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**Enhancing the food security of the
peri-urban and urban poor through
improvements to the quality, safety and
economics of street-vended foods**

Johnson, Paa-Nii T. and Yawson, Robert M.
Natural Resources Institute, University of Greenwich, Food
Research Institute, Ghana, Department For International
Development (DFID), UK

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DFID/NRI/FRI PROJECT

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Project Title:

**ENHANCING THE FOOD SECURITY OF THE PERI-URBAN AND URBAN
POOR THROUGH IMPROVEMENTS TO THE QUALITY, SAFETY AND
ECONOMICS OF STREET-VENDED FOODS**

REPORT ON WORKSHOP FOR STAKEHOLDERS, POLICY MAKERS
AND REGULATORS OF STREET-FOOD VENDING IN ACCRA , HELD
AT MIKLIN HOTEL, 25- 26, SEPT. 2000

Edited by

P-N. T. Johnson and R. M. Yawson

Food Research Institute (CSIR)

Box M. 20, Accra

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Introduction

There has been a continuing growth in urbanisation in developing countries, and governments' face a major challenge in ensuring that city dwellers are able to procure sufficient food. Street foods are sold in almost every country in the world. The FAO (1989) defines street food as any ready-to-consume food that is sold in public places. Tinker (1997) also defines street food as any minimally processed food sold on the street for immediate consumption. In most towns and cities in Ghana, selling of snacks and whole meals on the streets is an important way to obtain income, especially among the poor women. Street foods have a long tradition in most countries. The role of this sector in the urbanisation process and the urban economy reflects the way of life and the survival and coping strategies adopted in most African cities (Gnammon-Adiko 1996). Rapid urbanisation is breaking down traditional family ties throughout the world and the street food sector is widely understood as an inevitable phenomenon tied to urban growth. This urbanisation and the associated social and structural changes have caused the demand for street food to increase. Longer traveling times between living and working places is likely to lead to further increases in demand. Accra with a current population of about 3 million is the capital of Ghana and is hampered by an inadequate transportation system linking the sub-urban areas with the commercial and industrial centres where men and women work. Street food accounts for a part of the daily diet and so contributes towards meeting nutritional requirements, although the contribution varies. Urbanisation and migration have changed the patterns of living and eating. The easy availability of foods in the streets of cities and small towns has helped workers cope with long periods of absence from home. Street foods contribute significantly to food security and nutrition and are physically and economically accessible to most people. It is an activity that provides employment to many, while providing nutritious, inexpensive and tasty food to millions of working women, men, children and students. Unfortunately, the emergence of informal food businesses can cause health problems if the foods are not prepared and handled properly.

Poverty, coupled with rapid urban growth have compelled policymakers, development practitioners and program planners to take another look at food insecurity and malnutrition which hitherto were considered as rural problems. Sustenance in the urban setting is

characterised by a dependence on cash incomes, usually earned from the informal sector (Levin et al, 1999). Lower education, skill levels and childcare responsibilities may force women into the informal sector. Women have an important role in this sector; which draws upon their traditional skills and offers appreciable advantages such as low-start-up capital requirements, the reconciliation of household duties with small-scale trading and the possibility of feeding their families at lower cost (Canet and N'Diaye, 1996). In Ghana, these women balance their roles as income earners, homemakers and mothers. The share of the food budget spent on processed foods, convenience foods, snacks, and meals available as street foods has increased due to the need for women to save time in food preparation. Ghanaian women play a crucial role in the economy, controlling a large share of market activity and commodity trading. One of the fascinating aspects of urban social life in Ghana is the widespread presence of street food vendors. Operating from all strategic locations at all hours of day and night, they serve customers with spicy foods, colourful beverages at reasonable and affordable prices.

Long hours of commuting leave little time to cook, which contributes to the huge demand for inexpensive, convenient food near schools and work places. In Ghana the ability of street foods to satisfy unique taste and convenience requirements as well as meet the socio-economic needs of majority of urban dwellers has led to the rapid growth of the sector, and the gaining of some kind of recognition from the governing authorities. In Ghana, national and municipal administrators regulate the street food sector in the cities. These controls take various forms. FAO (1996) comments that the regulatory authorities fail to carry out their roles effectively mainly because of poor institutional capacity, lack of coordination, shortage of personnel and funds.

The FAO (1996) pointed out that rural-urban migration gave a sound footing to the activities of the street food industry because of the convenience and the variety it offers. Bad economic policies and falling cocoa prices led to an economic downturn in the 1980s; reduction in government spending and the devaluation of the currency propelled more people to the cities to eke out a living, often selling on the street. The implementation of a structural adjustment programme in 1983 increased the number of street food consumers.

Some earlier studies on street food vending in Ghana have taken place. The FAO and WHO have funded these. Unfortunately, the studies did not include potential food safety concerns such as the presence of heavy metals, pesticide residues and the presence of mycotoxins. The studies did not also examine the contribution of this informal micro-enterprises to the Ghanaian economy.

The DFID/NRI/FRI project on improved street-vended foods was a one-year exploratory study aimed at assessing the safety and quality of food sold in Accra as well as estimate the contribution of this sector to the national economy of Ghana. The project complemented previous work carried on the sector by other workers.

This workshop was therefore organized to present findings and identify new areas where further knowledge is required. As part of this dissemination, key stakeholders of the street-food vending business in Ghana made short presentations on the status of the foods sold in Accra. These short presentations are also included in this report.

The DFID/NRI/FRI Improved street-vended foods project

The purpose of the project was to contribute to strategies for improving food security of poor households through increased availability and improved quality of horticultural foods and better access to markets. The objective was therefore to assess and prioritise the economic and social importance, and safety and quality constraints of street-vended foods in peri-urban locations and to make recommendations on quality and safety risks associated with street-vended foods made, and identify areas where new knowledge is required. The objective was achieved through:

- Selecting case study products and vendors on the basis of perceived risk, volume traded and importance to consumers of street vended foods;
- Identifying supply chains for raw materials to the street vendor using informal rapid rural appraisal techniques;

- Assessing the significance of street vended products to the participants in the supply chain and the street vendors, and to the economy as a whole;
- Assess the food safety risks associated with street foods using the case study products;
- Dissemination of study outcomes to key stakeholders;
- Organise workshop for key stakeholders.

2. The Workshop

2.1 Opening Ceremony

The Deputy Director-General of CSIR-INSS, Prof. A. Ayensu, delivered the opening and welcome address and introduced Professor Owusu-Benoah, the Ag. Director-General of the CSIR as the chairman. In his address, Prof. Ayensu said the workshop would identify and prioritise the constraints facing those involved (suppliers, producers, vendors and consumers) with street vended foods in Ghana. It will identify where current knowledge can be applied and what new knowledge is required. Successful implementation of initiatives to apply such knowledge will ensure that poor people profit from improvements to their food commodity systems in peri-urban areas.

In delivering the keynote address, the Chief Director of MEST, said Street-vended food contributes significantly to the food security of those involved in its production, particularly suppliers of raw produce, food processors and vendors, as well as providing a readily available source of cheap nutritious food for consumers. It is an activity that provides employment to many, while providing nutritious, inexpensive and tasty food to millions of working women, men, children and students. In contrast to these potential benefits, it is also recognized that street foods are produced by those with limited knowledge of food safety practices and in environments that can compromise the hygienic preparation, storage and sale of the food. Street food vendors are frequently unlicensed and untrained in food hygiene or sanitation and work under very crude and unsanitary conditions. He therefore charged the workshop to lead the way in exploring the importance of Street-vended food to our livelihood.

Mr. Tomlins of the NRI introduced the workshop and set the tone for proceedings. He mentioned that the conference has brought together key stakeholders involved in food and environmental policy, food standards, quality enforcement and research to agree on recommendations to improve food safety and quality of street foods by these stakeholders without further research; and to identify and agree on areas where new knowledge is required to ensure impact on livelihoods of target beneficiaries. This should include the preparation of a strategy for the development and validation systems for improving the safety and quality of street foods that are technically, economically and socially viable.

2.2 Welcome address by the Deputy Director-General, CSIR-INSS

Mr. Chairman

Hon. Minister, MEST,

Directors of Institutes, Agencies, Departments and Organizations,

Participants from NRI - UK and Accra Office,

Invited Guest,

Distinguish Members of the Press,

Distinguished Ladies and Gentlemen.

I am indeed happy to welcome you all to this Workshop for Stakeholders, Policy Makers and Regulators on Street-Food Vending in Accra. This workshop forms part of an ongoing collaborative research between the Council for Scientific and Industrial Research (CSIR) and the Natural Resource Institute, UK on Enhancing the Livelihoods of the Urban Poor through improvements to the Quality, Safety and Economics of Street-vended foods.

The vision of the CSIR is to become a centre of excellence in research and development by generating technologies that are responsive to demands of the private sector and socio-economic development.

Our mission is to generate and apply innovative technologies, which efficiently and effectively exploit science and technology for socio-economic development in critical areas of agriculture, industry, health and environment and improve scientific culture of the civil society. Technologies developed will be commercialised for private sector development in Ghana and abroad.

The purpose of the project is to develop strategies to improve food security of poor households through increased availability and improved quality of horticultural foods and better access to markets. The project contributed to this purpose by identifying problems with the quality and safety of Street-vended foods and had suggested strategies for improvement to the benefit of the consumer and those working in this sector. The extent of benefits from Street-vended foods on the rural and peri-urban raw material supply areas has also been assessed.

The project undertook the following activities:

Economic, social importance, safety and quality constraints of street-vended foods in peri-urban locations assessed and prioritised;

Recommendations on quality and safety risks associated with street-vended foods made, and areas where new knowledge is required identified;

This workshop will identify and prioritise the constraints facing those involved (suppliers, producers, vendors and consumers) with street vended foods in Ghana. It will identify where current knowledge can be applied and what new knowledge is required. Successful implementation of initiatives to apply such knowledge will ensure that poor people profit from improvements to their food commodity systems in peri-urban areas.

The key beneficiaries will be those working in the street-vended food sector (street-vendors, processors and suppliers) through sustained and improved turnover, access to new markets and income resulting from enhanced consumer confidence. Household food security and financial independence of those employed in the street vended food sector will

be enhanced. Consumers will benefit from improved food quality and safety. Suppliers of raw materials may benefit from improved markets.

The main collaborators of this project are CSIR – Food Research Institute, World Health Organisation, Hunger Project, and Ghana Traditional Caterers’ Association.

I once again wish to welcome you all to this workshop, and I hope all the foreign delegates are having their fair share of the proverbial Ghanaian Hospitality.

Thank You.

2.3 Keynote address by the Minister, MEST

Mr. Chairman

Director-General, CSIR

Deputy Director-General of CSIR-INSS,

Directors of Institutes, Agencies, Departments and Organizations,

Participants from NRI - UK and Accra Office,

Invited Guest,

Distinguish Members of the Press,

Distinguished Ladies and Gentlemen.

The dramatic growth of urban populations in the country provides both opportunities and risks for resource poor groups in our urban and suburban environments. A feature of the urbanization process has been the development of informal food supply systems.

This is typified by the increase in ready-to-eat food prepared and sold by street-vendors in urban areas. The role of this sector in the urbanisation process and the urban economy reflects the way of life and the survival and coping strategies adopted in most African cities. Rapid urbanisation is breaking down traditional family ties throughout the world and the street food sector is widely understood as an inevitable phenomenon tied to urban growth. This urbanisation and the associated social and structural changes have caused the

demand for street food to increase. Longer travelling times between living and working places is likely to lead to further increases in demand. Accra with a current population of about 3 million is hampered by an inadequate transportation system linking the sub-urban areas with the commercial and industrial centres where men and women work. Street food accounts for a part of the daily diet and so contributes towards meeting nutritional requirements, although the contribution varies. Urbanisation and migration have changed the patterns of living and eating. The easy availability of foods in the streets of cities and small towns has helped workers cope with long period of absence from home. Street foods contribute significantly to food security and nutrition and are physically and economically accessible to most people. Street-vended food contributes significantly to the food security of those involved in its production, particularly suppliers of raw produce, food processors and vendors, as well as providing a readily available source of cheap nutritious food for consumers. It is an activity that provides employment to many, while providing nutritious, inexpensive and tasty food to millions of working women, men, children and students.

There is, therefore the need for development practitioners, program planners and us the policy makers to take another look at food insecurity and malnutrition, which hitherto were considered as rural problems. I believe this workshop would lead the way in exploring the importance of Street-vended food to our livelihood. Fred Allen once said that a *“conference is a gathering of important people who singly can do nothing, but together decide that nothing can be done.”* I am sure that in our case we would find solutions to all the problems at stake.

In contrast to these potential benefits, it is also recognized that street foods are produced by those with limited knowledge of food safety practices and in environments that can compromise the hygienic preparation, storage and sale of the food. Street food vendors are frequently unlicensed and untrained in food hygiene or sanitation and work under very crude and unsanitary conditions. This can cause food poisoning. There is growing concern about fruit and vegetables as a source of infectious food-borne disease. A further risk may occur from the use of foods and raw materials that contain chemical contaminants. In Ghana and other countries in Sub-Saharan Africa, horticultural crops play a significant role

in street foods both in the fully prepared and semi prepared state. Little information has been gathered on the occurrence of and risks incurred from biological, biochemical and physical contaminants and more specifically on practical means of overcoming the problems.

I should admit that in spite of this widespread economic activity, street foods have tended to be overlooked by many development planners, policy makers as well as researchers as it pays little or no tax and the nuisance it creates in terms of congestion on our streets. It is refreshing to note that this conference has brought together key stakeholders involved in food and environmental policy, food standards, quality enforcement and research to agree on recommendations to improve food safety and quality of street foods by these stakeholders without further research; and to identify and agree on areas where new knowledge is required to ensure impact on livelihoods of target beneficiaries. This should include the preparation of a strategy for the development and validation systems for improving the safety and quality of street foods that are technically, economically and socially viable.

I should take this opportunity to thank the NRI and their Ghanaian counterparts, especially the CSIR – Food Research Institute for their foresight in conducting this study. It is my hope that you would have a fruitful workshop.

3. Plenary Section

3.1 Introduction of DFID/NRI/FRI Street-vended foods project – objectives, activities and overview (Dr. P. N. T. Johnson (CSIR-FRI))

Rationale

- ◆ Street foods provide livelihoods for producers of raw materials, processors and vendors.
- ◆ Sustainable increase in income from street foods jeopardised by perceived problems of food safety, poor waste management and lack of market development.
- ◆ Social, economic and food safety analysis of street food sector to identify constraints and opportunities.
- ◆ Identify areas for improvement - livelihoods in the street food sector sustainable and food safety concerns resolved.
- ◆

Outputs and Activities

Output 1. Economic, social value and safety of street-vended foods

Output 2. Recommendations on food safety risks and identify areas where new knowledge is needed.

Activities undertaken to achieve the outputs

Output 1

- ◆ Select case study products and vendors.
- ◆ Establish supply chains for raw materials to the street-vendor.
- ◆ Assess significance of street-vended products to people in the supply chain and street vending and to the economy as a whole.
- ◆ Assess the food safety risks

Output 2

Organise workshop for key stakeholders.

4 Scientific Sections

4.1 Socio-economic survey of street-vended foods in Accra, P. Obeng-Asiedu, Dept of Agric. Economics., University of Ghana

BACKGROUND

- URBANIZATION
- STREET FOODS
- PROBLEM
-

SPECIFIC OBJECTIVES

- To establish the socio-economic characteristics of the street food vendors
- To establish the size and supply chain of the street food vendors
- To estimate the incomes generated by these street food vendors
- To estimate the employment generated by the food vendors

JUSTIFICATION

- IMPORTANCE
- INCOMES
- EMPLOYMENT

METHODOLOGY

- DATA COLLECTION
- SAMPLE SIZE
- MINI CENSUS

FINDINGS

- NUMBER OF VENDORS
- ORIGIN OF VENDORS
- EDUCATION AND MARITAL STATUS
- EMPLOYEES AND TAX PAID

- COSTS AND REVENUE/PROFIT

CONCLUSIONS

- SIZE (15,000 vendors employing more than 60,000 people)
- ORGANIZATION
- RECOMMENDATIONS

TAXES

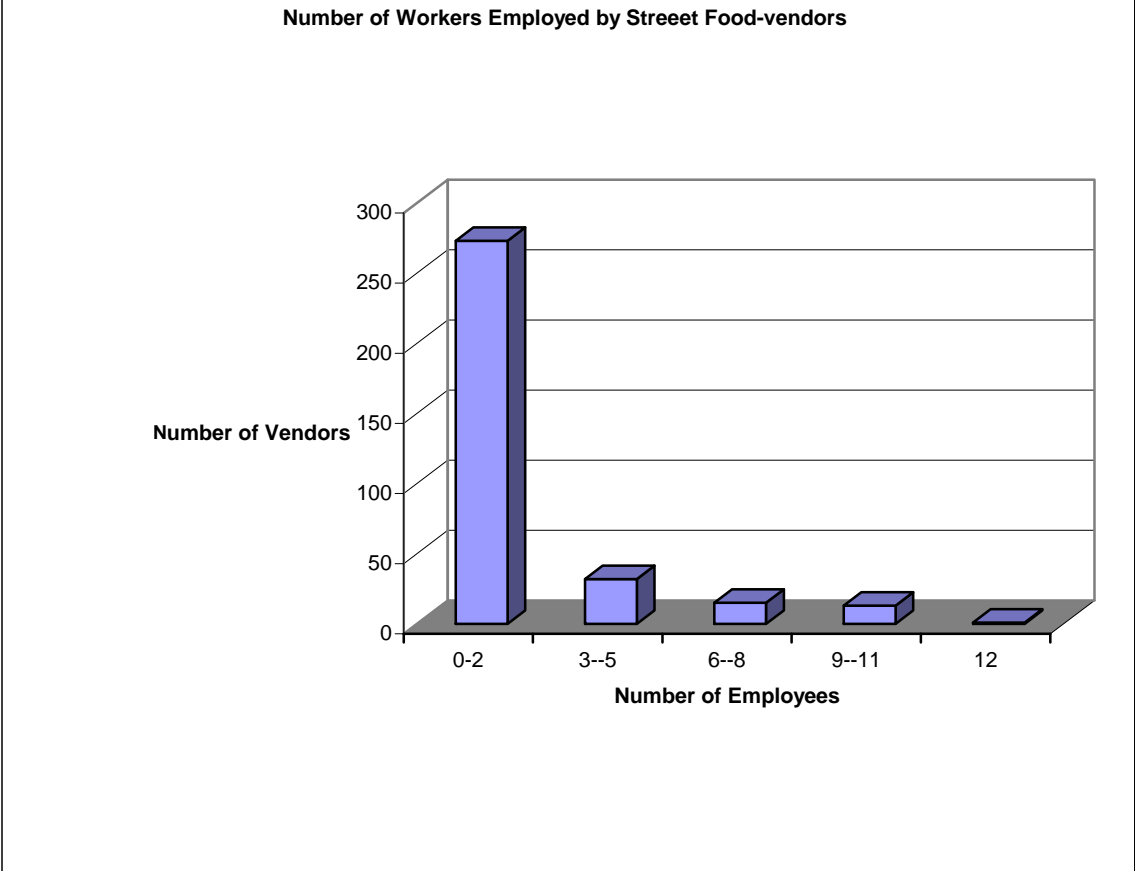
MEAN MONTHLY TAX PAID	¢7000 (\$2.5)	
DAILY AVERAGE TAX	¢1000 (\$0.40)	
PAY TAX		54.5%
RANGE	¢6000 (\$2.24) TO ¢25000 (£9.28) PER MONTH	
SFV ASSOCIATION		25%
OPERATE ON LICENCE		40.6%
SFV ASSOCIATION PAY TAX		95%
COSTS AND REVENUE/PROFIT		

ITEM	COSTS/BATCH	SALES/BATCH
RAW MATERIALS	10200	22700
OTHER INGREDIENTS	4000	
FUEL	1600	
TRANSPORT	200	
LABOUR	1500	
TAX	200	
RENT	1000	
TOTAL	18700	

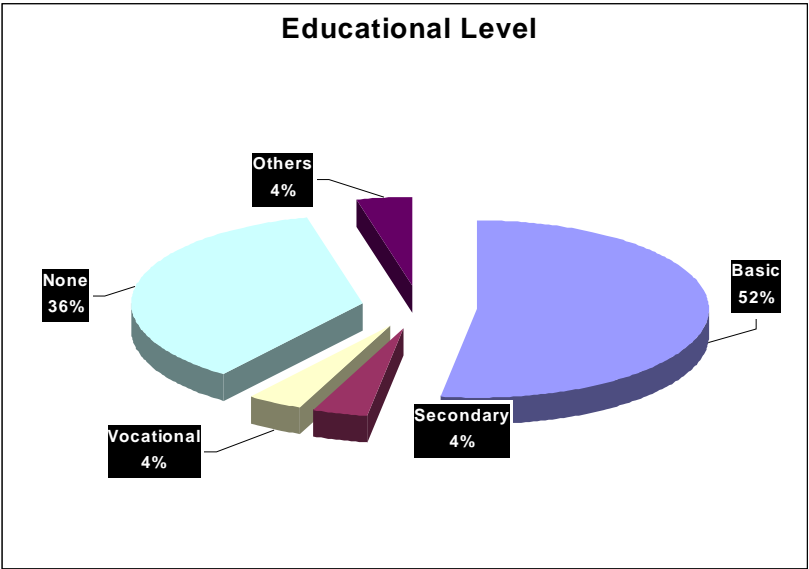
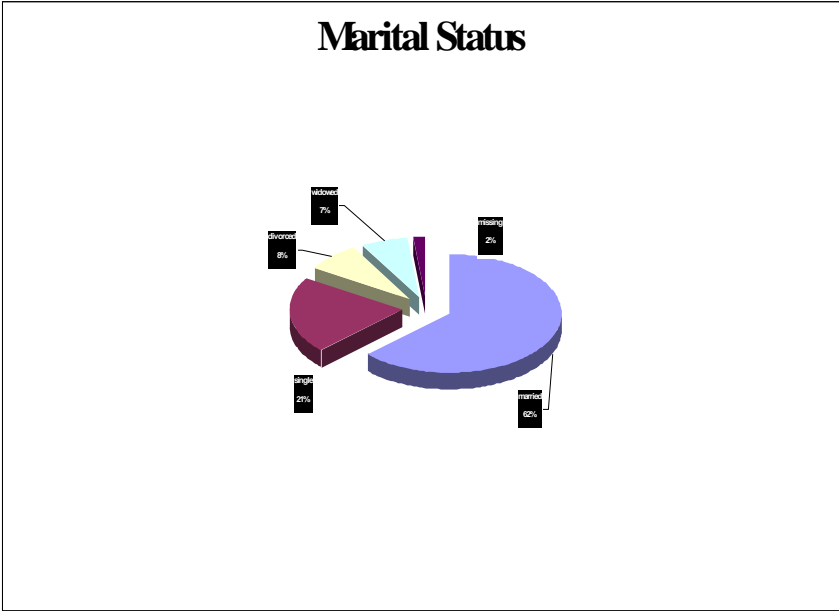
SECTOR PROFIT /YEAR = \$24 million

SECTOR TURNOVER / YEAR = \$114 million

EMPLOYEES



MARITAL STATUS



Discussion

Mr. J.T. Manful of the Food Research Institute expressed the hope that the \$24m / year profit which translates to over an average \$100 / month per vendor is accurate. The presenter assured him of its accuracy. He also expressed the view that if only 30% of the vendors are from Accra, the word 'most' cannot be used. The presenter agreed.

Mr. A. Ansong (PRO) of the Ghana Traditional Caterers Association said since members of their Association pay tax as the research revealed, he suggested that it should be recommended to government to make membership of their Association compulsory. He was however reminded that it would be contravening the National Constitution.

Mrs. Agnes Osei-Yaw remarked that, the educational levels of vendors are 52% for basic and 36% with no education, which means when educating the vendors the different categories should be considered.

4.2 Street-vended foods and Hygiene - Dr. R. Myhara, NRI

Background

He started his presentation by giving an overview of the previous work done in the area of microbiological status of street-food vended in Accra as reported in the report of the Street Food in Ghana (SFIG) 1994-1997 UNDP/FAO/ Ghana Standards Board. In that report, three phases of work are identifiable:

In Phase 1, the socio-economic and food safety aspects of foods vended in Accra were discussed. Some contamination of foods by bacterial pathogens were evident. Areas of infrastructure needing improvement were recommended. In Phase II, a HACCP plan was designed for implementation. Phase III & IV recommend training in implementation of HACCP plan as well as the final report.

Present Findings

Microbiological analysis carried out on Waakye, Fufu and salad samples taken in 8 zones in the Accra Metropolitan Area. The zones are 1= Kaneshie, 2= Nima; 3= Odorkor; 4= La 5= Accra Central 6= Dansoman; 7= St Johns and 8= Madina.

Dr Myhara compared the findings of this work with the previous studies. He went further to explain the severity and/or implications of the findings by giving an overview of the source and dangers of the main micro-organisms detected.

On the presence of the *bacteria, E-coli*, he explained that its presence is an indication of the presence of faecal contamination, contaminated water, sewerage, food workers in contact with the food product, flies or other insect pests and certain strains of pathogens.

2. On *Staphylococcus aureus*, he explained that these are found on the skin and on mucous membranes (e.g. the nose). Though they produce toxins and causes food poisoning, they are not considered dangerous.

3. *Clostridium perfringens* and *Bacillus cereus*

He explained that these are found everywhere. Though they produce toxins and causes food poisoning, they are not considered dangerous

4. On the presence of *Salmonella spp.*, Dr Myhara explained that this indicates faecal contamination, contaminated water and/or sewage. Food workers in contact with food product, fliers or other pests, most species are pathogenic and therefore can be dangerous when ingested.

Discussion

Prof. Ayensu wanted to know optimum levels of the microbes considered as safe in foods. It was explained that the levels vary from one microbe to the other and even vary with the type of food.

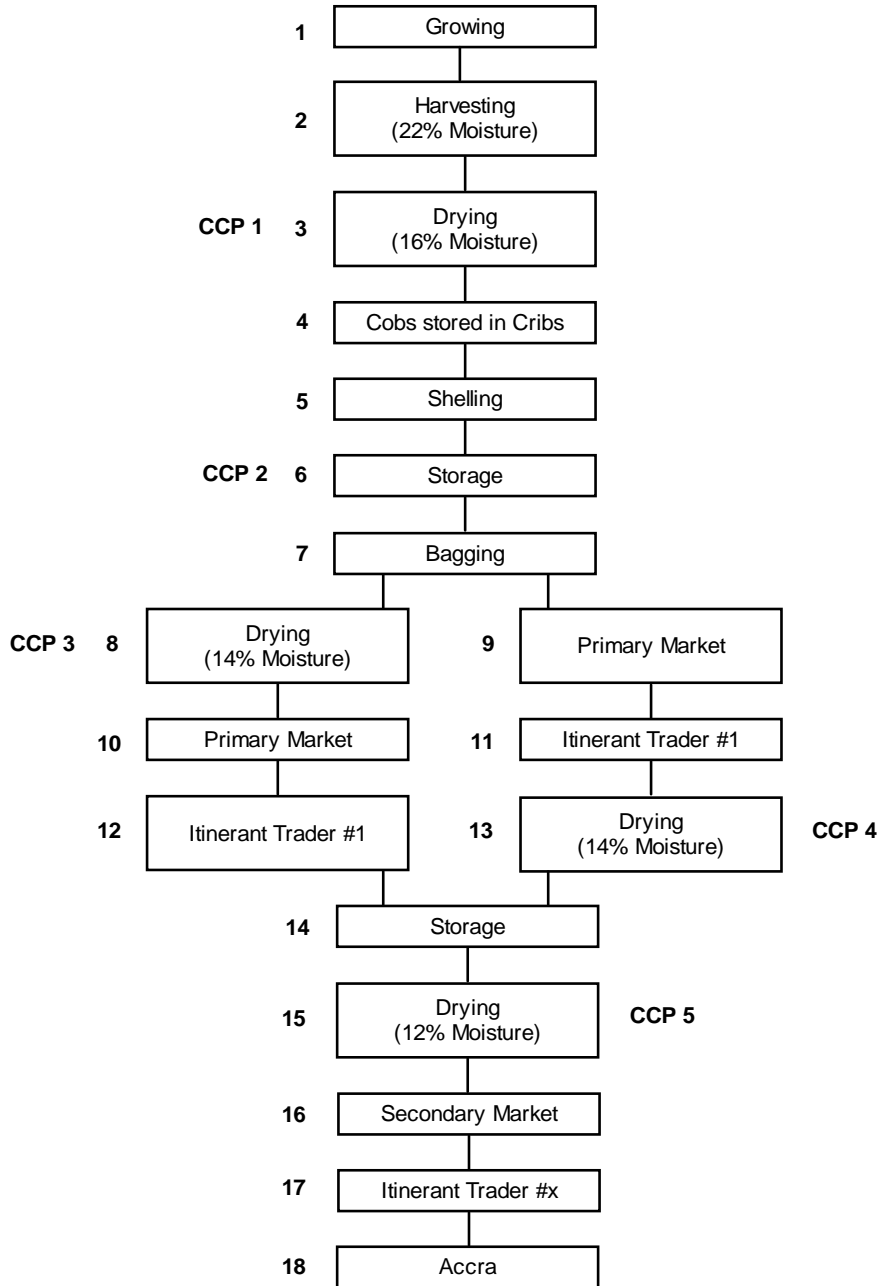
Mr J. Manful, FRI, argued that from the food samples chosen (*fufu, waakye* and salad), it looks like they are “easy targets” for finding contamination, he wondered why the researchers did not look at foods served very hot like *banku, Kokonte* etc. In response, it was explained that the project is a continuation from where a previous one by FAO/ESB

ended. Granted that enough funds were available more foods would have been studied especially food served hot.

Mr. J.A. Laryea, Metro Public Health Department, remarked that training should be paramount and should be hand in hand with the provision of infrastructure. The Chairman agreed with him. He however said, since the questioner is from AMA, it would be very good if all the vendors were licensed.

4.3 A HACCP approach to the prevention of mycotoxins through moisture control.
Dr. P. N. T. Johnson, CSIR-FRI

Figure 1. Maize production



Discussion:

Dr. W.A Plahar, of FRI asked whether they could indicate the severity of risk associated with each CCP described. In response, it was stated that offhand figures could not be

given, however, at every CCP described there were high levels of microorganisms. The CCP described mostly during the storage process where the moisture content is expected to be minimal.

Mr. J. Manful FRI made the following suggestions:

- that every storage point be a CCP as there could be problems with Insects and rodents.
- that as much as possible, the moisture should be reduced to as low as possible once it has been shelled.

It was agreed that shelled grains should have very low moisture content for proper storage.

Mr. Kwamina Van-Ess of Food & Drugs Board pointed out that steps 8,9,13, and 15 of the HACCP are controlled by migrant/alien operators from Mali and Burkina Faso. He therefore wanted to know whether in the course of studies notice was made of any measures which MoFA had put in place to educate these operators for example principles of good warehousing etc. to minimise moisture content level of maize. It was explained that good warehousing has been taught of by MoFA, though on a very small scale.

4.5 Heavy metals, pesticides and mycotoxins in street-vended foods

K. Tomlins, NRI

Background

SFSIG 1994 – 1997

- ◆ Contaminants (heavy metals, pesticides and mycotoxins) not included in the programme
- ◆ Mentioned as a hazard

Heavy metals

- ◆ Lead above FAO/WHO limits in oranges and avocados in Kumasi (1994)
- ◆ Lead and cadmium above FAO/WHO limits in street foods in Dar es Salaam
- ◆ Lead in street foods in Bangkok

Pesticides

- ◆ Found in street foods in Bangkok
- ◆ FRI survey under NARP funding – farmer have poor knowledge of use of pesticides

Mycotoxins - found in street foods in Bangkok

Present Study

- ◆ 36 samples collected from street food vendors in 8 zones in Accra (waakye, fufu and salad)
- ◆ 14 raw material samples sampled from primary and secondary markets in Techiman, Kumasi and Tamale (rice, maize, cowpeas)
- ◆ 9 vegetable samples from the Densu river area

Hazards

Lead

- ◆ Children most at risk. Learning and behaviour affected even at low blood lead levels
- ◆ FAO/WHO maximum limit in cereals is 0.2 mg/kg

Cadmium

- ◆ Can affect kidney function
- ◆ FAO/WHO maximum limit in cereals is 0.1 mg/kg

Cadmium

- low levels detected in street food samples

Pesticides

- ◆ Organochlorine pesticides are environmental pollutants. Use reduced since 1970's
- ◆ Organophosphate pesticides have increasingly replaced organochlorine pesticides.
Occurrence in food not common apart from contamination
- ◆ Can cause illness

Mycotoxins

- ◆ Toxic substances produced by moulds
- ◆ Possible carcinogens
- ◆ Occur in grains and nuts if mould growth

Mycotoxins

- ◆ very low levels detected in waakye and fufu – not a hazard

Recommendations

Potential critical control points (HACCP)

Heavy metals

- ◆ Air (leaded fuel)
- ◆ Water (environmental pollution & irrigation)
- ◆ Industrial sources (lead battery production, smelting, disposal of lead waste)
- ◆ Soil
- ◆ Cooking equipment and utensils

Pesticides

Good Agricultural Practice

- ◆ Farm (extension, monitoring)
- ◆ Storage (extension, monitoring)
- ◆ Food preparation & display on vendors stalls Mycotoxin
- ◆ Control of moisture at the farm, storage and transportation

Discussion:

In contributing to the discussion Mr. K. Acheampong of the Ghana Standards Board said, the small-scale manufacturers of aluminium cooking pots use scraps for this business. In the course of smelting, lead from dry cell batteries are added to lower the melting point of the aluminium in order to cast the pots. He added that when such pots are used for cooking, there is the possibility of leaking of lead to the food. Since most sellers use such pots, he countered that the high lead content in the waakye may be as a result. It was therefore agreed that the small-scale manufacturers should be educated on the hazards associated with the use of some of the scraps. It was suggested that the SCIR and other stakeholders should find a technology that will achieve better result without the associated risks.

Dr. W.A. Plahar of the CSIR-FRI wanted to know if the high levels of the heavy metal in waakye are from the cooking. In response the research team admitted that, it is true that

leaching from the pots is a big factor but the raw materials for the preparation of *waakye* also contributes to a very large content.

Mrs Marian Adum-Atta of the Metro Education Office remarked that the waakye vendors add some colouring agents to the waakye during preparation to give its characteristic colour and this may also contribute to the high levels of contaminations.

4.6 Improvements to street food vending in Accra, J. Laryea, Metro Public Health Dept., Accra Metropolitan Assembly

Background

The street food industry in Accra like many others in other parts of the world has a long tradition. Because of socio-economic changes, this industry has experienced a rapid growth. The activities of the operators not only provide employment and income but serve as a source of ready-to-eat meals which are accessible and also affordable to the poorest. Important as these foods are in the food supply industry, however, street vended foods are also recognised as a possible hazard to health.

4.6.2 SCOPE

This paper looks at the historical perspective and the measures that have been put in place in the Accra Metropolis to improve this vibrant sector of the economy.

4.6.3 DEFINITION

Street foods have been defined as ready-to-eat foods and beverages prepared and/or sold by vendors especially in streets and other public places.

4.6.4 HISTORICAL BACKGROUND

The commencement of street food vending in Accra has not been fully documented.

Accra, like most other West African Cities has strong tradition associated with the type of foods eaten. Methods of preparation are also deep rooted in tradition.

4.6.4.1 Pre-Independence - Population

Before independence, Accra was sparsely populated and the people were living in compound houses. Meals were therefore prepared and eaten at family than at individual levels.

4.6.4.2 Pre-Independence Occupation

Fishing was the mainstay of the people of Accra in those days.

However, there were a few who were engaged in cash crop farming activities at the periphery. And very few were in trading ventures.

Here again there was enough time for meals to be prepared and consumed at family levels.

4.6.4.3 Pre-Independence Family Tradition

Some families were and are traditionally associated to certain foods that are prepared in large quantities for family's consumption and also for sale to other families. Food vending activity then was in the form of food being prepared at home and sold on take away basis.

4.6.4.4 Post Independence

Ghana's Independence in 1957, promoted industrial development and a general improvement in health and education, bring about both vertical and horizontal mobility of its citizens. The source of employment which was mainly indigenous agriculture and petty trading was diversified into other fields. People had to work away from home and the traditional environment. Those who could not carry food to their places of work had to be catered for. This gave birth to cooked food, snacks and fruits being sold to customers by food vendors and hawkers.

With increasing urbanisation and migration to the major cities and towns for "white collar" jobs, and Accra is no exception, one now finds a variety of traditional foods in the cities.

And although certain foods are traditionally associated with some ethnic groups, these products have now become important foods for other groupings as well. Others also came along into the cities and towns with their traditional foods. And all these needs have to be met.

4.6.4.5 Recognition

In view of the above, the street food industry has grown rapidly. Hawkers and vendors can be observed around offices and factories, schools, markets, construction sites, beaches, lorry stations, commercial centres and along virtually every street in the metropolis of Accra. The industry has now been recognised as an informal sector of the economy.

4.6.5 IMPROVEMENT MEASURES

The following improvement measures are in place:

4.6.5.1 Regulatory Control

Realising the significant contribution to the nutritional needs of a large proportion of the population, the preparation, wrapping and sale of street food is now controlled through BYE-LAWS, LICENSING and REGULAR INSPECTION by Government Departments and Agencies to ensure food safety to all consumers.

4.6.5.2 Training of Food Inspectors

Regular inspections of food premises and education of food vendors has been recognised as one of the measures to ensure improvement of the quality of street foods. To ensure this, food quality control measures have been factored into the training programme of the Food Inspectors of the Metropolis.

4.6.5.3 Collaboration

One other measure that has been recognised to enhance street food safety is the collaboration of all agencies that operate in the food industry. This has been found in the establishment of the Food and Drug Board. A forum where all agencies in the food

industry, including street food can discuss issues. An indication of improvement in the street food vending activity.

4.6.5.4 Private Sector Involvement

The private sector has also lend a hand in the improvement of the street vended foods. This has been in the form of sponsorship for production I.E. and C materials for training and actual training of street food vendors.

4.6.5.5 Street Food Vendor Association

Another area of improvement in the street food vending activity is the formation of association by the street food vendors. Through this association, training in personal hygiene, safe handling and preparation and clean environment is provided to the street food vendors. The association also offers a forum for the food vendors to share ideas and discuss issues of common concern. It offers an opportunity for credit facilities and other benevolent activities. This enhances improvement and ensures food safety.

4.6.5.6 Consumer Association/Education

Even though Consumer Association will contribute in no small way to the improvement of street food, the formation of the association has been an up hill task.

However, the education of consumers as a tool to enhance improvement of street food, is an on going activity by the Metropolitan Food inspectors to organised groups. These include Schools, Religious Organisations, Benevolent Societies and sometimes to the general public in the form of radio or television programmes.

4.6.6 CONCLUSION

On the whole, there has been an appreciable improvement in the street food vending activity.

Discussion:

Mr. Patrick Obeng-Asiedu of the Agric Economics Department of the University of Ghana said in their survey, space and harassment was a problem and the fact that 40.6% of the vendors operate on licence; he wanted to know what the AMA was doing to correct the situation.

In his response Mr. Laryea said AMA provides specific space for licensed vendors, however most do not conform to the rules and misjudged the monitoring by AMA of their activities as harassment.

Dr. P.N.T. Johnson of CSIR-FRI pointed out that during their survey it was noticed that most of the vendors came out to work in the evening. He therefore wanted to know whether AMA does monitor the activities of these nocturnal vendors. In his response, Mr. Laryea said AMA does not work in the evenings and weekends. He however, said the vendors Association are used to monitor members.

Mr. E.A. Ansong, PRO of the GTCA suggested that AMA needs to train some of their members to become trainers in health Education, food handling, food preparation and sales. He added that the AMA should also take a critical look at the way raw materials are handled in the market- where items are sold on the floor.

Mr. Kwamina Van-Ess, of the Food and Drugs Board, suggested amendments to its bye-laws on street vending of the issue. This he said will help or assist in providing an all embracing bye laws. Mrs. Marian Adum-Atta remarked that the consuming public should be educated on what is food for them to buy.

4.7 Health-related problems with street foods in Accra. Overview of recent cases

Dr. A. Arde-Acquah, Metro Public Health Director

1.	DISEASES	Morbidity and Mortality
2.	NUTRITION	Values, Food Additives, Fast Foods
3.	DRUGS	Off the Counter, Self Medication, Herbal Drug Peddling in Public Vehicles
4.	ENVIRONMENTAL SANITATION	Littering (Combs, litter, polythene bags, paper wrappers, take-away packs
5.	WATER	Availability, safety, affordability <u>Purposes</u> Drinking Cleaning of Plates, Hand Washing Cutlery, etc.
6.	GROUP EATING	Celebrations – Out-doorings, Funerals, School children, football, athletics, sporting events, workers (office, factory, etc.)
7.	MATERNAL AND CHILD HEALTH PROBLEMS	
8.	HEALTH EDUCATION	On Foods On Personal Hygiene for Food Providers Handlers
9.	TREATMENT OF COMMON DISEASES DUE TO IMPROPERLY HANDLED FOOD	
10.	INFORMATION GENERATION	

HEALTH - RELATED PROBLEMS WITH STREET - FOODS IN ACCRA

METROPOLIS:

1995 - 2000 (HALF YEAR)

Disease	1995	1996	1997	1998	1999	2000 up to Half Year
Diarhoea	2575	8217	10191	16189	17046	8883
Cholera	1028	276	249	225	2937	1007
Enteric Fever	744	981	1585	1128	1624	705
Infective Hepatitis	311	351	298	251	235	108
Intestinal Worms	7390	7565	5951	7447	6558	3086

**CHOLERA INCIDENCE IN ACCRA METROPOLIS COMPARED WITH
DIARRHOEA 1993 - 1999**

Year	Cholera	Diarrhoea
1993	801	39
1994	504	308
1995	1028	2575
1996	276	8217
1997	249	10191
1998	225	16189
1999	2936	17046

Below is cholera incidence by Sub-Metro.

THE INCIDENCE OF CHOLERA IN ACCRA BY SUB-METROPOLIS 1997 - 1999

Sub-Metro	1997	1998	1999
Ablekuma	122	142	1620/23 deaths
Ashiedu Keteke	33	41	340
Okaikoi	53	24	590
Ayawaso	8	11	53
Kpeshie	4	3	143
Osu Clotey	7	4	190
Accra Metro	249	225	2936/23 deaths

1999 C/F = 0.8%

CHOLERA INCIDENCE IN ACCRA: 1999 BY QUARTERS

	1st Qrt	2nd Qrt	3rd Qrt	4th Qrt	Total
Ablekuma	891/12	135/2	318/2	276/2	1620/23
Ashiedu Keteke	244	24	65	7	340
Okaikoi	289	109	182	10	590
Ayawaso	53	0	0	0	53
Kpeshie	109	11	18	5	143
Osu Clotey	80	52	36	22	190
Accra Metro	1666/12	331/2	619/2	320/2	2936/23

CHOLERA INCIDENCE ½ YEAR 2000

Sub-District	J	F	M	A	M	J	Total 1st Quarter	2nd Quarter	Total
Ablekuma	90	101	101	37	40	87	292	164	456
Ashiedu Keteke	3	24	15	9	6	7	42	22	64
Okaikoi	96	63	79	60	65	107	238	232	470
Ayawaso	0	0	0	11	0	2/1	0	13/1	13/1
Kpeshie	0	0	0	0	0	4	0	4	4
Osu Clotey	0	0	0	0	0	0	0	0	0
Accra Metro	189	188	195	117	111	207/1	572	435/1	1007/1

½ Year C.F. = 0.1%

CHOLERA

Though the efficient disease surveillance system put in place was able to predict the cholera incidence in the Metropolis in 1998, and got the Metropolitan Health Administration on its toes, it was not able to prevent the occurrence in 1999. From early 1990s cholera cases only accounted for about 49% of the cases reported from 1993 to 1999 in the Metropolis. Below are the figures reported in Accra Metro.

**CHOLERA INCIDENCE IN ACCRA METROPOLIS COMPARED WITH
DIARRHOEA 1993-1999**

Year	Cholera	Diarrhoea
1993	801	39
1994	504	308
1995	1028	2575
1996	276	8217
1997	249	10191
1998	225	16189
1999	2936	17046

There may be an increase in the cases of diarrhoea reported in the Metropolis due to the poor socio-economic status of the city, but the rapid incline trend of the disease does not indicate the rate of increase, but a revelation of the impact of educational campaign embarked upon by the Metropolis targeted towards the Records officers in the institutions to insert diarrhoea onto the CDI form.

Discussion:

Mr. E.A. Ansong PRO of the GTCA pointed out that, out of 600 members of their association surveyed, about 35 % were found to be suffering from typhoid. He therefore wanted to know how it is acquired and effectively will the association be able to prevent it spread by customers and vendors also here.

In response Dr. Arde-Acquah said the disease is contracted from sewage. He therefore advised that hands should be properly cleaned before eating and after visiting the restroom. He said the only way to prevent the disease is by practicing food hygiene and suggested that vendors must be educated on simple hygiene.

Mrs Lydia Kwasitsu of MOFA advised that vendors must desist from the habit of using only one napkin for all their customers; it is one possible means of spreading typhoid.

4.8 Organochlorine pesticide residues and heavy metals contamination in some farming area in the Ashanti Region Dr. Osafo Acquah, KNUST

ORGANOCHLORINE PESTICIDE RESIDUE

TABLE 18
Mean pesticide residue level in water (ug/l) at the various sampling sites with ranking score (RS)

RIVER SITE	ORGANOCHLORINE COMPOUNDS											RS
	DDT	HCB	Endo-sulfan I	Endo-suifan II	Lindane	DDD	DDE	Dieldrin	Aldrin	Endrin	235 TCB	
Atwetwe (AT ₁)	0.567	4.545	0.001	ND	ND	ND	ND	ND	ND	ND	ND	8
Atwetwe (AT ₂)	0.477	3.629	0.001	ND	ND	ND	ND	ND	ND	ND	ND	10
Nkotodwe (NK ₁)	0.344	2.260	ND	ND	ND	ND	ND	ND	ND	ND	ND	15
Nkotodwe (NK ₂)	0.120	0.299	0.001	ND	ND	ND	ND	ND	ND	ND	ND	18
Ehuru (EH ₁)	0.576	7.132	0.002	ND	ND	ND	ND	ND	ND	ND	ND	3
Ehuru (EH ₂)	0.342	6.247	ND	ND	ND	ND	ND	ND	ND	ND	ND	12
Afrancho (AF ₁)	0.395	5.616	0.002	ND	ND	ND	ND	ND	ND	ND	ND	9
Afrancho (AF ₂)	0.401	1.578	0.002	ND	ND	ND	ND	ND	ND	ND	ND	17

ND Not detected

The mean accumulation of pesticides in the different sampling sites may be denoted as EH₁ > at₁ > AF₁ > AT₂. EH₂ > NK₁ > AF₂ > NK₂ HAD the lowest accumulation of pesticides in the saters of the rivers.

Discussion:

Mrs Lydia Kwasisu of MoFA remarked that DDT and other chemicals mentioned in the report have been banned. But because of the low prices the farmers go in for them. She pointed out that copper-based fungicides are widely used by tomato growers even when the crop is ready for harvesting. She attributed this to the course of high levels of copper in food-crops from the Agogo area. She also mentioned that ‘*cocobre*’ has been used by tomato growers to hasten the ripening of the tomato fruit and therefore contributes to the high levels of heavy metals in the fruits.

Mr. K. Acheampong of GSB wanted to know whether the operations of small-scale miners is a contributory factor to the high level of mercury in tomatoes from Agogo, since Agogo is very near to Konongo, a mining town.

Dr. Acquaaah agreed with Mr. Acheampong but asked that the pesticides and fungicides used in farming activities also contribute to the high level of mercury contamination.

4.9 Improvements to street food vending in Ghana – A historical perspective A. Ntiforo, Chief Scientific Officer, Ghana Standard Board

Background

In Ghana as well as in most African countries, street foods, which are ready-to-eat foods and beverages prepared and/or sold by vendors especially on streets and other similar public places (1), tend to have an enormous impact on the urban food supply, economically, socially and nutritionally. People of all ages and from different social and educational backgrounds depend, one way or the other on street foods because they are comparatively cheap, varied, usually traditional, convenient, available when required and often tasty (2).

In many instances the street food business is started with minimum capital and little expertise (1). This allows for the participation of a lot of women who generally tend to be unskilled in the developing countries. With very little overheads and the use of cheap and probably low quality raw materials, street food vendors can provide basic foods at a lower cost than restaurants.

Although the annual turnover involved in the street food business in Ghana has not been assessed, it is believed to be relatively high since large amounts of agricultural produce are utilized in this informal sector. Examples of agricultural produce used extensively are cassava, plantain, maize, rice, yams, fresh fruits and vegetables and livestock. It has been observed that the patronage of street foods is on the increase at those urban centres where population densities are high and economic activities are varied.

The heavy dependence on street foods by Ghanaians requires that good quality raw materials are used and that the foods are properly prepared, handled and sold under hygienic conditions for the assurance of good health. Unfortunately, majority of street food producers/vendors and consumers are ignorant of the acceptable and safe food handling practices. Further, lack of appropriate consumer education does not allow street food consumers to make demands that would compel the producers to come up with safe foods.

Notwithstanding the important role that the street food sector plays in the economy and health of the nation, it has so far not been accorded the recognition that it deserves. As a result, problems associated with street foods; especially, safety aspects, have not been properly addressed. This state of affairs has been brought about by the fact that there is not enough data on the subject which may be used by Government to plan for the Street Food Sector.

An FAO sponsored Inter-country Workshop on Street Foods in Africa which was held in Accra, Ghana from 27th April to 1st May, 1992 with participants from thirteen (13) English Speaking African countries helped in creating awareness on the immense contribution that street foods could make towards Ghana's economic development and the health of her people.

The various agencies concerned with street foods in Ghana work independently of each other. The Bye Laws governing the preparation and sale of street foods in Ghana are barely enforced for various reasons some of which I believe, will come up for discussion during this Workshop.

Coupled with these shortcomings is the fact that data on health, social and economic significance of street foods are very limited.

Although street foods are important in providing employment and generating supplementary income for the family, the poor handling and storage techniques as well as improper hygiene and sanitation practices adopted in the sector, could cause food adulteration and contamination resulting in possible health hazards to the consumer (3). The fact that there are only a few reported cases of food poisoning in the country does not rule out the potential health hazards that street food consumers are exposed to.

SURVEY ON STREET FOOD SITUATION IN GHANA

In the light of the foregoing Ghana Standards Board felt the need to get some relevant agencies to work together to identify some of the main problems of this informal food sector. Between January, 1995 and December, 1996 a survey on the Street Food Situation in Ghana was sponsored by UNDP and executed by FAO. The survey was implemented by the Ghana Standards Board in collaboration with the Department of Nutrition and Food Science, University of Ghana, the Food Research Institute and the Medical Officer of Health Department of the Accra Metropolitan Assembly.

The main objectives of the survey were the following:

- (I) To find out the current state of the Street Food Business in Ghana;
- (ii) To determine the major problems that militate against the production and delivery of safe street foods; and
- (iii) To make appropriate recommendations for improving the Street Food Business in Ghana.

The survey was conducted in five (5) phases over a period of twenty-four (24) months: (January 1995 to December 1996) by a team of Scientists in collaboration with International consultants fielded by FAO.

The first phase concentrated on the review of the Street Food Situation in Ghana with special emphasis on various studies that have been conducted nationally so that specific issues not addressed could be handled.

The second phase concentrated on the social and demographic characteristics of Street Food Vendors and Street Food Consumers, Sanitation, Processing techniques and handling

practices adopted in the Street Food Business to identify the basic factors that affect the production and delivery of safe foods.

Phase three was devoted to studies on the processing and handling techniques for selected street foods to bring out the possible sources of contamination so that appropriate control measures could be developed for the guidance of Street Food Vendors.

The last two (2) phases covered educational workshops.

Phase IV was a PARTICIPATORY RAPID APPRAISAL Workshop where the local team and selected field workers were trained in the techniques of participatory rapid appraisal.

The acquired techniques were later used to cross check some of the results of phase III.

The workshop under phase V was organized to discuss results of the survey with social partners and stake holders in the Street Food Business in Ghana. Emphasis was placed on factors that affect the production and delivery of safe street foods and the involvement of NGO's in the provision of basic infrastructure for the Street.

II RESULTS OF SURVEY (SUMMARY)

A Review of Studies

A review of studies conducted on Street Foods showed that the various studies were limited in scope in that they dwelt on small sizes with regard to vendors, consumers and food types. Most of the studies were also confined to University campuses and surrounding areas. The major subjects of interest that were covered included:

- Historical Development of the industry
- Legislation
- Social and Economic aspects
- Production and Vending
- Infrastructure
- Safety and Nutritional value of the Street Foods
- Educational Workshops.

Recommendations were made-based on the findings, but these were never implemented because stakeholders were not directly involved neither were the findings passed on to the appropriate authorities.

B. Vendors

The survey revealed that majority of the Street Food Vendors (94%) were uneducated and unskilled women of low income levels who tended to have no formal training in good food production and delivery practices. These vendors have also not constituted themselves into well organized associations which could enable them develop codes for their business, access credit from the banks or constitute a forum for interaction with the food control agencies.

C. Infrastructure

The business lacked adequate infrastructure that could enhance food situation. Supply of potable water was inadequate. Inefficient and unreliable waste disposal system, inconvenient and unhygienic eating-places were some of the major infrastructural problems found.

During discussions at Workshops organized for them, the vendors indicated that they were prepared to pay for infrastructural services and formal training in good practices aimed at improving the quality and safety of street foods.

Time will not permit me to talk on all findings.

D. Hazard Analyses

The Vendors were not aware of the possible sources and causes of contamination resulting from raw materials acquisition, food preparation, storage during sale, handling and final delivery to the consumer.

Phase 3 was therefore devoted to the identification of hazards and assessment of risks associated with the preparation and delivery of selected street foods.

The outcome of the studies was to be used as the basis for introducing preventive and control measures to guide street food vendors to come up with good quality and safe foods.

The studies revealed that Excessive human handling during the preparation and sale of street food and the practice of holding the food under ambient conditions without complete covering during display and sale facilitated microbial contamination and proliferation. Raw materials for the preparation of street foods were found to contribute a potential source of microbiological contamination.

E. General Observation

The Street Food Vendors were particularly unhappy about what they described as harassment by officers of food control agencies. They claim these officers concentrate more on policing them instead in enforcing the out-dated bye-laws rather than creating the right conditions to enable the vendors do the right things at all times.

F. PATRONS OF STREET FOODS

Two major patrons were identified viz; Students and workers (mostly men) especially those in the low-income group.

The consumers were not quality conscious. It was therefore not surprising that they could not make demands that would compel the vendors to adopt production and handling practices to increase the quality and safety of foods they sell.

Unfortunately local authorities have also not provided appropriate and adequate infrastructure to help vendors produce and distribute safe street foods.

III GENERAL RECOMMENDATION

The Street Food Business in Ghana is very big. It should be recognized by Government/Local Authorities as a vital sector of the economy capable of providing cheap and nutritious foods to the ordinary man while generating revenue through taxes.

The report therefore recommended that all stakeholders in the Street Food Business should co-ordinate to develop strategic plans based on sustainable institutional framework to ensure the production and delivery of safe street foods in Ghana.

Discussion The paper did not attract any question, remarks or suggestions.

4.10 Problems faced by street food vendors in Accra, G. Apraku, GTCA

The Ghana Traditional Caterers' Association is happy that this topic is being addressed today.

I, stand on behalf of the Ghana Traditional Caterers' Association to thank the Organisers for this laudable programme.

It will be accepted by all and sundry that street food vending in Accra has reached an uncontrollable position and need a solution to stop it happening.

We the members in the Catering Industry, has taken the responsibility and welcome any benevolent Organisation to assist us.

When we speak of food vendors, it comprise the fufu seller, banku seller, waakye seller, koko, roasted plaintain, fried yam seller/tsofi and the rest, just to mention few.

The traditional caterers' has also observed that these food vendors comes in two groups:

- a. The permanent food vendors by the street, and the
- b. The moving food vendors.

The Ghana Traditional Caterers Association has over the years interact with the members and non-members through workshops, seminars and at conferences to educate them.

A search conducted by the association showed that these petty sellers along the street need to be habitated.

In simple terms they should be in a kiosk well covered with net and food being sold boldly written on them.

Experience has also shown that many people, due to time factor, are unable to reach the Chop Bars and Restaurants. They therefore tend to rely on food prepared by the street vendors. Most of these foods we believe are equally hygienic as others.

The Ghana Traditional Caterers Association has come of age and need assistance from both government and the general public to make the catering industry realise its potentials. Besides the humiliation, tidiness, constant cleaning of bowls and others we sometimes end up by losing our money.

Our problem at this juncture is to be assisted with a well-designed and identified kiosk within 100 to 300 distances to display our food.

We hope if all these conditions are resolved the street food vendor will have lesser problems.

Discussion

Ms Selina Fenteng of AMA asked what the GTCA is doing for their members and the steps being taken to bring non-association members into their fold. In response to this, Mr. Apraku said members are educated on basic hygienic practices on food handling. He added that members enjoy welfare benefits such as contribution towards engagement, funeral and other social activities. This also serves as an incentive in attracting new members.

Mr. P. Obeng-Asiedu asked about the numerical strength of the GTCA, and the total number of vendors who honour their tax obligation through the GTCA. The total strength was stated to be approximately 5000. However, the exact number of taxpayers could not be given.

Mr. J. A. Laryea of AMA asked whether the association wants the kiosk to be constructed or the design to be developed for them and on individual's basis or for the association. The GTCA representative said they wanted a common design and assistance for the construction

4.11 Street-vended foods in Accra: A worker's concerns and expectations. D. Asiedu, FRI

INTRODUCTION

With your permission, I wish to begin my delivery with a bit of back tracing. We are told it is extremely difficult to pinpoint the precise beginnings of human awareness of the safety of food preparations. The available information indicates that this knowledge may have been available in some designated era. The pre-scientific era may be divided into what has been called the Food-gathering period and the Food producing period. The food-gathering period covers the time from human origin over one million years ago up to Eight thousand years ago.

The food-producing period dates from about Eight thousand to ten thousand years ago and of course includes the present time. It is therefore presumed that the awareness of the safety of good preparations may have developed early in the food-producing period.

STREET FOODS

Please bear with me if I have to define street foods again should there be any inferences from the early presenters on this programme. Street foods according to FAO Food and Nutrition Paper Source, are ready-to-eat foods and beverages prepared and sold by vendors and hawkers especially in streets and other public places. Though the topic I should deal with places emphasis on my concerns and expectations, it is also worthwhile acknowledging some factors in brief accounting for the evolution of street foods and their most likely bearing they may have on my concerns and expectations.

It is quite evident to us that street-foods are well suited for small-scale production and also, production by women for some of the following reasons:

1. Small capital investment is required
2. Raw materials are readily available
3. The technology involved is simple
4. No complex packaging is required.

5. There is always fast return on investment that is make the product and receive the returns from this investment all in one day.

Let me also add by mentioning that the clientele need for the services of street vendors have been necessitated by some of the following reasons:

1. The wife's inability to fulfil her traditional role of preparing the family's daily meals intake because of her involvement in other ventures to help raise the family's income.
2. The proximity factors that is workers not able to go home and cook and therefore assured of their mid-day meals.
3. Street foods seem "affordable".
4. Street foods comprise a large variety of cheap food to choose from.

CONCERNS

I shall begin addressing my concerns by posing the following questions;

1. Are street foods beneficial and affordable to the ordinary worker?
2. Are they safe Microbiological and Chemically?
3. Are they prepared hygienically and not constitute health hazards?
4. Are the nutritional values appreciable?

I think most of you here will agree with me that street foods are beneficial to the ordinary worker but whether affordable or not is also another matter. Without street foods admittedly, the ordinary poor urban worker cannot have regular meals because a single meal preparation constitute a greater expenditure in the areas of food ingredients (raw materials), fuel and the use of the appropriate cooking utensils - just think about preparing a meal of kenkey and you will understand what I mean. The unavoidable use of the services of the street food vendors by the identified category of works among others bring to fore my safety concerns.

LOCATIONS

Vendors find locations where there are lot of human activities irresistible to spot for their operations irrespective of the surroundings. I notice quite often with worry, the display of products by vendors at points close to open and unkempt drains.

I also noticed with disbelief a vendor operating a few meters away from a mountain of garbage dump.

These two examples are clear cases of poor sanitary environment with their attendant pollutants likely to contaminate food and their various receptacles with all kinds of pathogenic organisms and consequent health hazards implication. It has also been observed that the general sanitary condition of some of the utensils used in the preparation of street foods as well as the plates ,bowls and wrappers appear poor.

The manner we finally have our fufu in our bowls ready-to-eat seem to be unsatisfactory whether prepared at home or obtained from the “Chop-bar”. The pounding of the fufu especially on a large scale is the problem I know most people who take their fufu from the ‘Chop -Bars know it, the operators know it and the one pounding the fufu knows it but cannot be bothered.

How often are drinking water containers cleaned before water is replaced in them at some ‘Chop-Bars’,? poor quality water is a potential source of food borne disease. How frequently are the common hand drying towels replaced or changed at some of the Chop-bars,? What about the drinking cups? Do they go into circulation immediately without been cleaned after use by an individual?.

I also do worry about both vendors and customers picking products such as pastries and fried fish with their hands from open trays or glass boxes. Examples of poor hygienic practices are quite inexhaustible and can therefore not be dealt with entirely at this particular workshop.

NUTRITIVE VALUE

It is no secret that most of the raw materials particularly the vegetables and to some extent the main protein source of fish an meat used in street foods by some vendors appear to be of low grade quality in terms of nutritive values.

CHEMICAL FOOD POISONING

Increasing information regarding the harmful effects of mis-applied chemical pesticides have created the awareness among some workers. We were informed at a recent workshop, I participated in that pesticides used on crops find their way back to humans in

the form of what is called residues. These pesticide residues accumulate in the body and possibly lead to two ways of serious health effects namely Acute Poisoning and Chronic Poisoning.

The acute effects we were told are almost immediate and have symptoms such as headache, skin rashes, nausea, vomiting, blurry vision, dizziness, sweating, diarrhoea, unusual weakness, loss of concentration, difficulty in breath, convulsion, coma and death.

The Chronic effects are usually felt or seen after repeated exposures. The effects take a long time to appear and normally difficult to cure. Some of the symptoms include cancer, birth defects, miscarriage, still-births, sterility in men, liver and bone damage to the nervous system, asthma and allergies.

EXPECTATIONS

I expect more active roles by the statutory monitoring agencies in the enhancement of improved street-foods delivery services so far as the public health is concerned. We can expect good quality products if the cooking utensils, the serving plates, cups, wrappers etc are given the appropriate and adequate cleaning. If the raw materials have not deteriorated. If non-food additives especially the colouring agents are not added to the preparation.

Another dimension in the improvement of the safety of street goods as well as strengthening the socio-economic position of our women mostly in the street foods trade is to introduce supportive programmes.

The first programme should include the provision of credits to vendors to acquire the appropriate vending facilities.

The second programme should include extension services on good basic food handling practices and on the preparation of specific street foods.

CONCLUSION

Finally, I wish to state that there is no need for us to panic and abandon the use of street-foods but then it is worth knowing that there is this debate going on about the potential risks associated with these rather important source of meals for me and others alike.

Thank you.

Discussion

In contributing to the presentation Dr. R. Myhara of NRI was of the opinion that subsidies must be made given to vendors to defray some of their costs.

Mr. P. Obeng-Asiedu of Legon, expressed concern on how consumers could form an association to protect their interest. To this Mrs. Marian Adum-Atta suggested that satellite food vending spots where consumers can identify themselves with a particular eating spots and form association of consumers.

Mr. Laryea suggested that NGO's Religious Organisations etc should be involved in the creation of consumer awareness

4.12 AMA bye – laws and policies on street-food vending in Accra S. Fenteng, Accra Metro Solicitor, Accra Metropolitan Assembly

4.12.1 INTRODUCTION

Street vended foods have a long tradition in most countries of the world and Ghana is no exception. Street-vended foods provide ready-to-eat meals that are accessible and affordable for even the poorest in most societies.

4.12.2 REGULATORY CONTROL OF FOOD VENDING IN ACCRA

Important as street-vended foods are in Accra as in many communities, they are also recognized as a potential health hazard.

Through the various stages of AMA's long history as a Town, District, Municipal, City Council and now Metropolitan Assembly it has always been part of its (AMA) functions to promote and safeguard public health. Laws and regulations for this purpose therefore have been in existence for as long as the establishment of the AMA.

Existing Laws

Laws governing food handing, preparation and vending include the following:

- A. Local Government (Accra Metropolitan Assembly Establishment) Instrument, 1995 - LI 1615.

(i) Paragraph 3(2) of this law (i.e. LI 1615) spells out in the second schedule other functions of the AMA without prejudice to the functions conferred on it (AMA) by the Local Government Act, 1993 (Act 462).

(ii) The duties of AMA for the promotion of public health are set out in 1 to 13 of the 2nd schedule of this law: (LI 1615) and for this purpose the Ministry of Health is enjoined to assign Medical Officers of Health, health inspectors and other staff as appropriate except semi-skilled and, unskilled labourers to the AMA for the proper discharge of these duties.

(iii) AMA is to cause the Metropolis to be inspected regularly for the detection of nuisances or any condition likely to be offensive or injurious to health and to take proper steps to abate such nuisances or remove the condition-functions 2 and 3 under the 2nd schedule to LI 1615.

(iv) To ensure the provision of adequate and wholesome supply of water throughout the Metropolis (in consultation with Ghana water company); to establish, install, build, maintain and control public latrines, lavatories, urinals and was places, to carry out services for the removal and destruction of all refuse, filth and carcasses of dead animal from any public or private places; and to provide for the inspection of all meat, fish, vegetables and all other food-stuffs and liquid of whatever kind or nature intended for human consumption whether exposed for sale or not and to supervise and control the manufacture of food-stuffs and liquids of whatever kind or nature intended for human consumption. Functions 4, 5, 8, 9 & 10 of LI 1615.

- B. The Accra Tema City Council (Control of prepared food-stuffs) Bye-laws, 1972.
- C. Accra-Tema City Council (Control of Bakeries and sale of bread)
- D. Accra-Tema City Council (Control of Hotels, Restaurants and Eating-houses) Bye-Laws 1974.
- E. The Accra District Council (Sale of Meat and Fish) Bye-laws, 1975.
- F. The Accra District Council (Control of Treatment and Sale of Milk) Bye-Law, 1976.
- G. Accra District Council (Control of Dried Food-stuffs) Bye-laws 1976
- H. Accra City Council (Sale of Iced water and aerated water) Bye-laws, 1976.

- I. Accra City Council (Control of Food Wrappers) Byel-Laws 1976
- J. AMA (Hawker's Permit) Bye-Laws, 1995
- K. AMA (Public Markets) Bye-Laws, 1995.
- L. AMA (Control of Mills) Bye-Laws, 1995
- M. AMA (Sale of Palm Wine and Can or Beer & Akpeteshie) Bye-Laws, 1995
- N. AMA (Growing and Sale of Crops) Bye-Laws, 1995.

COMMON FEATURES OF LAWS REGULATING FOOD VENDING

Permit and Licences

- (I) The laws require all persons dealing in all kinds of food in whatever form to obtain Development and Building permits from AMA for their site and or structure for their operation. This aspect of the law takes care of structure specification/dimension, suitability and adequacy of the site and structure for the purpose.
- (ii) No person shall operate any business within AMA's area of jurisdiction without a licence issued by AMA (Business Operation Permit). Bye-laws, 1995. For purposes of the topic under reference that should be persons who process, sell, expose or offer for sale of any food.
 - A. The license shall be issued on the recommendation of the Medical Officer of health after an inspection by Health Inspectors.
 - B. The license states the number, the person to whom it is issued, the premises or location, the duration and the date issued.
 - C. Licence must be displayed at the place of sale.
 - D. All licences are subject to renewal every year ie. From January 1st to December, 31st.

Inspection, Approval and or Certification by the Medical Officer. E.g. Under the Accra District Council (Sale of Meat and Fish Bye-Laws 1975) only fresh meat approved by the Medical officers of Health shall be sold.

In fact under this law (sec. 4) no person shall sell or otherwise dispose of any fresh meat at any shop, market or other place or distribute for sale any fresh meat unless it is the flesh of animals slaughtered in the Accra Slaughter-house (now Accra Abattoir) or other approved place.

NB: Provided that Meat that has been inspected, duly stamped to certify it is healthy from outside Accra or Ghana may be allowed for sale on the approval and certification by the Assembly's Medical Officer of Health confirming its fitness for human consumption.

Protection against flies, dust, contamination, etc. All the laws enjoin all food handlers and manufacturers to protect it against any form of contamination.

- A. To this effect foods are to be stored in containers approved by the Councils Medical Officer.
- B. No person shall expose for any sale, any food unless the items are placed on a table or on a support raised at least one or one and a half metres from the ground.
- C. It should be away from sources of contaminants e.g. Solid and liquid wates, pets and pests etc.

References sections 9 & 10 of AMA Hawker's Permit Bye-laws

References sections 11 & 12 of AMA Market Bye-laws 1995

References sections 5 & 6 of AMA Sale of meat & fish Bye-Laws 1975

Health Certificate

- A. Food and Beverages handlers must have valid health certificate issued by a recognized health institution.
- B. Prohibited/Infected Persons
No person suffering from an infectious or contagious disease shall be allowed to handle or take part in the preparation of food or allowed to handle fresh meat or fish or be present in the place of sale or storage.
- C. Health certificates must be within easy reach on the premises for ease of inspection by the Councils Health Officers.

Health Education

Food handlers are advised and encouraged to observe personal hygiene and safe handling and preparation of food. They are also to refrain from unhygienic and unsightly practices. E.g. Spitting, touching the mouth, tongue, eyes, nose, chewing or smoking, sneezing and coughing on or near food.

Protective/Special Clothing

Butchers and their assistants, when engaged in carrying, handling or selling meat, shall wear clean clothing of a style approved by the sanitary officer of the council who shall act on the advice of Medical Officer of Health concern in respect of such style of clothing. eg. overall aprons, etc.

ENFORCEMENT OF THE LAWS

Enforcement of the laws regulating food treatment and or handling in general and street-food vending in particular is primarily the task of AMA Public Health Department.

In enforcing the laws we are mindful of the importance of street vended foods in the daily lives of the urban population.

The AMA have tried not to over-regulate them so as not to eliminate this vital sector. This is not to say that the health of the public must be sacrificed on the alter

of convenience. So apart from prosecuting offenders who contravene the laws, it has always been our policy to organize food handlers into groups or through their own associations based on the type of food and the nature of their operations for purpose of educating them on the requirements applicable to them. On the spot health education is given by health inspectors during their monitoring exercises.

4.1 Enforcement against hawkers in all sectors not only in the food vending industry poses a great challenge to the AMA. With the near "population explosion" in Accra quite a sizeable number have resorted to food vending on our streets and other public places.

Being in motion all the time it is difficult to monitor the activities of the large number of hawkers to know if the requirements under which they are to operate are being observed. We are hopeful however that with continuous public education most of the hawkers in street-food vending would conform.

EFFECTIVENESS OF THE LAWS

With the exception of laws which were made and or revised in 1995 to present the fines or penalties under the existing laws are low and therefore do not serve as deterrent enough to members of the public who may be inclined to contravene them.

Hopefully AMA would revise these laws and enact new ones sometime soon to reflect current trends.

CONCLUSION

It is the prayer of AMA that all stakeholders would support us to effectively regulate, monitor and supervise the activities of street-food vendors and ensure public health.

Discussion

Mr. K. Van-Ess pointed out that AMA has churned out a good number of Legislative Instruments on street-food vending. He however wanted to know the constraints AMA faces in enforcing the bye-laws. Ms Fenteng mentioned that a combination of factors

including lack of personnel, unavailability of utilities and uncooperative attitude of consumers as well as vendors.

On issuing of license to table-top vendors, Mr. P. Obeng-Asiedu asked why AMA does issue them with license. In reacting to this, Ms. Fenteng said the table-top vendors are not stationary and therefore are not easily identified.

To buttress the need for the construction of vending structures, Mr. W. A. Marfo of the Ministry of Local Government pointed out that government policy on sanitation requires the need for AMA to provide standard design and specification for infrastructural development for food vendors.

4.13 GES position on food sold to school Children in Accra. M. Adum-Atta, GES

Metro Education

School feeding has been an area of great concern to the Education authorities from time immemorial because it has been the bane for many a school riots and unrests. Again, teaching and learning do not flourish on empty stomach.

SCHOOL MEALS PROJECT

When GES established the Welfare Unit within its Administrative set up, frequent reports of child-delinquency, poor academic performance, inattentiveness, school drop-outs and other forms of deviant behaviours were brought forth for discussion at Welfare case conferences. These and other reasons compelled the Education authorities to conduct a survey into such cases.

The survey findings revealed that as a result of the economic situation, both parents leave home to pursue trades, businesses and other livelihoods without making adequate feeding and security arrangements for their children.

The pursuit of these ends was not in the best interest of the child, whose parents only dished out a few cedis to him or her to buy food in the streets to eat, some of them ended up spending the money on toffees, iced-lollies and other unwholesome foods, thus affecting their health, growth and academic performance.

The children were also exposed to social insecurity as in their attempt to look for food to buy some of them went outside the school walls and did not come back to school at all. Their involvement in juvenile delinquency was as high as their exposure to road accidents, especially, the schools along highways. A lot of accident cases were reported in Accra, precisely, Independence Avenue schools, area, Abeka Lapaz, Odorkor and Adabraka Farisco area, between the '70s and '80s.

These and various other reasons explain why GES established Meals Project to help solve some of the problems. It was envisaged that if the child could get food to buy in the school at break time, the tendency of going out of the school gates in search of food to buy would be removed, security would be ensured and teaching and learning would not suffer. Again, the food quality, the kitchen environment and the health of the personnel handling and serving the food could easily be ascertained and ensured.

The project took the form of cooking the food in the school for the pupils, teachers and any other person who would be interested to buy. It started in all the 110 districts throughout the country, but they have all fizzled out, except the Accra Metropolitan schools canteens and Tema.

In Accra, 3 pilot school canteens were started in 1975. The schools were Independence Avenue Schools, Mamprobi-Sempe Schools and Anunmle Cluster of Schools. The tally was increased to 14 canteens to cover all the area councils, now sub-Metropolitan areas, between 1978 and 80, with Ayawaso Sub-Metro having 7 canteens out of the 14 school canteens.

Accommodation, Funding and Supervision

GES provided accommodation for the canteen operation. The personnel were also employed and paid by GES. The canteens were supervised by Domestic Bursars and monitored by the Headteachers of the schools (cluster), Home Science Organisers and Inspecting Officers.

The PTAs were mobilized to support the project by way of providing initial equipment like: cooking utensils, pots, plates, bowls and cups, and the monitoring processes.

The then City Council loaned each canteen a token amount of ¢20 to ¢30 per year, for purchasing food items. These monies were reimbursed at the end of each academic year, the monies were loaned.

Food Supply

The bulk of canteens' food supply was from the open market which was expensive. However, Greater Accra CHASS Food Committee supplied them with some bags of rice, sugar and maize at controlled price to supplement; but that was only a gesture of sympathy, because CHASS Food Supply items were bought with the boarding schools fund of second cycle schools into which the basic schools did not have the resources to contribute.

Cost Per Plate

The project was basically meant to give the basic school pupils, at least, one balanced diet a day, so the emphasis was not on profit-making. Canteen Committees were formed within the schools to plan the Menu and also to determine the cost per plate. Foods sold at the school canteens were 20p and 40p a plate with some fruits, between 1976 and 1980, and price climbed up, as it were, with the diminishing image of the cedi.

In 1983, when there was scarcity of food, the school canteens were selling a plate of banku/rice and stew at ¢2, and it is worthy to note, that the schools where canteens were

sited, school attendance was better and encouraging as compared to the others, because their lunch was assured at the time when their homes were empty.

In this case only a marginal profits were generated, which were ploughed back and used as revolving money to sustain the canteens till date, since the City Council withdrew the last loan in November, 1987.

The private food Vendors were also organised and monitored to support school feeding. For effective management and supervision, sheds were constructed in the schools to shelter them.

SHEP Intervention

With the promulgation of SHEP in 1992, it was anticipated that School Meals Project would have a stronger support because the two institutions subsumed to implement the programme, i.e. GES and MOH, have the professional expertise and all the needed competence, to stitch together, to inject appropriate doses into the school feeding project.

Aims and Objectives

On the drawing board, there were a lot of beautifully couched proposals aiming at improving the health, social and general developmental status of the Ghanaian child.

Among other things, SHEP seeks to step-up health education, improve environmental sanitation; stem the upsurge of preventable diseases, ensuring good Nutrition and appropriate snack-food supplement, health services, prevention of road and other accidents; orientation of teachers around health issues to help transmit relevant health messages to the pupils and the community members at large and formation of school health clubs/committees.

This is very important because in our endeavour to enhance teaching and learning, and also to achieve good results of our environmental and other programmes, special emphasis should be placed on education of parents and other members of the community whose attitude, behaviour and practices affect the target group of our programmes.

Fortunately or unfortunately, the two institutions, i.e. GES and MOH, which are to implement SHEP, subsist on Governmental subvention. The needed inputs and support to raise the spectrum of this laudable programme seem to be practically non-existent.

Many a child-centred problems do not seem to have child-centred solutions. Children need to eat well to be healthy enough to learn well. How and what do they eat well to be healthy, is the question. So far, we could not go beyond the 14 school canteens. Even the existing ones are fizzling out into private hands, because of the embargo on employment of non-teaching personnel. The school canteens that had manpower strength of 4 cooks to a canteen have now dwindled to a cook per canteen.

We endeavour to educate, organize and supervise the private food vendors, but to what extent can we control, supervise or direct somebody's business to the advantage of our children, who are always vulnerable to food hazards and nutritional exploitation.

We all want to go to Heaven, but none of us want to die. We need to enjoy good health and our diet is our source of good health. It therefore behoves on all of us to help improve our feeding sources in order to obtain our good health and intellectual capital, to resource our national and international development.

Mr. chairman, Ladies and Gentlemen, our health and for that matter, our salvation and that of our children is placed in the penalty box. How do we play it?

Thank you.

Discussion

Dr. P. N.T. Johnson of FRI asked whether the GES has any control over the numerous street-food vendors found around the schools in Accra. To this she responded in the affirmative. Some of the control measures include regular supervision by school heads and sanitation officers. Mr. Laryea also suggested that a programme should be put in place to educate school children on hygiene and sanitation

OPEN FORUM

In line with the objectives of the project the following were presented for Discussion:

1. To agree on recommendations to improve food safety and quality of street foods by these stakeholders without further research;
2. To identify and agree on areas where new knowledge is required to ensure impact on livelihoods of target beneficiaries. This should include the preparation of a strategy for the development and validation systems for improving the safety and quality of street foods that are technically, economically and socially viable.

SUBJECT: *To agree on recommendations to improve food safety and quality of street foods by these stakeholders without further research*

RECOMMENDATIONS

1. **Well-coordinated education at the Grass-root level on the following:**
 - Hygiene and Sanitation – public education at the markets etc for both vendors and consumers
 - Training of Trainers – Executives of GTCA and AMA Taskforce were identified as possible trainers to be trained
 - Bye – laws governing street-food vending
 - Farmers on the use of agrochemicals
 - School Children on hygiene and sanitation.
2. **Issues regarding Regulatory Framework must be addressed**
 - Enforcement of bye-laws and Issuing of license
 - Problems and constraints associated with enforcement
 - Monitoring of vending activities

- Problems of institutional linkages (AMA, Ghana Water Company, Electricity Company, etc)

3. Dissemination of Information on food handling, food safety, environmental issues etc. through:

- Media (TV, FM Stations, Newspapers) e.g. CSIR-TV Programme-Technology for Livelihood
- Consumers Association of Ghana
- NGO's
- GTCA
- Brochures, leaflets, posters etc

4. Credit facilities and financial assistance to street-food vendors

- EMPRETEC Ghana
- District Assembly Common Fund
- Poverty Alleviation Fund
- Lever brothers Scheme of Incentives

5. Finding Solutions to Infrastructural Problems

- Construction of portable eating places for vending to be designed by CSIR-BRRI and AMA
- Water availability at all vending sites- Wherever food goes water must flow

6. Identification of all stakeholders to help in the implementation of recommendations

- Ministry of Tourism
- Ministry of Health
- Ghana Standards Board
- Ministry of Agriculture
- Ghana Education Service
- Ministry of Local Government

SUBJECT: *To identify and agree on areas where new knowledge is required to ensure impact on livelihoods of target beneficiaries. This should include the preparation of a strategy for the development and validation systems for improving the safety and quality of street foods that are technically, economically and socially viable.*

R&D AREAS

Participants identified the following R&D areas:

1. Research into stored / left over foods especially soap and excess semi-prepared food.
2. Socio-economic implications of stopping the practice of adding lead/cadmium from battery to reduce the melting point of aluminium during the manufacturing of cooking pots.
3. Contribution of vendors' tax to GDP
4. Sources of Pesticides and Heavy metals
5. How to relay information on research findings to street food vendors
6. Management of solid waste, used water etc.
7. Information dissemination to farmers on the proper methods and practice relating to the use of pesticides and other chemicals, moisture control during storage etc.
8. Case-study on the supply chain of raw materials to the final product to identify:
 - where the contaminant occur
 - the extent and ways of reducing the contaminants, and
 - understand the motive of farmers for using agro chemicals
9. Appropriate implementation of HACCP: fish, grass cutter, cow hide (*welle*), etc.
10. Pesticide residues in maize, cowpea, etc.
11. Socio-economic appraisal of improved vending facilities on a case-study basis.
12. Consumer perceptions of street vended foods

PRIORITISATION

In prioritising the above R&D areas identified, participants agreed on the following:

1. Sources of Pesticides and Heavy metals
2. How to relay information on research findings to street food vendors and farmers

3. Appropriate implementation of HACCP: fish, grass cutter, cow hide (*welle*), etc.
4. Socio-economic appraisal of improved vending facilities on a case-study basis and consumer perception on street-food vending

APPENDIX 1 --ACRONYMS

AMA	Accra Metropolitan Assembly
CHASS	Conference of Heads of Assisted Secondary Schools
CSIR	Council for Scientific and Industrial Research
DFID	Department for International Development, UK
FRI	Food Research Institute
GES	Ghana Education Service
GTCA	Ghana Traditional Caterers Association
GTV	Ghana Television, National TV Station
INSS	Industries and Natural Science Sector
KNUST	Kwame Nkrumah University of Science & Technology
MEST	Ministry of Environment, Science and Technology.
MoFA	Ministry of Food and Agriculture
MOH	Ministry of Health
NRI	Natural Resources Institute, UK
PRO	Public Relations Officer
TV3	A Private Television Station, Accra

APPENDIX 2 --LIST OF WORKSHOP PARTICIPANTS

No.	NAME OF PARTICIPANTS	ORGANISATION OR ADDRESS
1	Mrs Christiana T. Mensah	Ghana News Agency
2	Ms Hellen Garblah	Ghanaian Chronicle
3	Charles Tortoe	FRI/CSIR
4	Ms Beatrice Agyemang	TV3
5	Gabriel Borompem	TV3
6	Jonathan	TV3
7	Andy Ntiamoah	TV3
8	Sam Tay	TV3
9	Dr. Margaret Armar - Klemesu	Noguche Memorial Institute for Medical Research, University of Ghana, Legon
10	Dr. W. A. Plahar	Director Food Research Institute, Box M 20 Accra
11	Franklin Bediako	Free Press
12	E. A. Ansong	Ghana Traditional Caterers Association
13	Francis Cofie	Ghanaian Times
14	Charles Okine	Mirror
15	Omema Barnes	Daily Graphic
16	Robert Yawson	Food Research Institute
17	Augustine Andoh	Food Research Institute
18	Mrs Lydia Kwasitsu	Plant Protection & Regulation Services, Ministry of Food & Agriculture, Accra
19	Prof A. Ayensu	Dep. Director-General Council for Scientific and Industrial Research (Industries, Natural Science Sector)
20	Alex Ntiforo	Dep. Director, Ghana Standards Board
21	Nikoi Okoi	Free Press
22	Patricia Setorwu	
23	Ms Sheila Sackey	Radio Universe
24	Dr. A.A. Arde - Acquah	Metro Public Health Dept, Ministry of Health, Accra
25	E. P. D. Barnes	Chief Director, Ministry of Environment, Science & Technology
26	P. T. Damphey	Ministry of Environment, Science & Technology
27	G. K. Yormesor	Ministry of Environment, Science & Technology
28	Kwamina Van-Ess	Food & Drug Board
29	Mrs Marian Adum - Atta	Metro Education Officer, Ghana Education Service Accra
30	Samuel Ofosu Owusu	FRI
31	Charlotte Oduro - Yeboah	Food Research Institute
32	Reuben Tetteh	FRI
33	Samuel Osarfo	FRI
34	W. A. Marfo	Chief Environmental Sanitation Officer, Ministry of Local Govt, Box M 50 Accra
35	D. K. Asiedu	Food Research Institute

36	Mrs Wilhemina Quaye	Food Research Institute
37	Mrs Kafui Kpodo	Food Research Institute
38	Marvel Tarr	GBC/Radio News
39	J. A. Laryea	M.P.H.D. – A.M.A
40	P. Obeng - Asiedu	University of Ghana, Legon
41	Joe Pinto	Choice FM
42	K. Acheampong	Ghana Standards Board, Accra
43	K. I. Tomlins	University of Greenwich, NRI, UK
44	Dr R. Myhara	University of Greenwich, NRI, UK
45	Dr P-N-T Johnson	FRI
46	Prof E. Owusu-Bemoah	Dep. Director-General Council for Scientific and Industrial Research (Agricultural & Fisheries)
47	Ms Selina Fenteng	Solicitor, Accra Metropolitan Assembly
48	E.E. Apraku	Ghana Traditional Caterers Association
49	Mrs Mary Vandyck	Ghana Traditional Caterers Association
50	Salome Agbottah	Ghanaian Times
51	Mawushie Djokey	GTV
52	Mrs Afua Agyeman	GTV
53	Mrs Harieta Nortey	GTV
54	Joseph Sakyi	GTV
55	A.C. Kwami	GTV
56	Lantei	GTV
57	Theodosia Kudadjie	The Hunger Project, Ghana
58	Sandra Fiamanya	Accra Mail
59	John Manful	Food Research Institute
60	David K. Kpanja	Waste Management Dept, Accra Metropolitan Assembly
61	Mrs Agnes Osei-Yaw	Food Research Institute
62	Miss Emma Suodgass	Ghanaian Chronicle
63	Miss Tuula Tornonen	Ghanaian Chronicle
64	Mallarine Narh	Ghanaian Voice
65	Mrs Linda Asante -Adjei	Ghana News Agency

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