All felt these interactions generally went well, but about half noted opportunities for improvement. Two mentioned more promotion of the Stand via the media, one suggested training consumers in-depth (like had been done with vendors as part of the *Abinci Fes-Fes* intervention), one suggested moving the Stand to a more central location, one mentioned wanted a more comfortable Stand to work in, with air conditioning or a fan, one suggested adding a banner, and one noted a need for more space, and more seating for the demonstrations.

I think the one they are most interested in is "if I go to the market, how will I know that this food is bad and this one is not bad"... They will just want to know the difference between the good and the bad, so we have pictorial representation of those commodities, so we share with them. – Staff member in Sokoto (2104)

Staff members generally agreed that the special, hands-on events were particularly impactful, both in terms of high attendance and interest by visitors; however, one person noted that these events are difficult to organise and facilitate in an orderly manner. In general, Stand staff particularly appreciated cooking demonstrations; this was due to them being popular with shoppers, hands-on, practical, and/or providing the audience with the incentive of getting something to taste. As one Kebbi staff member put it simply, 'Everybody loves to eat' (1124). A gender divide appeared around the activities, with female staff strongly appreciating the cooking demonstrations, whereas and male staff did not feel as comfortable with the hands-on events. Moreover, one staff member noted that some of the more complicated recipes made demonstrations logistically difficult. Several staff members noted that soymilk demonstrations were particularly popular; one staff member stated that this was because there was a business angle: attendees could learn to make soymilk and eventually start a business selling it.

The events were very, very interesting because a lot of the consumers gained a lot from us. And we are very happy to impact knowledge on other people. – Staff member in Sokoto (2130)

Two staff members named hand-washing as the least popular event with shoppers. 'Most of [the shoppers]', a Kebbi Stand staff explained, 'will not just leave their house to the market because you want to show them how to wash their hands' (1128). Two staff members also noted that the *moi-moi* cooking demonstration was not popular, as shoppers felt they already knew well how to make the dish; one noted soy cheese as being too complicated, and another opined that bean storage was not very applicable to shoppers who usually buy only small quantities of beans.

All staff members appreciated the flyers as being informative, visually appealing, and widely



Figure 4. Materials available for taking from the Safe Food Stand.

understandable (in English and Hausa), though one noted that the kitchen pictured on one of them was unrealistic for the local context. Several staff members suggested posters, banners, or placards, in Hausa, to be placed around the market (either to promote the Stand or to inform on food safety topics). Several mentioned that Hausa-language materials and those with many pictures were particularly important, as many shoppers did not speak English, and some could not read.

Most staff reported feeling comfortable speaking to visitors of any gender, but one woman expressed some hesitancy about men who might not have the right expectations, and one male staff member noted, 'You know how our religion is. It is not so allowed to speak with the opposite gender as such, except for a woman who desperately has a need and is willing to speak with a man, then she can go ahead. Women prefer to speak with women and vice versa... a woman will not feel so free to talk to me as a man, unlike the way she would talk to a woman'. Several noted that it was a strength that the Stand had both male and female staff, to offer flexibility to visitors of both genders.

All staff shared that they felt confident in their knowledge and skills to work at the Stand. As one Kebbi Stand staff explained it, 'I can talk to anybody regarding food safety, I can answer any question, I can handle any food safety related challenges... Considering the trainings I have had, that has boosted my morale and confidence' (1128). A few noted occasionally getting questions from visitors to which they did not know the answer (e.g., those on specific medical needs, like asthma or diabetes). One noted the helpfulness of GAIN EatSafe staff, whom they could call upon when they needed more technical information.

PERCEPTIONS OF THE STAND

Several Stand staff noted that shoppers were motivated to visit the Stand to learn about food safety generally or get advice on specific food safety topics (e.g., how to store certain foods), but others mentioned the Stand being visually attractive or unusual looking, or playing music, as being part of what attracted visitors, two noted that word of mouth helped draw visitors, and one mentioned that promotion via the radio show had helped boost attendance. One respondent also noted the location being in the market helped draw visitors, as they would be visiting the market anyway. A few staff members noted activities, like demonstrations, as helping motivate shoppers to visit – or that they simply formed a crowd, which motivated others to stop, to see why there was a crowd.

The main reasons staff cited for why shoppers might not choose to visit the Stand were them not having time or being in a hurry and the Stand being in an inconvenient or unnoticeable location. Some also mentioned people lacking interest or curiosity, not feeling welcomed, not getting attention or having their questions answered, and being shy. A few Stand staff in Kebbi noted that the location of the Stand was not ideal, as, in a largely unoccupied part of the market, it did not get very much foot traffic. Only one staff mentioned getting complaints from shoppers (not receiving the planned messages about events).

In terms of areas for improvement, one staff member noted that offering refreshments would help attract more visitors to events. Another noted a desire to train teachers and/or students as being an easy way to impact a large number of people, and two cited a need for more equipment (e.g., utensils, chairs, gas burners, pots). When asked what activities they would like the Stand to do in the future, several staff mentioned doing more of the same as at present, particularly cooking demonstrations. Two named more entertainment (e.g., theatre, music, dance) and expanding to other markets, and one each mentioned sensitizations at hospitals, school visits, outreach to rural areas, home visits, outreach to other organisations, training vendors on use of personal protective equipment, starting a TV programme, and organising consumer-vendor clean-ups. No staff members cited any activities that they would suggest dropping.

RESULTS: SHOPPER INTERVIEWS

Of the forty-nine shoppers interviewed, 62% were women, 70% were married, the median household had two children (range 0-7), and the median age was 30 (range 18-48 years). Most interviewees had completed secondary school, while about a third had completed post-secondary education. About 10% each were unemployed or students, while most worked in either business and trading or in professional occupations like teaching or civil service. In nearly all households, a man was the main household income earner. Thirty-nine interviewees had visited the Stand, while ten had not.

INSIGHTS FROM NON-VISITORS

All 10 of the interviewees who had never visited the Stand had the potential to visit the Stand; they visited the market regularly and often looked around different parts of it when shopping. In some cases, interviewees mentioned spending additional time in the market if something interesting was happening, but others noted that they would just get in and get out quickly.

Of the ten non-visitors, half had heard of or seen the Stand, just not visited, while the remainder had not even heard of it. Most who were aware of it had either seen it in the market or heard of it through word of mouth (from vendors or friends). Three of them had a clear understanding of the purpose of the Stand, whereas two did not. Reasons given for not visiting included not having time or being in a hurry, not knowing what it was, or it being closed. Several interviewees mentioned that the Stand focused on teaching women cooking skills, and a couple interviewees noted that this focus was not interesting to them. One man noted, 'I am not really interested in the cooking competition.... Because it is mainly the duty of women to cook' (2331), while a woman noted 'I don't have that time to wait and watch people cooking' (2319).

A few mentioned not knowing where the Stand was, never seeing it, or perhaps seeing it but not knowing what it was: 'There was a time I went to the market, and I saw a place decorated as though it were a restaurant. Maybe that's the place, because I saw banners with inscriptions of food' (1325). Similarly, some of the suggestions for increasing attendance at the Stand centred on raising awareness of it, making it easier to access, or having staff at other places in the market.

Since I have never seen them, if possible if they can stand at the entrance to the market where people can see them easily, it will be nice... They should have people who will go about making publicity and even play music so people can know what is going on and be interested. – Kebbi shopper (1306)

Most interviewees expressed interest in visiting the Stand, once it was explained to them, and in participating in activities and getting handouts. However, a few interviewees noted that they did not want to spend additional time at the market to visit a Stand or would only come if there were prizes or gifts involved. As one woman in Sokoto noted, 'If I am not winning anything, I will not be interested. I will only be interested if there is an incentive attached to it' (2319).

STAND VISITORS

Like the non-visitors, most of the Stand visitors went to the market several times a week, though about a quarter of them only went once a week. About one quarter had visited the Stand only once, 40% 1-2 times, 15% 3-5 times, and 20% six or more times. Most visited as part of a normal market trip, but a large minority came specifically for events. About half had heard about the Stand through word of mouth (particularly from market vendors, but also friends and community members), while the remainder mainly saw it in the market and were curious, and a small number mentioned receiving text messages² or hearing about it from EatSafe staff or collaborators.

Several mentioned that curiosity – seeing an event happening and being curious what it was – was part of the initial draw, particularly given that the Stand looked a bit unusual, and when it was organising special events and crowds formed. This proved to be an inroad for attending the event, having a conversation with the Staff, or getting written materials. At the same time, a few interviewees expressed that the stand could be confused for a restaurant, and it would not necessarily be clear to market shoppers what it was intended to aim.

[My husband and I] saw this office, it wasn't there before. After we parked, we decided to go there and check, because the place looked like a restaurant, but we were not sure of what they were doing there.... So curiosity made us go and check. - Shopper in Sokoto (2220)

I was just passing by when I saw people gathered there, so I went to check what was happening over there..... I was in a hurry that day, but the little I heard was how they talked about food safety, and they gave me some pamphlet to take home and when I got home, I still go through it, and they talked about how to buy good food and how to prepare it. – Shopper in Kebbi (1223)

Nearly all visitors were able to articulate the purpose of the stand along the lines of educating people about food safety, hygiene, or cleanliness. Almost every interviewed visitor reported telling their family and friends about the Stand. About half of the interviewed visitors mentioned visiting the Stand to attend an event, particularly soymilk demonstrations; others noted talking to staff (either about what the Stand was, or about specific food safety questions) or taking flyers. Most respondents who visited both talked to the Stand staff and took flyers. However, five respondents noted that they just briefly looked at or listened in to the activities, then left, without an extended visit or interaction with the staff. The majority of those who took flyers reported later reading them, and there were few criticisms of the flyers' content, with most finding them easy to understand. As one Sokoto shopper explained, 'even if someone doesn't know how to read, there are pictures that show what is supposed to be done and what you are not supposed to do' (2211).

² GAIN sent monthly text messages to all the people who participated in the baseline survey for the project and agreed to share their phone number, making them aware of the project activities.

When I went to the stand, I asked questions about what was going on. I was then briefed on the fact that they are giving people orientation on what to do and how to get good food items in the market. Also, how they can take care of their food items when they return home to prevent it from spoiling... I was also given short pamphlets carrying pictures, of how to treat food items and shops to go to and get clean food items. – Shopper in Sokoto (2207)

Well, after asking them about what is going on, I was told about the presentation, the perishables too. They explained the health implications of eating bad food and all that. I actually liked it because the cheap food that people go for are usually not healthy. It may not even be nice but people go for it because it is cheap. Especially for tomatoes, people go for the broken ones instead. We were actually cautioned about that.... The meat, we were told of the kind of meat to buy. I could even see it in the pamphlet. – Shopper in Sokoto (2208)

Those who attended the cooking demonstrations generally spoke highly of them as being educational and engaging, during which they learned something new – even if the dish being prepared was a familiar one.

[The demonstration] was fantastic, because of the way we did it, We made our own soya milk compared to the one we learned before, the one we made that day we only add sugar without any flavour... The way the preparation was made I can say they are perfect about how they handle it; we were taught how to wash our hands. – Shopper in Kebbi (1226)



Figure 5. A demonstration of preparing soymilk under good hygienic conditions at the Birnin Kebbi Central Market Stand

Aside from three interviewees who had visited only briefly and had no opinion, all visitors had positive impressions of the stand staff, noting them to be knowledgeable, polite, friendly, welcoming, and helpful. ‘I like the way they welcome you, sit you down, make sure you are comfortable and explain everything to you,’ one shopper in Sokoto explained. ‘I also love the part of explaining how to get clean safe food in general and also how to preserve your perishable food’ (2206). A few respondents specifically appreciated that the staff were respectful, did not look down on people or did not discriminate based on visitors’ backgrounds. Most women visitors reported preferring to speak to a female staff member (either because of cultural norms or because they expected women to know

more about food); most men also preferred speaking to men, but a sizeable minority also preferred speaking to a woman, as they felt women knew more about food.

I will prefer to talk to a male... Because I am a man, discussion between a fellow man will be easier, but you see, a female would easily relate to a fellow female better. – *Male Shopper in Kebbi (1221)*

[I would prefer a woman] Because she is my fellow gender, we can talk more about cooking because the knowledge I have, she might not have it and the knowledge she has I might not have it, so we can both share ideas. – *Female Shopper in Sokoto (2202)*

Sincerely, when it comes to food talk, it is better to speak with a woman... Because a woman is knowledgeable when it comes to food. She knows what is good and bad. How to take care of food items. That is their duty even in the home. A woman will be very meticulous when she comes to the market to buy stuffs, unlike a man. – *Male Shopper in Sokoto (2207)*



Figure 6. Stand visitors learning how to make soymilk during a demonstration, Birnin Kebbi.

About half of the visitors were able to cite specific food-safety related knowledge they had gained by visiting the Stand, while a few others described learning about soymilk preparation, but not food safety, specifically, and the remainder could not cite anything specific they had learned. Those who could cite knowledge gains generally mentioned learning about the connection between cleanliness and food safety and/or the connection between gastrointestinal illnesses and unsafe food. At the same time, slightly over half of respondents reported that the Stand had changed their ways of shopping, handling, or preparing food. In particular, most mentioned choosing to buy food from vendors who are clean or sell clean food, but also how to clean and store food at home. A few respondents

specifically mentioned avoiding spoiled tomatoes. The health of themselves, their family, and the public were their main cited motivations for making these changes.

I have learned a lot, I have learned how to prepare my food, how to preserve my food, how to eat healthily, and how to cook my food so that anything that is unhealthy will die in the boiling point. I've learned a lot, like how to wash my hands after going to the toilet, because there are so many things we cannot see, so washing your hands will do you a lot of good. And I think it's really improving because there are people going there now and lots of awareness. – *Shopper in Kebbi (1202).*

Yes, it has changed the way I do my shopping... when I do my shopping, I make sure I buy the good items and not the spoilt one. I spoke to my neighbours about it... [I told them] they should make sure they are neat during shopping not only when working and when they are

husband buys the item at home, they should also make sure they wash and prepare it in a good and neat way. – *Shopper in Kebbi (1223)*

Among reasons for not visiting more often, or not attending events, respondents generally referenced time constraints, being busy, or not coming to the market often. A couple of women mentioned needing their husband's permission to spend a long time at the market: 'My husband would not want to stay long in the market because I have children, and I need to take care of them at home' (1223). A few also noted that, having visited the Stand once, they did not see a reason for going again. As one person put it bluntly, 'nobody will pay me anything, why will I participate?' (2218). Finally, two respondents mentioned that they thought they could only go when invited (e.g., when they received a text message inviting them to a specific event). Several respondents in Kebbi noted that the Stand was hidden in the market and hard to find, and its location was cited as one of its main weaknesses. As one Kebbi shopper explained, 'I am happy with the stand, I just want the stand to be positioned in place where people can easily see it, such that when they are coming into the market can see the stand and they can be enlightened' (1221). Some also noted that the space was too small or too crowded during events, with inadequate seating.



Figure 7. Participants in a training on marking Tom Brown porridge, Birnin Kebbi Central Market Stand

Slightly more than half of respondents suggested ways in which the Stand could improve in the future. The main suggestions made by multiple respondents were to enlarge the space; expand the Stand (to other markets, or multiple Stands within the existing market); better advertise the Stand with banners to improve visibility; move it to a more central location (e.g., the roadside, or the front of the market); have more staff, particularly women; have staff walking around the

market to make them more accessible and visible; and to give refreshments, gifts, or other incentives. Those named by only one respondent included doing home visits to reach the less well-educated, particularly women; outreach to schools; doing more diverse cooking demonstrations, with foods from different ethnicities and male involvement; being open at night; involving more food sellers; making a movie, book, or a radio show; using a projector for presentations; and giving staff ID cards.

When it is boring, they will not listen. Even if it is not boring, some people will not listen. But if it is being demonstrated, it will capture the attention. So if they are making use of local people like people doing drama, speech performances, and poetry performances just to pass the message, I think the knowledge will get across to too many people. – *Shopper in Kebbi (1205)*

Having more stands, like 4 or 5, will do a lot. The market is big, and people don't enter through one door and at least having it each door will make people know how to eat safely and live a healthy lifestyle so that's what I need them to improve in the future. – *Shopper in Kebbi (1202)*

DISCUSSION & CONCLUSION

The Safe Food Market Stands in Birnin Kebbi Central market and Sokoto's Dankure market were designed as platforms for engaging food shoppers on the topic of food safety in a convenient place where they already would be: the local food market. This implementation research study demonstrated considerable promise in support of that idea. The intervention was able to recruit and train dedicated staff members who appreciated the work and were motivated by the project's mission. For them, engagement with the intervention improved both their technical knowledge and their soft skills for interacting with the community. Stand visitors found the Stand staff to be welcoming, well-informed, and engaging. Many visitors reported these engagements had positive impacts on their own food safety knowledge and practices, in particular increasing the care with which they selected vendors and foods in the market. While this non-random qualitative study cannot indicate intervention impact, these findings are encouraging signs that the Stand may help to achieve EatSafe's goal of improving food safety practices in the two intervention cities.

Due to the design of this study, it cannot provide clear information on the number of people reached with the intervention, though qualitative data suggest about 30-40 visitors per day, with about one-third of those being repeat visitors. Furthermore, monitoring data from the project suggest about 9,000 people visited the Stand in Kebbi over the project duration (excluding those who only attended a demonstration special event). While this is a large reach, such an intensive approach (i.e., requiring multiple staff people, all-day, nearly every day) is likely not sustainable. Either increasing levels of engagement or decreasing resource use (or both) is likely necessary.

Increasing shopper engagement in traditional markets is challenging: respondents noted strong time constraints faced by most shoppers, as well as limited interest from some. Like managing Stand operations, it may prove difficult to sustain engagement over time. Both shoppers and staff noted that a large part of the motivation for visiting the Stand was initial curiosity, to understand what it was. While this did offer the opportunity for substantive food safety discussions, it is unlikely to be sustained in the long term, as most shoppers will already understand the Stand's purpose. Ongoing creativity, ways of keeping the Stand 'fresh', and approaches that connect its activities on food safety to other events and issues will thus be key. Moreover, the use of multiple channels of consumer engagement on food safety – as already done by the EatSafe project via its *Sayen Nagari* radio show and the *Abinci Fes Fes* brand – could help to sustain interest and raise awareness even among those who do not visit the Stand.

Events played a key role in attracting crowds, but engaging diverse groups is critical: from the remarks of certain interviewees, it seems that some cooking demonstrations might not have broad appeal (particularly with men). Events are also resource-intensive to organise. Potential future interventions might consider doing more recordings, video projections, or simplified events that could be done with fewer staff.³ Reliance on more hand-outs, posters, or other visuals that do not require staff could also be an option.

Other areas for future improvement emerging from the study include finding a more central location for the Stand (particularly in Kebbi Central Market) and enlarging the space to facilitate bigger events

³ While incentives (such as refreshments or gifts) were suggested by interviewees, these are clearly unsustainable as a long-term way of attracting attention.

– though these two goals may be in opposition to one another, as finding a large space in a central market location is unlikely to be feasible. Other study participants’ suggestions for increasing awareness of the Stand could be considered in future approaches: having more and clearer explanatory signage in and around the market (in Hausa) at the Stand itself and having roving staff who would walk around the market or be positioned near an entrance to engage people when they arrive. In future interventions, the naming of the stand could also be improved, based on an understanding of the community’s literacy level and local terms: in both Kebbi and Sokoto, there was considerable confusion related to the name of the stand, as most visitors thought it was a restaurant or food-selling point because of the name. Other ideas suggested by both staff and shoppers included: training students or teachers through school visits and conducting home visits, particularly to reach Hausa women who may not leave the home due to conservative local customs. Future interventions could also consider more engagement in the digital space, such as WhatsApp messages with short, informative images or messages that could be forwarded easily to others. Training women’s groups on food safety could also help increase coverage while accommodating women’s religious, cultural, and time-related constraints.

The study results also revealed some interesting aspects related to gender. Many visitors and staff had preferences about wanting to engage with people of the same gender – which is unsurprising, given that this region of Nigeria has strong conservative gender norms that limit interactions between unrelated men and women (37). It was thus a key strength of the Stand that it had both male and female staff, to offer flexibility to visitors of both genders. However, there were also a few areas in which the gender-sensitivity of the approach could potentially be improved. For instance, several respondents associated the Stand primarily with cooking, with some men seeing this as not interesting to them, as that was ‘women’s work’. A couple male staff members were similarly hesitant to be involved in cooking demonstrations. While it is important to respect these norms and opinions, the Stand could also offer a platform for more gender-transformative work (38) that seeks to challenge this norm, such as through deliberate involvement of men or boys in the cooking demonstrations, or showcasing Nigerian male chefs (either in person, as feasible, or by featuring their work in handouts or presentations). Since a non-negligible share of Hausa women do not regularly leave their homes to come to public spaces like markets (37), future interventions could also consider home visits that would enable reach to these women.

Overall, this study’s initial insights regarding the Safe Food Market Stands implemented under the EatSafe project provide encouraging evidence that the approach did successfully engage food shoppers on food safety directly in a traditional market setting. These positive interactions should be able to continue in the future, as it is planned that both stands will be transferred to local ownership and oversight, with discussions underway with local government entities, including the market management of the Birnin Kebbi Central Market.

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