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Overview of critical food safety problems found in small and medium enterprises of the agro-processing and food service sectors in the Caribbean and possible strategies for finding solutions

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ABSTRACT

Contaminated foods kill millions of people around the world each year. Here in the Caribbean, the exact number of persons who die annually from foodborne illnesses is unknown. SMEs in agro-processing and food service make up a large percentage of the players in the food sector of the region, and their practices are at times questionable.

For these establishments, the critical food safety problems that stymie the food safety effort, include poor personal hygiene, inadequate cleaning and sanitizing practices, inefficient pest control, improper use of preservatives, unsatisfactory time/temperature relationships, inadequate training and inadequate infrastructure.

Possible strategies to assist in solving these problems would involve updating and strengthening of current legislation, improved surveillance and monitoring, training of staff within the SMEs in issues relating to food safety management and production methods and outreach programmes on food safety that target the general public and school children.

Integral to all of this is the sharing of ideas and information and the pooling of data from all of the countries of the region in an effort to accelerate the thrust toward the production of safe food.

INTRODUCTION

The negative impact of ingesting contaminated foods is a perennial problem, affecting millions of people annually. It is estimated that 30 per cent of the population in developed countries may be affected by foodborne diseases each year. Quantitative data for the impact or extent of foodborne diseases in developing countries, including countries of the region is largely unknown.

The Food and Agriculture Organization (FAO) of the United Nations has reported that at least 6000 outbreaks of a number of different foodborne diseases occurred in Latin America and the Caribbean between 1993 and 2002.

There were an estimated 57,000 deaths in Latin America and the Caribbean from food and water borne diarrhoea in 2004. Though these figures are considered to be greatly underestimating the magnitude of the foodborne disease problem in the region.

The changing lifestyles, demographics and consumption patterns of the people of the region have contributed to increasing demand for processed food and fast/convenience foods. The growth in the number of small and medium enterprises of the food manufacturing and food service sectors as well as in the numbers of street vendors, has brought with it increasing concerns about food safety.

The Caribbean Industrial Research Institute (CARIRI) has over the past four years evaluated a number of restaurants, caterers, small and medium food processors and

street vendors to ascertain among other things, the food safety position of these enterprises, with a view to improving food safety practices through direct and indirect intervention.

This paper incorporates the observations on fifteen plus years of experience in the food manufacturing and food service sectors in the Caribbean, in addition to the data generated by CARIRI research.

OBJECTIVES

To determine the problems related to food safety in the SMEs of the food industry in the region and identify possible strategies for solving these problems.

METHODOLOGY

In three (3) major towns in Trinidad, a sample population of 134 restaurants and 56 vendors were randomly selected and food safety audits conducted. In addition, food safety audits were conducted at 12 small and medium food processors and twelve (12) caterers throughout the island on behalf of CARIRI's clients.

Audits were also conducted at 24 select food manufacturers in two islands in the region. Audits were conducted according to the requirements of Good Manufacturing Practices (GMP) and the general requirements of Food Safety Management.

Elements of the audit, that is, areas that were audited included premises (external and internal) design and construction, sanitary facilities, customer eating area, equipment and utensils, cleaning and sanitation, personal hygiene, raw materials, water and ice quality, storage, food preparation/processing, food service, supplier control, product traceability and recall, training and pest control.

During each audit standardized checklists, prepared by CARIRI, were used. Information was also gained through discussions held with managers/owners, supervisors, other employees and vendors. Temperatures of freezers, chillers, cooked food and food being served were taken. In addition, daily operations such as cleaning, sanitizing, food handling and preparation, cooking, serving, packaging, hand washing and hand habits were observed.

Microbiological analyses (total aerobic plate count, total coliform count, faecal coliform, *E. coli*, *Salmonella* and *S. aureus*) were conducted on samples of food randomly selected from audited restaurants, caterers and food vendors. Microbiological analyses were not conducted on processed products from food manufacturers.

RESULTS

The results of the food safety audits indicate that there are similar food safety malpractices in food service and food manufacturing. These practices occur in almost all of the establishments audited. They may be summarized as follows:

Premises. The buildings used by many of the establishments are too small to house all of the operations needed, resulting in cramped facilities and a high risk of cross contamination. There is poor layout of equipment and production flow through facilities contributing to the risk of contamination. In most instances, expert advice was not

sought on facility layout. There are overhead fixtures (fans, beams, pipes, wires, cables) in processing areas and kitchens that have accumulated dust and grease and therefore pose a contamination threat. Most lightbulbs in processing areas and kitchens are unshielded. Floors do not accommodate internal drains and are not sloped to allow proper drainage. There is usually no space allocated for employees to eat their lunch or change and store personal items.

Sanitary Facilities. Bathroom doors are not equipped with self-closing devices. Bathroom taps are not equipped with hands-free devices. Bathrooms are not equipped with hot water.

Equipment and Utensils. Work surfaces are wooden and there is widespread use of wooden chopping boards. There are no hand wash stations in processing areas and kitchens. There is no preventative maintenance programme for equipment. The approach is corrective rather than preventative thus equipment are maintained when they stop functioning. Generally there is no monitoring of (chillers and freezers) temperature and on the few occasions when they are monitored, the thermometers are not calibrated. There is widespread use of wooden pallets. There is no inspection perimeter around equipment. Chiller and freezer temperatures are usually higher than recommended.

Cleaning and Sanitizing. Employees are not properly trained in the use of cleaners and sanitizers, for example, mixing and concentrations, nor are they properly trained in proper cleaning and sanitizing techniques. Cleaning and sanitizing tools (mops, brooms, mop pails, etc.) are usually maintained in an unsanitary condition. In many instances, the same tools are used to clean bathrooms as well as production areas and kitchens. There are no sanitation procedures detailing items and surfaces to be cleaned and sanitized, concentrations of chemicals that must be used, contact items, frequencies etc. The result is that cleaning and sanitizing is usually inadequate is evident by the accumulation of grease and dust under and around equipment.

Personal Hygiene. Visitor's such as sales persons, repairmen and suppliers are allowed to enter processing areas and kitchens without proper attire and without being required to wash their hands prior to entering food sensitive areas. Employees generally do not follow proper hand washing procedures resulting in their hands being inadequately washed. Head coverings usually do not cover and restrain all of the hair. Personal items (handbags, umbrellas, shoes, lunchbags, cellphones) are frequently stored on or under counters, on tables or shelves in the processing area or kitchen.

Raw Materials. Agricultural raw materials are usually not sanitized. There is no formal inspection of raw materials to determine safety, when received. Frozen meats are generally not received solidly frozen nor adequately chilled. Vehicles delivering raw materials are not inspected for compliance with food safety rules, such as cleanliness, absence of non-food items, etc.

Storage. There is usually no inspection perimeter around or under stored goods (raw material, product, packaging). There are usually non-food items (such as cleaners, lubricants and office supplies) stored with food items.

Water and Ice Quality. Microbiological monitoring of water supplies, especially stored water, is seldom conducted. Therefore, the microbiological quality of the water being used, in most instances, is unknown.

Food Preparation/Processing. Cooking and pasteurization temperatures and times are not monitored. Frozen meat and poultry are thawed at room temperature rather than in the refrigerator or under cool or cold running water.

Supplier Control. Operations of local suppliers are not monitored for food safety compliance and the safety of raw materials supplied by foreign suppliers are not ascertained via certificates of analysis or letters of conformance.

Pest Control. Establishments generally do not have formal pest control programmes, even where registered or certified pest control contractors are hired to carry out pest control activities. Usually, untrained employees spray insecticides and apply baits to premises. Many persons are not aware that there are pest control chemicals that are recommended for use in food operations and many of them use unapproved chemicals. Chemicals are often inappropriately applied leading to contamination of surfaces. Material Safety Data Sheets (MSDS) for chemicals are not kept on site in case of accidental ingestion or bodily contact.

Training. Most employees of SMEs in food manufacturing and food service are inadequately trained in issues relating to food safety practices and food safety management.

Food Service. In the case of food service, on countless occasions, cooked food is held at room temperature in the temperature danger zone (5° C to 60° C) in excess of five hours.

There are some specific food safety malpractices relating to food manufacturers that do not relate to food service, for example:

- Many processors of sauces, seasonings and beverages do not pasteurize their products.
- Many processors re-use bottles that are not adequately cleaned and sanitized.
- In many instances preservatives are incorrectly used. Legal limits are surpassed.
- There are several instances of the use of raw eggs by persons processing ponche de crème.
- There is a tendency to accumulate old equipment, discarded packaging material and old construction material in the yards of many of the processing facilities.

Vendors. The main food safety concerns found with respect to vendors are as follows: many handled money and served food simultaneously, food is held for long hours at incorrect temperatures, and there is a general lack of hand washing and sanitary facilities.

Microbiological Analysis. In the three major towns in Trinidad where restaurants and vendors were audited, microbiological results revealed that an average of 80% of the restaurants surveyed served food with levels of microorganisms above acceptable limits. The same is true for an average of 68% of vendors surveyed.

POSSIBLE STRATEGIES

These findings suggest that significant improvement is required in the food safety practices and the management of food safety among the stakeholders audited. One can assume that it is likely that a similar situation exists among the countries of the region.

To adequately address the situation measures need to be undertaken that would assure food safety throughout the food chain. The measures would include: training and education, application of the internationally recognized food safety management systems, upgrade of government facilities including laboratory facilities, upgrading and enforcing current food safety and/or public health legislation, consumer led lobbying, placing of food safety on the political agenda, sharing of information among countries of the region, and the coordinating of activities by existing institutions and agencies.

Training and Education. Too often we find that persons with no prior food safety training decide to open a food establishment because they are of the belief that they can cook and food processing or preparation seems easy, not realizing that, like any other profession, the principles and rules have to be learnt and knowledge acquired, to safely operate in the food industry.

Consequently, training and education are key components if any strategy is to positively impact food safety. The persons producing the fresh agricultural produce on the farm, the employees at the packing house, the delivery driver who takes the product to market or the factory, all factory and restaurant personnel, the wholesaler and retailer, all have to be trained in the safe use of chemicals, measures to avoid temperature abuse, safe handling and storage practices and control of all other food safety hazards.

Application of Food Safety Management Systems. Good Agricultural Practices (GAP), Good Manufacturing Practices (GMP), Hazard Analysis Critical Control Point (HACCP) and ISO 22000:2005 are all systems designed to control food safety hazards to a level that assures the production of safe food. GAPs are defined as all actions relating to the production, processing and transport of food products of agricultural origin that aim to assure the protection of hygiene and human health and the environment, using methods that are ecologically safer, hygienically acceptable and economically viable. Teams responsible for drawing up the GAP guidelines must have the input of all concerned especially the producers who would be implementing the practices on their farms.

GAP programmes must address pest control, use of chemicals, sanitation, physical facilities, water quality, etc.

Safe final products can only be produced with safe raw materials.

The implementation of GMPs must be made a basic requirement of any food operation. GMP are the general practices, for example, cleaning, sanitizing, personal hygiene, etc., aimed at reducing hazards that foods may be exposed to from the stages of raw material, procurement to the production of final product, and are viewed as the foundation of HACCP and ISO 22000:2005.

Even the implementation of GMP, which is considered a most basic requirement in developed countries, has not found widespread use in the food manufacturing and foodservice operations in the region. Many operators are unaware of the requirements.

If the region's SMEs of the food sector wish to export their products, extra regionally and attract the more discerning and free spending tourist to their doors, then increasingly they need to begin thinking about the application of HACCP of ISO 22000:2005

Upgrade of Facilities. There needs to be an upgrade of the facilities of government and other agencies that provide services to the sector. For example laboratories

(Produce Chemist, Food and Drug laboratories) that provide testing facilities for monitoring and certification need to be better equipped and staffed in order to provide a wider range of tests and results in a more timely fashion, so that critical food safety decisions can be made by the operators in the food industry.

Customs Departments, Food Premises Inspection Agencies, Bureaus of Standard and all other agencies governing food production must all do their part to ensure that the consumer is provided with safe food. Inspections must be conducted expeditiously and by trained personnel.

Foodborne disease surveillance needs to be integrated into the monitoring of food safety along the food chains. This is required if information on foodborne disease risks is to be collected and used to mount control and prevention programmes.

Updating and Enforcing of Regulations. Too many of the regulations are outdated and not adequately enforced. Updated regulations need to mandate persons in the industry to at least implement and comply with the requirements of GMP. The issuance of licenses or certification should follow the passing of an annual audit based on the requirements of GMP. Regulations should mandate that all employees be trained in basic food safety requirements as dictated by the appropriate regulatory agency.

The punitive measures and fines for breaking the regulations have to be more severe and there has to be better enforcement of the legislation.

Consumer Led Lobby. The consumer needs to be educated on matters concerning food safety since they are not most strongly affected by its most severe impact – death. Consequently, the consumer should be taught how to judiciously select eating establishments and evaluating the safety of a packaged product. He/she must be encouraged to exercise his/her right not to purchase a product or dine at a particular establishment if food safety violations are observed. Consumers effectively using the strength of their purchasing power to mobilize stakeholders to effect positive food safety changes, can contribute greatly to the improvement of the status quo.

Placing Food Safety on the Political Agenda. Food Safety is not a hot political topic. Generally, only when the media report a major outbreak of foodborne illness, do politicians take note. However, the control of foodborne diseases is a responsibility of government since outbreaks affect businesses, health care providers and the general economy. Governments therefore need to play a more active role in the drive towards improved food safety practices.

CREATION OF THE CARIBBEAN FOOD SAFETY CENTRE (CFSC)

The CFSC, housed at CARIRI, was created in response to the food safety concerns evident in all of the sectors of the food industry in the region.

The center was launched on April 4th 2006 in Trinidad. The objectives of the CFSC are:

1. To educate farmers, food manufacturers, food service providers, food distributors, food regulatory bodies, consumers and school children on good food safety practices.
2. To assist in developing good food safety management practices among food manufacturers, food distributors and food service providers.

3. To foster the implementation of good food safety management practices among food manufacturers, food distributors and food service providers.
4. To influence changes in legislation and infrastructure support for food safety management in the region.
5. To address critical issues in food safety management.
6. To promote coordination among stakeholders in the Food and Beverage Industry.
7. To disseminate information on key food safety issues.
8. To provide technical assistance necessary to ensure good food safety management practices.

In an effort to begin the process of education, the center has initiated the publication of a quarterly food safety newsletter on crucial issues relating to food safety, which it distributes to schools, hotels, health institutions, restaurants, caterers, supermarkets, food manufacturers and government ministries and agencies.

Articles on safe food handling practices, safe storage and transportation of foods, preparation of meals for festive occasions are examples of some of the articles that have been published in the daily newspapers.

A forum has been created on-line (Techno chat) where queries on issues relating to food safety can be posted and responses received.

An online distance learning programme is to be launched shortly where participants can access training modules on food safety; e.g., Cleaning and Sanitation, Food Safety Regulations, Basic Microorganisms in Food, Pest Management, Food Safety Auditing Principles, among others, eventually obtaining certification from the center in the field of food safety.

Training programmes on food safety have been conducted and will be conducted for various segments of the industry; e.g., small and medium manufacturers, food service providers in the school nutrition programme, supermarkets association members and others.

The center has conducted a number of GMP audits and ISO 22000:2005 audits at processing facilities and in some instances implementation has begun.

The status of food safety in the region has to be improved and it is going to take a sustained and committed effort by all of the stakeholders, if we are to achieve the goal of a safe food supply and a healthy regional population.

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