

# SECTION 1

## PRESENTATIONS

Food Safety issues – Ghana

Food Safety issues - India

Crop Protection issues – Zimbabwe

## OVERVIEW OF FOOD SAFETY ISSUES IN GHANA

J. Laryea<sup>2</sup>,

### Summary

Ghana has been a member of the Codex Alimentarius Commission since 1967. The Commission, which is a joint effort by FAO and WHO to develop Food Standards aims at protecting the health of consumers and ensuring fair practices in the food trade. It also promotes co-ordination of all food standards work under-taken by international agencies, government and non-governmental agencies. Ghana is also a member of the International Organisation for Standards as well as the Africa Regional Standards Organisation. A National Codex Committee, with representatives from several agencies involved in food control activities, has been established. The committee's main function is to advise the Central Government on matters relating to the work of the Codex Alimentarius Commission and its various technical committees.

There are three key areas for potential interventions to promote food quality and safety. These include food legislation, education of the food industry and consumers and infrastructure development. Even though several food control structures have been instituted, food control activities are still in a disintegrated and deplorable state due to the following reasons:

- *Legislative instruments* are rather old and the penalties for default are pitiful and insignificant. This has resulted in virtual non-compliance coupled with inadequate enforcement of the laws.

Ghana Standards, Ministry of Health Board, Veterinary Service Department, Food Research Institute, Plant Protection and Regulatory Services, Environmental Protection Council, Fisheries Department, Ministry of Local Government, and the Food and Drugs Board are all involved in food control activities. A central controlling body or authority that oversees or co-ordinates their activities was recently formed. The newly established Food and Drugs Board is yet to make any meaningful impact on the food industry in Ghana:

- *Consumer and Producer Associations* are in existence, but they are having very little impact on the food safety and quality situation in the country. Apart from the multinational and national industries, the bulk of food processors are small-scale operators, who lack the necessary training and therefore do not understand the technology involved in their operations, let alone the appreciation for quality assurance. As to the consumers' association, it might as well be non-existent since its main objective of championing the cause of the consuming public is not being achieved.

This undesirable state of affairs has resulted in a situation where the majority of producers, processors/manufacturers and other purveyors of food have very little regard for the quality and safety of the food they market and a largely uneducated and indiscriminating consuming public, who purchase and consume food offered for sale regardless of its quality or wholesomeness. Particular areas of concern are the indiscriminate use of agricultural chemicals, poor post harvest handling resulting in deterioration in quality of food. In the case of traditional food processing, inadequate technologies employed and unhygienic handling practices coupled with doubts about the quality of the raw materials used and possible adulteration, are matters of great concern.

The conditions under which fresh meat and fish are prepared, distributed and sold to the public leave much to be desired. The whole of the Accra metropolis, for instance, was previously served by one slaughterhouse, which was plagued by lack of appropriate facilities that did not affect the proper post-mortem handling of meat. This was demolished in December 1999, resulting in the city

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having no slaughterhouse. Meat and fish are usually sold in markets and open places, unguarded from flies, which spread disease and exposed to direct sunlight, making them more susceptible to further deterioration in quality.

Street foods serve the nutritional needs of all categories of workers, especially in the urban area. However, unsanitary environments and the unhygienic manner in which some street foods are prepared and/or sold, coupled with the doubtful quality of foodstuffs that may be used, raise doubts about their safety. The safety and wholesomeness of ready-to-eat foods have been given top priority in any measures proposed to improve food safety.

In the light of the above, the following constraints to the effective functioning of the existing food control system have been identified:

- Lack of an effective central control body that will administer food law.
- Lack of effective coordination of activities among the agencies involved in food control measures.
- Inadequate educational programmes resulting in inadequate knowledge and understanding among the majority of the food industry operators coupled with largely indiscriminating and undemanding consuming public who have very little regard for the safety of the food they purchase.

From the foregoing it is clear that the current food control measures in Ghana are unsatisfactory and have very little impact on the health of consumers.

## DISCUSSION

**Question:** What is the food safety situation at village level, since there is a higher population?

**Answer:** While most of the regulations are more easily and widely implemented at city level, municipal activities have been decentralised to cover outlying communities in villages and rural areas.

**Question:** Most diseases in Ghana are food safety related; yet food safety has low priority compared with other issues of concern, such as sanitation. What role can your organisation play to change these political priorities?

**Answer:** a) What cannot be done through interventions by politicians is being done by the private sector and local authorities. For instance, the private sector is investing in food safety education.

b) Politicians (and Government) do not see the contribution the food vendors are making to the economy, hence the low priority given to the sector.

**Question:** Is the Ghanaian consumer prepared to pay more for safer food?

**Answer:** The bulk of the people who buy street-vended food are in the low-income bracket. Consumers are generally poor and only concerned with filling the stomach.

**Question:** Are there sufficient resources to monitor and analyse food safety issues.

**Answer:** Yes, more so with decentralisation of the Standards Board services.

## Enhancing Food Chain Integrity: Quality Assurance Mechanisms for Air Pollution Impacts on Vegetable Systems in India

Ravi Agarwal<sup>3</sup>

### Background

Food contamination can occur during cropping, as well as during the distribution of food in the marketplace. The sources of the contaminants can be many, either specific or geographically distributed, and dispersed. For example polluting industries adjacent to agricultural fields can deposit heavy metals on vegetable fields, and can contaminate both soil as well as air. The contaminants can be directly deposited on the crops, or be absorbed through soil and water. Similarly, heavy metals may be deposited on the crops while they are being sold in the marketplace through urban air pollution. On the other hand, pesticide misuse can lead to contamination of food during cropping while pesticide run-off can contaminate ground and surface water to loop back into the food chain.

The chain of providing food to the consumer, which starts with it's farming, and encompasses marketing and distribution hence deals with a host of historically unconnected policy and legal areas. These would impact issues relating to ensuring food quality to the ultimate consumer.

Accordingly, the policy areas, which need to be understood, would extend to those relating to industrial siting, urban land use, urban air pollution besides those relating to consumer protection and safety. It then becomes necessary to examine these areas with a specific reference to their sensitiveness to food safety issues. The activities and institutional structures of the various stakeholders, both formal and informal, which play a key role in these areas, also need to be mapped to enable any interventions. Ultimately it is important to understand the mechanisms of information flows and other interconnectivity amongst these stakeholders in order to examine the possibility of ensuring better food quality to the consumer.

There is low awareness at all levels to tackle the problem. In fact the problem is not even widely recognized. Consumer and consumer groups, farmer groups as well as in national state level nutrition programmes, there are few linkages with food safety. The emphasis, if any, is mainly on food adulteration, and not on contamination. Hence the main law, which deals with this, the Prevention of Food Adulteration Act, examines food from mainly the point of view of adulteration at the point of sale and, in the case of processed food, at the point of manufacture. This leaves out a whole range of possible interventions relating to pesticide use and industrial siting near agricultural fields.

### How safe is the food?

In India the problem of food safety is not addressed under one policy umbrella, and in fact not addressed comprehensively at all. Though India is food sufficient with buffer stock of over 30 billion tones of food grain, however studies reflect that the food itself is not necessarily safe. Pesticide and fertilizer use is intrinsic to food production systems here. Over 93 pesticides are produced however health effects of less than 50% of them are known. The pesticide industry producing about 90,000mt annually is the largest in Asia and ranks twelfth in the world. Though pesticide usage is low per hectare, yet indiscriminant usage has made it a major source of water pollution and food contamination. A 1995 study found 55.1% of farm gate vegetables contaminated with pesticides, and almost 10% with contamination levels exceeding those acceptable (Indian Council of Medical Research - ICMR).

Studies of agricultural products, including vegetables, animal feed and milk products, whole milk, branded milk powder, straw and honey, found between 27% and 42.3 % of the samples contaminated with DDT. DDT was also found in 87% of rural food and 82% of urban food diets, with an average of 37% samples with contamination above the mean residue level (MRL) permitted by

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Indian food laws. Thirteen branded wheat flour samples tested were contaminated with DDT, along with other pesticides. Another study found very high levels of DDT and its metabolite in mother's breast milk.

### Cross cutting policy areas

**Consumer welfare.** At the Central Government level, the mechanism to monitor the quality of food in India is distributed over different ministries. The basic mandate is provided through two main legal Acts, passed by the Indian Parliament.

Consumer Protection Act of 1986, which attempts to define the rights of a consumer of goods and services and legal remedies in case of a violation of consumer rights. It also lays down the structure and distribution of Consumer Courts.

Prevention of Food Adulteration Act, 1955, which requires that all food sold, conforms to standards to particular foods laid down under the Act. It also defines a mechanism for administering the Act both at the Central as well as the State level and procedures for sampling food as well as prosecuting offenders. The focus is on adulteration and not contamination.

**Agricultural policy.** The chief focus in agricultural policy, which relates to food safety, is in the area of pesticides. There is no comprehensive "national policy" on pesticides in the country. The Insecticides Act, 1968, serves as the policy document for regulating the manufacture, registration, use, export and import of pesticides in the country. The government agencies dealing with pesticides are functioning on the basis of various regulations provided under the Act. For instance, if any company wants to manufacture a particular pesticide, after getting a registration from the Registration Committee for Pesticides, it needs to get clearance from the Ministry of Industry and Ministry of Chemicals and Petrochemicals to manufacture the pesticide. The Ministry of Industry, according to the industrial policy on each sector of industries will then grant the permission for manufacture.

The Department of Food Processing, under the Ministry of Agriculture, controls processed Food.

Similarly, farmers are encouraged by pesticide marketing and manufacturing companies to increase pesticide usage, even if it means over-application and improper formulations. Occupational health and safety is also risky as farmers often use very basic protective gear. In some places, farmers, realizing the effects of over-use of pesticides, use less on crops meant for personal and home use, as compared to those meant for selling in the market.

**Industrial siting.** Industrial siting needs approval from Central Government only in cities where population exceeds one million. Non-polluting industries, such as the electronic industry in Delhi, can be located within the city, but generally also within 25 km in periphery of urban areas. Certain types of industries, such as hazardous industries are not allowed within urban limits, and only in specified industrial area.

**Urban Land Planning.** India is undergoing a shift from rural to urban population. With an urban population of 217 million in 1991, it has one of the largest urban populations in the world. It is expected that by the year 2010, the Indian urban population will be almost 40% of its total, from 26% as per the 1991 census. Also the rate of urban population growth is projected to reach almost 51% in 2025, or double that of 1990.<sup>4</sup>

With increasing urbanization, industrial growth is now being pushed into what was agricultural land. This is particularly true in new peri-urban areas, circling growing cities. Land use patterns within

<sup>4</sup> World Bank, *India's Environment, Taking Stock of Plans, Programs and Priorities*, January 1996

growing urban clusters, change of agricultural land to urbanized areas, zoning of various industrial and non-industrial areas, and the planning processes involved therein have a direct effect on the environmental quality prevalent locally. For example in the case of air pollution, industry siting, traffic movement and the distance commuters have to travel each day, open burning of garbage, density of residential areas and cooking fuel used, as well as thermal power stations, all have significant impacts.

### ***Environmental Policy***

The first move towards integrating environmental policy into economic planning was the constitution of the National Committee on Environmental Planning and Co-ordination in 1972, an outcome of the Stockholm Conference on the Human Environment in 1972. India was one of the two countries represented by its Head of State, the Prime Minister. Subsequently during the sixth five-year plan of India (1980 - 1985) there was for the first time recognition of the environmental imperatives for sustainable development. The main areas of focus included water, air, environmental impact assessments, research, education, training and awareness.

The Water (Prevention and Control of Pollution) Act of 1974 set the foundation for environmental regulation. It created the Central Pollution Control Board and the State Pollution Control Boards for each of the states and Committees for the Union Territories to implement the Act. Earlier, the only recourse for environmental protection was laws such as the Indian Penal Code, the Criminal Procedure Code and the Civil Procedure Code, besides suits claiming tortuous liability.

The Air (Prevention and Control of Pollution) Act followed in 1981, to control air quality. However as a later section on the Air Act will show, both these Acts, although setting into place the basic mechanisms for environmental management, were quite insufficient.

The Bhopal tragedy of 1984, led to a paradigm shift in environmental legislation through the enactment of the Environmental Protection Act, in 1986, which was more comprehensive and far reaching. It is still the umbrella legislation today, which empowers the Ministry of Environment and Forests to make a variety of rules and enactment under it for the purpose of environmental protection. A variety of rules have been made under it, relating to the management of hazardous wastes, chemicals, bio-medical wastes, etc. including a provision under section 5 which empowers the Ministry to set up separate bodies for environmental regulation and to transfer implementing powers to it. Significantly the Act also gave any citizen the right, under Section 19(b), to file cases in appropriate courts against any polluting industry after giving 60 days notice to the authority concerned.

Subsequently, the judiciary has been playing a pivotal role in protecting the environment in India, through public interest litigation, which followed this provision. The various environmental laws have been interpreted in the context of constitutional 'right to life' and used very forcefully by the various courts, with the Supreme Court of India spearheading the change.

The environmental laws for example deal with minimum national emission standards (MINAS) for air and water emissions, which are based mainly on taking health effects on humans into account. The effect of these emissions is not factored in, and hence there are no precautions about siting industry in agricultural areas, which deals with concerns about food safety.

### **Gaps**

The lack of adequate data is a major factor contributing to the low awareness and the lack of public policy in this area. There are gaps in the following:

- Data on linkages of food and contamination as well as health impacts.
- Integration of food safety with other policies, and programmes.
- Setting of various standards with impacts on food safety as factors.

- Need for better coordination amongst various departments.
- Consumer awareness, information on food safety and health effects
- Labelling.
- Better information at producer level about food safety, pesticide usage and alternative pest control methods.

**On the other hand it is important to put in perspective the Indian capacity to deal with the problem given adequate and well thought out interventions. These include:**

- Existence of credible sophisticated NGOs- environment, consumer rights, and health. There are a number of public interest groups working on areas relating to health, environment and nutrition that could be tied into food safety issues.

**An active and progressive judiciary.** The judiciary is interpreting a Right To Life in broad aspects under Article 21 of the Constitution of India, and could be made aware of its linkages with food quality and safety.

- A network of laboratories, both State run as well in universities and the private Sector. There is a network of Government run laboratories, university-based laboratories as well as some private laboratories, which could provide facilities for testing food.
- The existence of established laws. A basic framework of laws exists which could be expanded to include food safety issues.

An established State programme on health and nutrition with deep outreach. There is an intensive nutrition programme under the Women and Child Development emphasis of the Government of India, which could be tapped into helping disseminate connected food safety messages.

In conclusion there is a need to bring Food Safety into focus through the generation of data, the identification of sources and linkages of food contamination, creation of awareness, dissemination of information to activate stakeholders and to augment the capacity of the existing system to deal with the problem.

## Discussion

**Question:** Could there be more strength in sampling for a particular contaminant in one State than another?

**Answer:** Yes, there is better application of various laws in some States and the nature and magnitude of problems, such as starvation, varies from State to State. Although food contamination covers all States, it is unfair however, to draw holistic conclusions since governance issues depend on the State.

**Question:** DDT was banned more than two decades ago, how is it that breast milk is DDT contaminated?

**Answer:** DDT was not banned for public health use. It is still being used in the National anti-Malaria programme. Of the stocks available, 20-40% is applied for mosquito control, the rest is leaked to agriculture. DDT has recently been found among stocks of agricultural pesticides. In a 1996 survey, decreasing DDT traces were found in breast milk. Furthermore, DDT is a persistent pesticide. Traces could remain in the soil from past use.

**Question:** Which foods are most susceptible to heavy metal contamination?

**Answer:** A whole variety of foods, including vegetables. Samples were taken randomly across all markets and contamination could be through pollution of production land with industrial waste. The industrial belt has expanded into peri-urban areas, which have also become important production areas.

**Question:** You mentioned the Insecticide Act. Does this also apply to herbicides, fungicides and bactericides?

**Answer:** Although called the Insecticide Act, it covers all pesticides.

**Question:** We are all concerned with Lead contamination of breast milk. Lead is a cumulative poison. What is the Government doing about it?

**Answer:** Not much is being done at Government level. More studies are required.

**Question:** Why did you concentrate only on chemical contamination? Is hygiene not also important?

**Answer:** Hygiene issues are important and are covered by a complete Act.

**Question:** Food safety is not given priority by policy makers. Why have you not converted the benefits to monetary forms so that it impacts on politicians?

**Answer:** This is likely to be a difficult task. To date, we have not considered a cost-benefit analysis.

**Question:** You mentioned that food safety is not central. What do you mean by that?

**Answer:** Food safety issues are scattered across many sectors and no single body looks at food safety issues.



## Zimbabwe: AN OVERVIEW OF PESTICIDE USE AND ABUSE IN RELATION TO HUMAN HEALTH AND FOOD SAFETY

Dr. S. Z. Sithole<sup>5</sup>

Pests, erratic rainfall and climatic changes continue to undermine national food security and the desire to realize economic growth and equity. Pests and vectors of diseases constitute one of the major constraints to crop and animal production and national public health. Cultural, biological, biorational, host-plant resistance/tolerance, chemical and integrated approaches are some of the strategies employed to contain crop pests in Zimbabwe. All stakeholders including the public and private sectors and non-governmental organizations need to cooperate in such a manner that the use of pesticides is safe to human health and the environment. The attainment and sustainability of human health delivery system, food safety and clean environment call for a shared responsibility by all Zimbabweans.

Throughout the food web or food production cycle, there is concern about food safety from planting time, production, processing, and marketing up to consumption. It appears there is little respect for food safety for people involved in producing and processing food throughout the production cycle. For producers, processors and consumers worldwide, safety measures are often too little, too late for those who are not organized.

Considerable evidence has accrued over the years indicating that routine use of pesticides can cause pest outbreaks, upset ecology, environmental pollution and harm to the health of people and animals. Routine pesticide use is by itself an abuse of pesticides and is a result of the misconception that use of pesticides can eliminate pests. Often this aggravates the problem by making pests more resistant to pesticides through killing natural enemies in the agro-ecosystem. Increased pesticide use can lead to increased costs of inputs, decline in income with the consequence that uncontrolled pests impact more on crops and public health delivery system.

Adoption of an integrated production and pest management system (IPPM) can reduce chemically based treatments and maximize biologically based interventions. In order to promote a shared responsibility, Zimbabwe follows the FAO Code of Conduct on the Distribution and Use of Pesticides. Zimbabwe is party to international agreements related to the management of hazardous substances. These include the Basel, Rotterdam, Stockholm and Biodiversity Conventions that seek to reduce risks due to chemicals and pesticides to human and animals and the environment.

The development, testing and manufacturing of pesticides occurs in the temperate climates, and this makes such products relatively unsuitable for use under tropical climates. However, attempts are made to mimic tropical climatic conditions during the development and testing of products. Pesticides that belong to the group of persistent organic pollutants (POPs) are a serious risk to public health and the environment. POPs persist for long periods in the environment and often travel long distances away from source because they are not easily biodegradable. They accumulate in living species, becoming more concentrated in fatty tissue and with time move up the food chain. These toxic contaminants are passed on from one generation to another through meat and breast milk. POPS include DDT, BHC, aldrin, dieldrin, chlordane, endrin, heptachlor, mirex and toxaphene.

### Policy

In Africa very few countries have clear-cut policies on the use of pesticides and often a working pesticide registration scheme does not exist. Zimbabwe is currently addressing the issue of clear-cut policies, directives and regulations affecting agribusiness, human health delivery system, food and environmental safety. Clear-cut policies and regulations are essential and are instrumental in reducing pesticide use, risks to environment, human and animal health and other non-target organisms, reliance

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on pesticides in pest and vector management. The role played by various stakeholders like government, local formulators, distributors and users is crucial for effective policing and overcoming potential problems linked to improper handling, storage and use of pesticides.

Zimbabwe is fortunate that pricing factors such as subsidies, which encourage the use of pesticides, are non-existent. Agricultural chemicals are a major input in crop production and therefore sustain Zimbabwe's agricultural productivity. Zimbabwe has phased out some highly toxic pesticides, identified others for phasing out including parathion, captifol and methyl bromide owing to their adverse effects on the environment, human and animal health. Zimbabwe has signed a number of protocols at regional and international trade levels such as Agenda 21 of the United Nations, SADC and Comesa trade protocols.

### **Legislation**

Legislation is an important part of effective pesticide management in Zimbabwe and ensures that unregistered pesticides are not for sale and use. Legislation and its effective enforcement have prevented unwanted products from entering the country and irresponsible use of highly toxic pesticides. Furthermore, legislation ensures that pesticides whose efficacy and toxicity have been thoroughly investigated and proved effective and safe are sold to the farming community and the general public for use. In the light of an outcry for public safety of human, animal and plant health and the environment, importation, distribution, storage and use of pesticides in agriculture are controlled by various Acts and regulations.

These are administered by the Plant Protection Research Institute of the Department of Research and Extension, and the Hazardous Substances and Articles Board on behalf of the Ministers of Lands, Agriculture and Rural Resettlement, and Health and Child Welfare, respectively. The manufacture, distribution, sale and use of pesticides are regulated under the Fertilizers, Farm Feeds and Remedies Act, Chapter 18:12 of Pesticide regulations of 1997 and Hazardous Substances and Articles Act (CAP322). The Food Control Bill of Zimbabwe, 2001, has gone to parliament for deliberation before it is passed into law. The Bill seeks among other things to establish a Food Control Authority of Zimbabwe. The main function of the Food Control Authority of Zimbabwe will be to ensure that food and food products available for sale to the public are safe for consumption. A Board to oversee the activities of the Authority will be created.

### **Registration Process**

The Plant Protection Research Institute implements the Pesticide Registration part of the legislation on behalf of the Minister of Lands, Agriculture and Rural Resettlement. Registration does not relate only to the active ingredient but also the product's formulation. Registration is intended to provide a record of the level of toxicity and efficacy, information essential for remedial action to be taken in the event of an accident. Clearly, the Acts and regulations ensure that the right type of pesticides are imported and used safely in the country. The registration scheme is also largely concerned with hazard and risk assessment in relation to human health and environmental safety. All pesticides for use in the country are required to meet minimum environmental and health safety standards comparable to internationally set standards. This ensures safe and efficient pesticide use in the interest of the:

- user, in relation to efficacy of product and hazards in handling;
- consumer, in relation to possible residues in food;
- general public, in relation to hazards such as drift, contamination in water sources and wildlife;
- vendor, in relation to protection from unsound and unfair claims for competitive products.

The law requires that any pesticide should be registered following prescribed procedures and regulations before use in crop pest management. In addition, a pesticide can only be registered in the country if it is registered for use in the country of origin. The applicant for product registration is

required to generate efficacy data by carrying out field trials for two to three cropping seasons under local conditions. Importation of limited samples is authorized by the pesticide-registering officer in accordance with laid down procedures and regulations. Experimental samples are not for sale. Thus time to registration is three cropping seasons across agro-ecological zones. This ensures that there is consistency in the efficacy of the product as climatic conditions vary from one season to another. This requirement is particularly beneficial to both the owner of the product and the consumers. The consumers are assured of an effective product, the owner will be able to market the product and its behaviour of the product in the environment will be well known.

**Table 1: Classification of pesticides according to Zimbabwean and WHO systems.**

CLASS WHO SYSTEM	CLASS ZIMBABWE COLOURED SYSTEM	HAZARDOUS LEVEL
1a	Purple	Extremely Hazardous
1b	Red	Highly Toxic
11	Amber	Moderately Hazardous
111	Green	Slightly Hazardous

### Alternatives to pesticides

IPPM systems exist along a continuum that ranges from those dominated by treatment oriented practices that are largely dependent on pesticides to those mostly reliant on prevention oriented biological processes. A wide variation in the availability and use of information on pesticides exists in developing countries. An IPPM toolbox includes the following:

- Cultural control – using crop rotation/crop mixtures to increase crop diversity and timing planting dates to avoid pests
- Mechanical and physical controls – pest barriers and insect traps.
- Biological control – direct introduction of enemies of pests (predators, parasites, disease pathogens). Indirect encouragement of already occurring enemies.
- Bioregional methods- deployment of pheromones to traps pests and disrupt mating. Release of sterilized insects to limit reproduction.
- Chemical control- use of less toxic pesticides as a last resort. A growing concern over health risks associated with food products has prompted revision in sanitary and phytosanitary standards in developed countries. Traditional trade barriers in agriculture continue to decline but technical and regulatory barriers are becoming increasingly a subject of debate today.

### International Trade and Crop Protection

The cost of regulatory intervention by any nation with the intent to protect human health can be significant. This is particularly true for developing countries intending to penetrate the developed country markets. It is estimated that the EU regulations on harmonized maximum residue levels

(MRLS) decrease exports from Africa by about 64 percent or US\$ 700 million in contrast to regulations adopted at international standard.

In countries with economies in transition (those with low and medium incomes) the share of exports remained at 13 percent in the 1990s. If SPS measures become increasingly restrictive, market access is limited and Zimbabwe and other developing countries may incur significant export losses. However, many questions still remain unanswered. The question demanding an answer is how to approach the trade off between appropriate levels of risk to humans, animals and environment and the costs of different levels of protection set in standards to international trade. There seems to be little knowledge about the specific impact of harmonized standards that are shared across national boundaries in contrast to various national standards.

The task of measuring the trade effect of SPS standards is complex. The cost of regulatory intervention can be high relative to no intervention. Food exports subject to regulation standards sometimes involve rejection of imports as a result of border inspection. The loss due to rejection is not limited to the value of the product because it includes transportation and the exporter incurs other export costs. Indeed, the compliance requirements of exporters do not impose trivial costs, especially for developing countries like Zimbabwe. It entails upgrading production systems, processing and storage equipment and quality control stations. This has led to a trade policy debate on the effect of regulation costs for exporters compared with possible gains from higher SPS levels in importing countries.

## Discussion

**Question:** Do you have any specific examples of NGOs working on pesticide use in Zimbabwe and do you share information on IPM with them?

**Answer:** Yes, there are strong linkages with NGOs working on pesticide issues. For instance, AffoRest, Fambidzanayi Institute of Permaculture and ICRISAT in Bulawayo have adopted the IPPM concept.

**Question:** Are you aware of any food safety related work funded by DFID with which we could collaborate?

**Answer:** Yes, my apologies to DFID for not acknowledging their contribution earlier on. The Vegetable Pest Management Programme, which falls under the Crop Protection Programme, operates within the Plant Protection Research Institute and has produced many IPM visual aids and literature for smallholder farmers. It should be noted that peri-urban resource poor farmers are significant supplier

**Question:** Do you foresee PPRI playing an increased role in Food Safety?

**Answer:** Yes, it is within our mandate and we are also encouraging registration of low risk pesticides. We are also very concerned about minimum residue limits (MRL) in horticultural commodities for local consumption, and import and export.

**Question:** Is food safety a priority in Zimbabwe government policy and is there a clear-cut co-ordination of food safety issues at national level?

**Answer:** (Question passed to the Director, Government Analyst Services). The Food Standards Advisory Board was put in place some years ago. However, co-ordination of food safety related activities have been quite difficult since this board reports directly to the Minister. In the past two years, with the assistance of FAO, the Food Control Authority Bill has been tabled to Parliament and hopefully it will be enacted.

## SECTION 2

### PRESENTATIONS

- ◆ Projects R7519 and R7528\_Food safety in horticultural markets in Zimbabwe.
- ◆ Project R7530 – Enhancing food chain integrity, quality assurance mechanisms for air pollution impacts on fruit and vegetable systems (in India)
- ◆ Project R7493 – Improving Street Food Vending in Accra: Problems and Prospects Ghana

## FOOD SAFETY IN HORTICULTURAL MARKETS IN ZIMBABWE

Improving quality assurance systems for fresh fruits and vegetables produced by peri-urban resource poor farmer in Zimbabwe (R7528) A Graffham (project leader), N. Nenguwo, R. Mbulawa, J. Cox, B. King, A. Goodland, C. Coote and K. Chakanyuka and

### Project background

This project addresses two main development problems:

- Urban and peri-urban consumers in Zimbabwe face a potential health risk due to the absence of adequate food safety assurance systems in smallholder production and marketing of fresh vegetables.
- The lack of food safety assurance systems is a constraint to smallholder access to horticultural export markets.

This project seeks to identify the extent of food safety risks associated with horticultural production and marketing, to prioritize the food safety constraints, to develop strategies to minimize food safety risks, to improve food safety assurance for consumers and develop market opportunities. These objectives can be summarized as:

- Assessment of production practice used by smallholders in urban and peri-urban locations from a food safety perspective.
- Assessment of consumer awareness of food safety awareness of food safety in high-density low-income housing districts of Harare.
- Baseline study of contamination of vegetables produced in urban and peri-urban areas, and marketed in Harare.

### Market survey

There are various socio-economic considerations to be made regarding food safety and quality assurance at producer, consumer and policy levels. The market structure is intricate involving the producer, the main market (Mbare musika) in the capital, Harare, vendors, hawkers, wholesale companies, middlemen, supermarkets and greengrocers and the various income level consumers. There has been increased local demand for horticultural produce due to rapid urbanization, emergence of urban middle class with more disposable income. Of late, export opportunities have emerged for the smallholder farmers.

### Assessment of pesticide residues and microbial contamination

A total of five peri-urban producing areas within 15-90km from Harare and with year round supply were sampled. Horticultural marketing is the major source of income for 84% of the households sampled in different areas. Gardens are located in vleis or near rivers and in some cases within the homestead. Garden sizes average 0.5 hectares and size is limited by access to water, land, finance and labour. The most important crops by area for local consumption are tomatoes, brassicas and onions while baby corn and mange tout peas are primarily for the export market.

The farmers depend on pesticides quite heavily. The most common pesticide used by 85% of the farmers interviewed is Dimethoate (Rogor). Several incidences of deliberate and unintentional abuse have been reported. Unintentional abuse is usually due to non user friendly labeling, inability to calibrate sprayers, use of cheaper unlabelled chemical sold on the streets, poor spraying techniques and failure to understand or resistance to adhere to prescribed harvest intervals. Market-driven agrochemical abuse was also identified. For instance Dithane M45, which is a fungicide, is sometimes used to enhance leaf colour on leafy vegetables while harvest intervals for tomatoes treated by pesticides are sometimes ignored when prices are high.

Seasonality and market opportunities push crop production out of optimum growing time, thus requiring greater use of pesticides. Most of the farmers use fertilizers although they do not use specific measurements and recommended rates due to high costs and cash constraints. Few farmers have access to manure and in some cases they use it incompletely decomposed. It was observed that the farmers need to be trained on safe vegetable production. Below is a list of the farmers' perceptions of food safety.

- Unaware of danger of possible faecal contamination.
- Aware of risk of use of stream water for irrigation and use of chemical fertilizers.
- Awareness of hazards due to delays in getting produce to market.
- Rinse hands before handling produce.
- Isolated cases of food poisoning reported.
- Contamination at production stage is rare or non-existent; source of contamination is the central market (Mbare).

# Pollution and health problems in horticultural production Harare: The need for improved quality assurance systems (R7519) G. Cadisch<sup>6</sup>(project leader) and E. Baggs<sup>7</sup>, N. Poole, E. Ngorima<sup>8</sup>, W. Chaonwa<sup>9</sup>

## Project background

High inputs of sewage sludge and pesticides to peri-urban horticulture around Harare is contaminating the food chain and deteriorating the production resources base. This poses severe health risks to consumers, although to date only anecdotal evidence of contamination of produce exists. The project sought to elucidate the sources and levels of heavy metal, pesticide residue and pathogenic contamination in the food chain and recommendations made of safe limits and strategies proposed to reduce contamination. The project objectives can be summarized as follows:

- To develop strategies to improve food security of poor households through improved quality of horticultural foods and better access to markets.
- To identify pathways and propose guidelines for an improved food quality production-consumer chain and reduced contamination of the resource base and products thereby improving livelihoods of smallholder horticulture producers and reducing health risks of producers and consumers.
- To enhance access of smallholder producers to markets and increase consumer confidence.

## Consumer research

Informal surveys and focus group discussions were undertaken. Investigations were made on awareness of, and attitudes to safety of horticultural products. A total of 400 consumers were interviewed in shopping centres and markets at Mufakose, Glen View, Epworth, Tafara and Chitungwiza. Diarrhea, abdominal pains and cholera were cited as the most prevalent food related health problems experienced by household members. Possible sources of these health problems were suspected to be unhygienic practices by retailers, lack of precautions by consumers, pesticide abuse, use of excessive fertilizers, stale produce and use of dirty irrigation water. Produce thought to be at higher risk of contamination included tomatoes, fruit and leafy vegetables while street stalls, central markets namely Mbare/Chikwanha, hawkers and permanent markets were cited as high risk outlets. The following lessons were taken from the consumers:

- Perceived risk: There is widespread understanding of basic precautions.
- Within consumers' constraints (budget and convenience)
- The greatest concern is about hygiene related risks during marketing
- Consumers express support for greater public intervention to ensure food safety.

## Food Safety Policy

Food safety is a case for government intervention. Intervention may range from low level/ low cost to high level/high cost. The government may influence food safety at macro level through setting of regional and international standards, although it is appreciated that regulation may not necessarily improve market performance. The private sector may play its role by operating through an improved market coordination, while advocacy can also affect outcomes without having to sway government policy. Local government can play its role by attenuation and /or eradication of contaminant sources, product sampling and trader licensing.

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<sup>7</sup> Presenter -Research Fellow, Imperial College at Wye, Wye, Ashford, Kent. TN 25 5 AH, United Kingdom

<sup>8</sup> Presenter -Lecturer, Soil Science Dpt. , University of Zimbabwe, P.O. Box MP 167, Mt. Pleasant, Harare, Zimbabwe.

<sup>9</sup> Presenter-Extension Specialist, AGRITEX, P.O. Box CY639, Causeway, Harare, Zimbabwe.



## Assessment of contamination

Assessment of contamination by heavy metals, pesticide residues and microbial contaminants was undertaken. Study sites were areas covered by Mukuvisi River within nine current health districts of Harare and three sewerage farms namely Pension, Epworth and Crowborough.

## Environmental effects of waste water use in horticulture.

Wastewater has been used since pre-1980. The main advantage is that disposal and utilization are concurrently achieved. There are however potential risks of pathogens and heavy metals, which are more dangerous because they are non-biodegradable and non-thermo degradable hence they can persist in the topsoil.

## Assessment of contamination

Assessment of microbial contamination was carried out because it is high priority and there is direct scientific evidence of potential hazardous contamination and indirect evidence through consumer health experience and repeat dealing. Of the horticultural produce sampled, tomatoes and leafy vegetables were found to be contaminated by *E.coli*. However, there is need to identify pathways and risk areas such as greater contamination between Mbare and retailer or retailer or direct route producer-retailer. The study will continue through another season to avail results from a wet season, as the current results were drawn from studies conducted during the dry season.

The study had a facet of socioeconomic research that focused on traders and retailers and their perception of food safety and quality as well as the role of trader organizations. The study revealed major actors in product flows, and alternative marketing channels, the need for marketing margin analyses and feedback to stakeholders and beneficiaries.

The following points came up through consumer research:

- Clarify perceptions of quality and safety attributes.
- Choice theory: quantitative analysis of willingness to pay for quality/safety improvements.
- Feedback to stakeholders.
- Another consideration that came up was the need to provide estimates of costs of ill health.

The work is ongoing but the project has made outstanding achievements so far.

## Discussion

**Question:** Are you certain that the copper and zinc you detected are not from pesticides since some pesticides are copper based?

**Answer:** Copper levels were low in the control sites where there is no effluent discharge, so we believe industrial effluents are the source of copper contamination.

**Question:** Are you able to estimate the costs associated with ill health caused by contaminated food?

**Answer:** So far as I am aware, no studies have been conducted in Zimbabwe. (Question passed to the Government Analyst). No, although certain indicators have been used, e.g. incidence of diarrhoea. However, due to HIV/AIDS, we now doubt the reliability of diarrhoea incidence as an indicator.

**Question:** Which indicators did you use to distinguish the source of contamination (whether it was through handling and marketing exposure by vendors or Mukuvisi river water)?

**Answer:** For microbial contamination, we collected soil samples from plots along Mukuvisi River; no water samples were taken directly from the river. Next we will measure contamination from produce grown on the plots and then move to the river water.

**Question:** At which stage in the production chain do you think contamination is occurring?

**Answer:** We cannot really tell at the moment due to the complexity of the market structure. Today we have just presented preliminary findings, the work is ongoing.

**Question:** Production practices influence final quality of the produce. Have you found any correlation between microbial contamination and pesticide residue levels?

**Answer:** No, our research has not yet gone that far.

**Question:** Smallholder farmers are being contracted by big companies to grow produce for export. Don't you think that the high value produce will have more pesticide residues?

**Answer:** The export market dictates the MRL and the producers should adhere to these so that their consignments are not rejected. Export produce is far more likely to have lower pesticide residues. In some cases the exporting company does the pesticide application while the contract farmer handles all other production aspects.

**Question:** How long will it be before the constraints you raised are addressed?

**Answer:** The process has actually begun. Mechanisms for improved safety have been identified. With assistance from the City Council, education and information dissemination will be quickly addressed. A further six months may be required in the work with retailers and consumers. However, we cannot give a time frame for the actual implementation.

**Question:** What kind of farmers are you checking?

**Answer:** Small-scale farmers.

**Question:** Dr Sithole alluded to the fact that small-scale farmers should not use 'red' and 'purple label' chemicals. However, your work has shown that small-scale farmers are using them. What is your reaction to this?

**Answer:** These chemicals are sold almost everywhere. For instance, as soon as a smallholder farmer has sold all his produce at Mbare, he is accosted by pesticide vendors, offering all kinds of pesticides.

**Question:** Where did the Dieldrin (one of the contaminants shown in your presentation) come from?

**Answer:** Very low levels were detected. Dieldrin is very persistent in the environment, so the traces found could be from residual contamination. We cannot, therefore, imply that farmers were using dieldrin to protect their vegetables.

**Enhancing food chain integrity, quality assurance mechanisms for air pollution impacts on fruit and vegetable systems (R7530)** Dr Fiona Marshall<sup>10</sup>(project leader), D. te Lintello, R Agrawal and M Agrawal,

## INTRODUCTION

The livelihoods of inhabitants of urban and peri-urban areas are dependent on access to cheap and safe food of high nutritional quality. It is particularly important to encourage the consumption of highly nutritious fruit and vegetables, but as the income elasticity of demand of these products is high, there is a need to both increase the supply and maximise the nutritional quality of these produce to benefit the poor. The cultivation of vegetables in India is largely carried out by small scale and marginal farmers often with little support to overcome constraints in production and marketing. Air pollution is one of the major, and increasing threats to vegetable yield and quality in these areas as it has direct and indirect effects on health and agriculture. Producers, traders and consumers all suffer the adverse effects of air pollution. The undesirable effects include food contamination, reduced crop nutritional quality, visible injury, reduced earnings/quality of life, reduced agricultural income and reduced agricultural production. The importance of peri urban agriculture can be expressed in the following points:

- Despite lack of official awareness, peri-urban agriculture supports livelihoods (food, income, employment, cooking fuel) and provides a safety net for poor marginal (<1ha) & small farmers (1-2 ha) who form a large majority of total farmers 70-90% of households involved in agriculture, many part-time (earning 25-66% household income).
- Over 80% spinach beet supplied to the city is from Peri-Urban areas. Information channels: largely unaware of formal support systems – very biased informal channels adopted e.g. local pesticide shop.

The project will contribute to the purpose of improving food security of poor households by developing approaches to address threats to the quality of horticultural produce, and by highlighting ways to improve the specific problems faced by the poor in accessing markets and in the availability of horticultural produce. Specific objectives are to assess air pollution effects on vegetable quality and safety, and the implications for poor producers and consumers and urban and peri-urban India and to identify and recommend feasible technical and institutional approaches to improved product quality assurance of selected horticultural foods.

This interdisciplinary project has six collaborating institutions and involves nine research groups in India as shown in the table below:

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<sup>10</sup> *Presenter - Imperial College, Silwood Park, Ascot, SLS7PU*

Table 1

Sector	Topic	Indian project partners
<i>Universities/ research centres</i>	Environmental science	Banaras Hindu University, Botany Department; Jawaharlal N Environmental Sciences Dept.
	Economics, marketing	Agricultural Economics Research Centre, Delhi University; B Economics Dept.
	Geography, agriculture	Delhi University, Geography Dept.
	Policy analysis & dissemination	National Institute of Urban Affairs
<i>Government</i>		Indian Council for Agricultural Research/Indian Agricultural Environmental Sciences Dept. Central Pollution control Boar
<i>NGO's + private sector</i>	Geography, agricultural studies	Society for Environment, Ecology and Development; Society Planning and Environmental Health; RMSI
	Policy analysis & dissemination	Srishti/Toxics Link; Centre for Science and Environment
	PRA	Development Tracks , International Institute for Environment Development (London)

The study seeks to specifically answer the following questions:

- What is the magnitude and extent of heavy metal contamination in vegetables?
- Where does the contamination come from?
- Who is affected?
- What interventions can be made?
- What are the wider implications of the study?

Heavy metal assessments were carried out in Varanasi. The metals investigated were cadmium, zinc, copper and lead and the selected crops were okra, spinach beet and cauliflower. Market researches were also undertaken. Levels of heavy metal contamination measured in palak and okra at 40 retail outlets in Varanasi were considerably higher than permissible limits. The levels of Cadmium were of particular concern. Contamination at the point of sale was shown to be a major contributory factor, suggesting that produce purchased by the poor may be more heavily contaminated.

A review and consultation process has described the legislative framework for food safety, in India, produced a stakeholder map, a contacts database and detailed case studies.

Market studies have begun to elucidate the structure of supply and distribution of selected vegetables (cauliflower, okra, palak) regarding: geographical origin of produce, transport mechanisms to wholesale markets (Azadpur in Delhi, and various markets in Varanasi); means of transport to market; price negotiation methods; value addition during wholesaling; product quality attributes seasonal and quality price variations.

## Discussion

**Question:** Did your study focus on contamination levels prior to harvesting as well as post-harvest? If so, how do the results compare?

**Answer:** Yes! The results indicated lower contamination at production sites and significant contamination between harvests through to marketing.

**Question:** What is the relationship between air pollution and product contamination?

**Answer:** There is a positive correlation between air pollution and dust levels and product contamination.

**Question:** You mentioned that one could reduce contamination through washing the produce after purchase. Is this a satisfactory recommendation against the background that some people might not have access to clean water?

**Answer:** At least this is a feasible recommendation. We stated that the optimum would be three washings, but for some commodities decontamination can be successfully achieved with one or two washings.

**Question:** Have you analysed the water for levels of contamination?

**Answer:** We have analysed the water at the production sites, but not in the markets. The assumption is that Municipal water should not be contaminated.

**Question:** Is there a cumulative build up of contamination?

**Answer:** Yes, with cadmium and lead.

**Question:** Is the contamination problem seasonal?

**Answer:** There is apparently a very clear seasonality in the heavy metal contamination resulting from aerial deposition. Not surprisingly, the hot dry summers are showing the highest values and the rainy season the lowest. This is probably an issue of deposition rather than emissions. In comparing contamination levels at various sites, there are a number of sources of heavy metals in addition to aerial deposition from cars and industries. These include, as Dr Agrawal pointed out, heavy metals in fertilizers and pesticides.

**Question:** Are there diurnal differences in contamination levels of the produce while it is being marketed?

**Answer:** Yes! Produce purchased in the morning is less contaminated than that bought late in the afternoon.

**Question:** Is covering of produce useful in reducing contamination?

**Answer:** Yes! Vendors who protect their produce with cloths have less contamination on their produce. There is less contamination in wholesale marketed than vendor-marketed produce.

## Improving Street Food Vending in Accra: Problems and Prospects (R7493)

Led by K. Tomlins<sup>11</sup>(project leader), P.N.T. Johnson<sup>12</sup> and B Mahara

### Introduction

Street food may be defined as any minimally processed food sold on the street for immediate consumption (FAO, 1989). Over the last two to three decades, there has been a phenomenal increase in the activities of street food vendors into the capital of Ghana, Accra. This is in response to increasing number of working couples and rapid urbanization. This urbanization and the associated social and structural changes have caused an increased demand for street food. Longer travelling times between living and working places is likely to lead to further increases in demand.

Accra currently has a resident population of about 3.5 million and an additional 1.5 million people during daytime. It is unfortunately 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. The easy availability of foods in the streets of Accra has helped workers cope with long periods of absence from home. Thus the street foods contribute significantly to food security and nutrition besides being physically and economically accessible to most people.

It is an activity that also provides employment to many. Unfortunately, the emergence of informal food businesses can cause health problems if the foods are not prepared and handled properly. In Ghana, women predominantly handle the sector. These women balance their roles as income earners, homemakers and mothers. Operating from all strategic locations at all hours of the day and night, they serve customers with spicy foods, colourful beverages at reasonable and affordable prices.

The Food Research Institute of the Council for Scientific and Industrial Research with the Natural Resources Institute of the University of Greenwich undertook a collaborative project titled "Enhancing the food security of the peri-urban poor through improvements to quality, safety and economics of street-vended foods." This was a one-year exploratory project (November 1999 – October 2000) funded by the Department for International Development (DFID) of the UK Government and was a follow on to earlier studies carried out in the past, by other workers, on street foods sold in Accra. This report is an overview of the project objectives, activities, outputs achieved and recommendations. The FAO and the WHO have also shown a lot of interest in the street food situation in Ghana. Ntifofo (2000) gives an account of two earlier studies carried out with the objective of improving the street food section Accra. The first, a FAO sponsored Inter-country Workshop on Street Foods in Africa, was held in Accra, Ghana (27th April - 1st May, 1992) to create awareness of the contribution that street foods can make to the economy of Ghana. The second study known as the SFSIG study (January 1995 – December 1996), conducted a survey on the street food situation in Ghana, with the objective of finding out the general safety status of the street food business in Ghana. The latter study, carried over a period of 24 months, was aimed at determining the major problems that were militating against the production and delivery of safe street foods and make appropriate recommendations for improving the sector.

In all these studies no conscious efforts were made to assess other quality and safety issues connected with the street food, even though there have been occasional media reports of people being poisoned after eating some street foods. The presence of pesticide and heavy metal residues as well as mycotoxins in prepared street foods is potentially possible. The socio-economics of the street food sector in Ghana has also not been investigated. This was what the recent DFID/NRI/FRI project sought to do. The purpose of the project was, therefore, to contribute to strategies for

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improving food security in poor households through increased availability and improved quality food and better access to markets. The general objective was therefore to assess and prioritise the economic and social importance, and safety and quality constraints of street vended food in Accra 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;
- Assessing the food safety risks associated with street foods using the case study products;
- Dissemination of study outcomes to key stakeholders;
- Organising a workshop for key stakeholders.

Achieving these outputs would provide policy makers and regulators with knowledge regarding the contribution of the street food sector to the economy of Accra.

### **Research Activities.**

The key activities are summarized below:

- Select case study products and vendors.
- Identify supply chains for raw materials to the street-vendor.
- Assess 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.
- Analysis and documentation of case studies.
- A workshop to disseminate study outcomes to key stakeholders, policy makers and regulators of street-food vending in Accra.

### **Socio-economic survey**

The socio-economic survey of a sample of 334 vendors and a mini-census indicated that street-vended foods make an important contribution to the economy of Accra. The street foods sector employs over 60,000 people (based on a head count of nearly 15,600 vendors, each employing 3 additional workers/hands) with an estimated annual turnover of over US\$100 million and an annual profit of US \$24 million. These were remarkable findings and comparable to estimates from other cities. Nearly 94 % of the vendors were women, the majority of whom had minimal education. Unfortunately about 75 % of them do not belong to any association. The Ghana Traditional Caterers Association has not been able to rope in a lot of the tabletop street food vendors. As a result most of the vendors do not pay any tax at all.

### **Heavy metals, pesticides and mycotoxins in the street- vended foods**

The project revealed certain disturbing evidence as regards the safety and quality of the case study foods.

- Nearly 40 % of the waakye samples contained the heavy metal lead above the draft Codex recommended maximum limit of 0.2 mg/kg, Lead contamination can result in learning difficulties and behavioural problems in children.
- About 70 % of food samples contained the organophosphorous pesticide chlorpyrifos.
- Low but non-hazardous levels of mycotoxins and the heavy metal, cadmium, were detected in many of the street food samples.

In this study, all the samples analysed were below the limit. While the levels of aflatoxin were below these limits, aflatoxins have been previously detected in fermented maize products such as kenkey and may exceed these levels when grains and nuts are harvested during the wet season, particularly if they are not sufficiently dried.

The best option for ensuring that good quality maize is made available in Accra for use by food vendors will be to use good quality maize. Good quality maize can be made available to the market if good agricultural practice incorporating quality control systems are used. One of such quality system is the Hazard Analysis and Critical Control Points (HACCP).

A general deterioration in the hygienic levels of study food products was found, especially when one compares them with the results obtained from the SFSIG study, sponsored by the FAO and WHO from January 1995 to December 1996. A number of factors contribute to these increasing trends. Key among them is that there are a high proportion of street-food vendors in Accra who operate around areas where they have limited access to clean portable water, good toilet facilities or sometimes at places close by garbage mounts. Additionally, most of the vendors indulge in practices that increase the spread of microbes. The SFSIG study established about 69 % of them handled food with bare hands and that only about 41 % washed hands before and during handling of food.

The prevalence of *E. coli* is disturbing. This is because it is an indication of faecal contamination. This can arise through the use of contaminated water, poor hygiene of the food vendors, through flies or other insects. *E. coli* is pathogenic and is considered most dangerous to children and the elderly.

## STAKEHOLDER WORKSHOP

A workshop to disseminate the findings of the DFID/NR/FRI project was held in Accra, in September, 2001. The main aims of the workshop were to draw recommendations to improve the safety and quality of street foods and to identify areas where new knowledge is required to ensure impact on livelihoods of target beneficiaries so as to feed into a strategy for the development and validation systems for improving the safety and quality of street foods.

## Conclusions

This one-year exploratory project helped to reveal the enormous contribution of the street-food vending sector to the socio-economic development of the country. Unfortunately, the sector is facing a number of challenges. The most tenuous issue being the safety and quality of the food sold on our streets. A number of hypotheses were developed for further research investigation. I am happy to say that a new concept note on an investigation into the sources and extent of heavy metal residues contamination in our street foods have been accepted for funding by the British Government.

Additionally, there is growing interest to solve some of the problems hindering the sector. Apart from the occasional media attention the sector is receiving, another research group in Ghana on food security in West and Central Africa also organised a workshop to draw attention to the problems of the sector.



## Discussion

**Question:** What was the consumer reaction to the media reports you made?

**Answer:** We were fortunate that the story was supportive of our work. It invoked a lot of response from people to whom we explained that the work was exploratory. However, street vendors have not really responded (except two who made a follow-up). If Ghana had a stronger consumer body, maybe we would have noticed a more decisive response.

**Question:** Does the attractiveness of the product outweigh its safety?

**Answer:** Yes! Most of the clients are poor and that is the only decent meal most of them can afford, they have no alternative.

**Question:** Are there distinct consumer groups (of street-vended foods) in Ghana?

**Answer:** Yes! There is one group, which buys street food out of necessity. The other, which comprises working couples, buy street food because they do not want to prepare home-cooked meals after a day at work. The former group ignores food safety.

**Question:** Where does the scrap metal come from, which is used to make pots for preparing street-vended foods?

**Answer:** There is a lot of scrap metal available: from the car manufacturing industry; roofing sheet, etc.

**Question:** How do you identify safer vending points/vendors?

**Answer:** There are numerous vendors, some are close to refuse dumps and dirt roads. One would certainly prefer to buy from a point, which is well located.

**Question:** Don't you feel that you need to lobby for awareness and education on food safety rather than concentrating on identifying the hazards?

**Answer:** The approach should be 'softly, softly'. Identify the hazards first and then approach the policy makers. If you emphasise only the hazards, through awareness campaigns, you will destroy the vendor's livelihoods. In the past, government officials seized the food, but after realising the vendors' contribution to the economy, the government stopped the raids. We also need to remember that science is based on facts.

**Question:** Is leaded fuel still used in Ghana?

**Answer:** Yes!

**Question:** Why is there no pesticide and heavy metal contamination in bread and salad?

**Answer:** These are not prepared in the local pots. We are not sure why there is little pesticide contamination, because the results were drawn from a snapshot survey.

**Question:** Is oil used in the preparation of waakye?

**Answer:** Yes, and the oil could compound the heavy metal contamination.

## GENERAL DISCUSSION: FUTURE DIRECTIONS FOR CPHP

Timothy Donaldson<sup>13</sup> – Chairperson

### Focus areas

- ~ policy issues
- ~ technical research areas
- ~ need for information to fill gaps and meet demand for food safety related issues.

One speaker pointed out that, while it is necessary to go beyond identifying information needs, they could not figure out how to transmit the information to the targeted beneficiaries in order to get positive results after all this research. How do we deal with the information that we have before putting pressure on the Government? Did the Ghana project benefit from the press coverage?

A: It worked in their favour, but we need to remember that things could have gone wrong. The Ghana team did not only talk of the hazards. They gave their study a socio-economic facet to balance things. The Ethical Trade initiative at the Natural Resources Institute have experience in managing information for a range of audiences.

The EU advises on MRL and this has implications on our exports. This has not been pursued in Zimbabwe. Does this fit in the CPHP mandate? EU and WTO are talking about reducing tariff and trade barriers, but is it not ironic that they are creating these non-tariff barriers?

A: Through our ethical trade work, it emerged that it was important to look at MRL. A call for proposals was made for July 2001. The deadline has been extended.

Are there mechanisms to improve local knowledge on MRL? Whose standards are we applying to classify food as safe or not?

At which point should we disseminate our findings? We may need to first involve all stakeholders who can use the information in different ways.

The Programme may need to build a team, which can readily interact with other stakeholders for dissemination. How is it formed so as to judge what's credible and what's not?

Uptake and credibility depend on who you are and whom you work for.

Links are missing to other research work being done. It will be useful to have findings from other areas, e.g. diarrhoea incidence. The costs and benefits of research on food safety need to be known.

Accessibility to information is a significant problem. Health economics data is important for the CPHP to complete the food safety picture. A cost-benefit analysis of food safety has been done in the US.

Food safety is crosscutting. It is systems-based, rather than dealing with narrow focuses. Does CPHP have funding for joint Programme initiatives?

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It is difficult for DFID to cross-fund health and post-harvest projects. Crop protection and post-harvest seem more likely to be jointly funded.

We should collectively recommend to DFID to look into such programmes for combined funding.

We must try to work closely with the Health Department. Currently all our work is donor-funded. How could the Local Authorities and Governments contribute? We need a sustainable system to continue the work initiated through the on-going projects.

None of the projects described today have shown their impacts on the user group. Impact assessments will soon be mandatory for any proposals to get through. Need to differentiate between evaluation and impact.

Questioned whether impact can be assessed within a 3-year project. Assessment of improved health status might be considered.

### Closing Remarks on Day 1

The complexities associated with supplying clean food to consumers have been clearly demonstrated.

- Low-cost processed food is accessible in urban and peri-urban areas, but possibly at a significant cost to public health.
- The distribution system for low-cost food is dominated by small-scale businesses.
- Legislation for food safety is in place, but difficult to implement.
- The release of data on critical areas can result in food scares.

It is entirely appropriate for the CPHP to contribute to addressing food safety issues. We've brought together an impressive body of experience and we need your help to guide us on areas where our support can be best directed. The issues to be addressed are as follows:

- There is clear evidence of government interest from the high level of participation by government representatives at this Workshop. We have been asked to pay attention to the economics of food safety; and to provide assessment of consumers' exposure to risk. These are needed to guide legislation.
- Do we know enough about consumer reaction to safer food? Are consumers willing to pay more for cleaner food? Is it necessarily more expensive? Are there business advantages to be had by providing cleaner food?
- How do we communicate our results? Are food safety scares an inevitable process in progress?

# PLENARY SESSION

DAY TWO

WORKING GROUPS AND GENERAL DISCUSSION

WORKING GROUP REPORTS

GENERAL DISCUSSION

CONCLUSION

## PLENARY SESSIONS

Three working groups were required to deliberate on the following topics and, in addition review the issues raised on Day 1.

- What changes are needed in the work programmes of the approved projects?
- What new areas should we be covering?
- How can we maximise the value of past and ongoing research; and link more effectively with other Programmes?

### Group A

**Presenter: Andrew Graffham**

*Group Members:*

Dr M Agrawal

Kennedy Chakanyuka

Dr Andrew Graffham

William King

Otilia Mlambo

Esther Ngorima

Dr Elliot Zitsanza

Theodora Nyamandi

Angeline Mutungamiri

### *Planned Activities- Zimbabwe*

- Extend the baseline study to 2 years to establish a solid database covering both the dry and wet seasons.
- Include a third (independent) laboratory for quality control checks so that there will be no bias in generating reliable data for policy.
- Establish sources and pathways of contamination.
- Study economics of production and marketing and how systems respond to changes.
- Investigate handling practices in production and marketing and assess how these systems respond to change.
- Investigate how NGOs, the private sector and civic organisations can be effectively involved in carrying forward project findings.
- Ensure feedback to farmers and trader groups in compatible format.

### *Planned Activities - India*

- Ensure feedback to farmers and trader groups in compatible format.
- Include a third (independent) laboratory for quality control checks, so that there will be no bias in generating reliable data for policy.

### *Planned Activities -Ghana*

- Multiple ingredients of street-foods to be analysed before processing, to complement analysis of the finished product.
- Understand storage and processing practices and how these affect contamination.
- Identify sources of scrap metals used to make cooking pots.
- Investigate environmental contamination.
- Identify the priority needs of street-food vendors for improvements.

### *Key Common Issues*

- There is a need to link all research projects and partners in a continuous manner. For instance, through E-mail and Internet discussion groups, workshop discussions and field trips to enhance mutual understanding.

### *Key Future Research Areas*

- Need for hard scientific baseline data on contamination sources and pathways in the production-marketing-consumption chain.
- Develop research mechanisms for quantifying impact of project activities on livelihoods of the poor.
- Need for integration of food safety and environmental health.
- Investigate handling practices in the production, marketing and consumption chain.
- Understand contamination impacts on nutritional parameters, in addition to food safety impacts.
- Involve export industries in sharing experiences of successful food safety interventions.

### *Non Research Activities - CPHP*

- Need to facilitate infrastructure improvements and access funds.
- Disseminate reliable data to policy makers to help understanding of key issues.
- Funding specific dissemination materials or activities.

## **Group B**

**Presenter: George Cadisch**

*Group members*

Dr. Ravi Agarwal

Dr. George Cadisch

Tungamirai Rukuni

Dr. Tony Mutukumira

Jonathan Laryea

Preacher Chemhere

Darius Sanyatwe

M Chibanda

### **Key Future Research Areas**

- Joint-funding projects between the CPHP and Crop Protection Programmes for work on pesticides.
- Development of simple, low-cost monitoring techniques to assess contamination at village level.
- Environmental education and research.
- Prove if organic produce is safer.
- Prove if use of urban waste for agricultural production is safe.
- Perform cost-benefit analyses for specific interventions for food safety.
- Develop methodologies for effective policy influence at all levels.
- Develop mechanisms to improve ownership of small-scale farming communities in research.

### **Non –Research CPHP Involvement**

- Exchange information with health professionals to determine the interface with health impact assessments.
- Provide support for cross cutting food safety campaign platforms.
- Create cross-programme database for all projects, people and institutional links.
- Develop complementary strategies between projects e.g. models for policy influence.
- There should be a systematic review of linkages with other aid agencies.

The group gave comments on the country presentations.

### **ZIMBABWE**

- Case studies should be done with producers and investigate interactions in the food chain.
- Investigate air deposition of heavy metals and link with the Indian project.
- Investigate other aspects affecting horticultural produce, e.g. nitrate content.
- Attach cost of safety improvement.
- Investigate avenues of interventions at consumer level, e.g. washing to decontaminate produce.
- Give more consideration to specific stakeholder interactions. It is more effective to target specific stakeholders for specific problems than holding 'blanket' plenary sessions.

### **GHANA**

- Consider including air pollution in food safety research, e.g. street lead pollution.

### **INDIA**

- Consider heavy metal contamination of soil and irrigation water.
- Quantify effects and cost of improved handling practices at market.
- Share experiences with other CPHP food safety groups who have not included air pollution in their projects.

### **General Discussion**

After the presentations, the discussion was opened up and the following points were made.

- There is more to food safety than initially anticipated. For instance there is very little background information on food markets. More baseline data should be generated, e.g. the identification of sources of scrap material used to make street-food cooking pots in Ghana.
- Dissemination must be given higher priority.
- There is need to explore possibilities of DFID Programme interactions.
- There is a need to generate data that impacts more readily on politicians.
- Impact assessments should be given more attention.



## **Group C**

**Presenter: Mr Ngoni Nenguwo**

*Group members*

Dr Fiona Marshall

Dr Isaiah Mharapara

Langton Mukwereza

Farai Zimudzi

Dr Nigel Poole

### **Ideas For New Research**

- Research should focus on critical hazard points in the food chain, e.g. cooking pots and organic manure.
- Research should include markets and trader practices.
- Consumer research - is the consumer willing to pay for the safer product?
- Research should also be done on crosscutting areas, so that no gaps are left unanswered on issues relating to food safety right through the food chain, and that full use is made of existing data from the Health and Environmental Health sectors.
- Action research among coalitions of stakeholders to implement recommendations on food safety.
- Mechanisms should be put in place so that maximum stakeholder participation is achieved.
- Assessment of systematic abuse of agro-chemicals.
- Socio-economic factors should be given consideration. For instance, it will be worthwhile to investigate factors underlying pesticide abuse.
- Consider the nutritional implications before giving recommendations to consumers.

### **Maximising Value of Past and Ongoing Research**

- Inter-project co-ordination valuable.
- There should be support for regional exchanges. For example, the trends in Zimbabwean urban centres are shifting towards increased street-food vending. Zimbabwe will benefit from exchanges with Ghana on the subject. Exchange can be achieved through physical exchanges e.g. workshops or through electronic discussion groups, e.g. Internet discussion groups.
- Need to maintain more fluid contact with new and existing stakeholders, e.g. quarterly meetings for the local steering committees.
- Advocacy is a very important non-traditional area for research.

### **Uptake and Dissemination**

- Good results are coming out of the research work but dissemination of these findings is poor.
- Dissemination mechanisms should be explored.

## Annex 1 Programme

### Day 1

0800	Arrival/Registration Session 1: Issues (Chairperson: Dr T Rukuni)
0845	Official Opening
0900	Keynote Address (Mr T Donaldson: Programme Manager)
0915	Presentation 1: Food safety issues: Ghana (Mr J Laryea, Accra Metropolitan Assembly, Ghana)
0945	Presentation 2: Food safety issues: India (Mr R Agarwal, Srishti-NGO, India)
1015	Tea/Coffee
1045	Presentation 3: Crop protection issues: Zimbabwe (Dr S Sithole, PPRI, Zimbabwe)
	Session 2: CPHP contribution (Chairperson: Dr A Masuka)
1115	Presentation 4: Projects R7519 and R7528 (Zimbabwe) (Project representatives: Mr W. Chaonwa; Mrs Esther Ngorima University of, Zimbabwe.)
1230	Lunch
1400	Presentation 5: Project R7530 (India) (Dr F Marshall, Imperial College, UK)
1445	Presentation 6: Project R7493 (Ghana) (Dr P-N Johnson, FRI, Ghana)
1530	Tea/Coffee
1600	General discussion: Future directions for CPHP?
1645	Closing remarks: Introduction to Day 2
1700	End of Plenary sessions

### Day 2

0800	Brief introduction to the day's aims. Allocation to working groups
0815	Working groups get together. Groups nominate a rapporteur and prepare a short presentation to be given after lunch. Questions to be considered by all groups: a) Consider the planned activities put forward yesterday by the four projects and comment on them. b) What research areas should CPHP prioritise between now and 2005? c) Are there any non-research activities that CPHP could support to maximise the value of past and ongoing research?
1200	Lunch Session 4: Recommendations to CPHP
1300	Group presentations Questions/Discussion
1430	Closing Remarks: Programme Manager
1500	End

## Annex 2

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