DESCRIPTION OF THE FOOD SAFETY SYSTEM IN HOTELS AND HOW IT COMPARES WITH HACCP STANDARDS.

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Running title- **Food Safety in Jamaican hotels and the HACCP Standards**

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ABSTRACT

Background: Tourism is an important earner of Foreign exchange in Jamaica; hence the protection of the visitors' health is very important. A study of travellers to Jamaica in 1996–1997, found that Traveller's Diarrhoea (TD) affected almost 25% of visitors. The Ministry of Health (Jamaica) initiated a program for the prevention and control of TD aimed at reducing attack rates from 25.0% to 12.0% over a 5-year period, through environmental health and food safety standards of hotels. This paper examines the Food Safety Systems in Jamaican hotels located in a popular resort area, to find out how comparable they are, with the HACCP strategy.

Methods: A cross sectional study was done of Hotels in St. Mary and St. Ann. Quantitative data was obtained from food and beverage/sanitation staff and Qualitative data through in-depth interviews with hotel managers. Observation of the food safety operations was also done.

Results: Majority (75%) of larger hotels used a combination of HACCP and MoH food safety strategies ($p=0.02$), and offered all inclusive services ($r=-0.705$, $p=0.001$). Larger hotels were more likely to have a better quality Team approach, HACCP plan, monitoring of critical control points and more likely to receive higher scores ($p<0.05$). More than two thirds of hotel staff was knowledgeable of HACCP. Significantly smaller hotels (87.5%) received less than 70% in over all score ($r=0.75$, $p=0.01$). Identification of CCPs and Monitoring of CCPs explained 96.6% of the change in the overall HACCP scores ($p=0.001$). Hotel Managers felt that some hotel's system was comparable with HACCP and that larger properties were ready for Mandatory implementation.

Conclusions: While some components of the HACCP system was observed in larger hotels, there were serious shortcomings in its comparison. Mandatory implementation of HACCP, would require sector specific policies be developed for smaller hotels and implemented on a phased basis.

INTRODUCTION

Many environmental and demographic changes in developing regions of the world have resulted in outbreaks of food-borne pathogens and many re-emerging and newly identified food-borne pathogens. These vary from climatic changes, changes in microbial and other ecological systems, poor environmental sanitation and decreasing freshwater supplies resulting in outbreaks of disease such as Gastroenteritis, Hepatitis A and others transmitted by food and/or drinking water. (1)

Mass tourism and huge international trade in food is causing food-borne pathogens to spread transnationally. The Caribbean is one of the most tourism dependent regions in the world, hence the need for healthy and sustainable operating systems to ensure a profitable hospitality industry and tourisms growth. (2)

Several studies have found that diarrhoeal illnesses are affecting travelers. In 1998, Travel Weekly reported that of 63% of persons who experience illness while traveling, 35% classified their symptoms as gastro-intestinal. MacLaurin quoting from Cheung et al (2000) suggests that 17% of 100 UK citizens reported food-borne illnesses while traveling internationally within the last 5 years. She also went on to say that 35% of 290 international air travelers had suffered from food-borne illnesses; quoting from Delgado's (2000) study, she also reported that 38% of a sample of 200 German and UK Vacationers had experienced food-borne illnesses while traveling. (3)

Steffen et al (1996-1997) found that 23.6% of tourists suffered from Travellers' Diarrheoa during their stay in Jamaica. (4) Food and/or water which can be contaminated with enteric pathogens therefore require that host countries make every effort to ensure that hotels and restaurants serving food to the population and the tourism sector, apply safe food-handling and environmental sanitation practices. (5, 6)

The HACCP System

The General Principles of Food Hygiene describes the Hazard Analysis Critical Control Point (HACCP) System as a science based systematic approach which identifies specific hazards and measures for their control to ensure the safety of food.

Initially conceived as a way to provide astronauts with foods of the highest level of quality, HACCP has been adopted by PAHO and the World Health Organization (WHO), the United States Food and Drug Administration, and many other agencies worldwide for the preparation of safe foods at all levels: home, restaurant, and the hotel industry. The HACCP System is based on seven principles,, as follows:

Principle 1: Conduct a hazard analysis.

Principle 2: Determine the Critical Control Points (CCPs).

Principle 3: Establish critical limit(s).

Principle 4: Establish a system to monitor control of the CCP.

Principle 5: Establish the corrective action to be taken when monitoring indicates that a particular CCP is not under control.

Principle 6: Establish procedures for verification to confirm that the HACCP system is working effectively.

Principle 7: Establish documentation concerning all procedures and records appropriate to these principles and their application.

Significant hazards for individual food products are identified after reviewing all the processing steps and scientific information related to the processing of that food. The steps at which these hazards can be controlled (Critical Control Points) are identified, and critical limits, such as processing and cooling temperatures and holding times, are set at key process steps. Monitoring procedures are implemented for each Critical Control Points, to evaluate conformance with these critical limits, and in the event that they fall outside these limits, pre-determined corrective actions are taken to prevent the potentially defective product from entering the market. The HACCP system also relies heavily on verification and documentation to ensure that food safety has not been compromised during any step. HACCP therefore provides a structure for assessing risks or whatever could go wrong, and putting the requisite controls in place to minimize such risks. (7)

Before HACCP can be implemented, pre-requisite programmes such as good hygienic practices, staff training and documented standard operating procedure should be well established. HACCP's effectiveness relies upon the knowledge and skills of both management and staff. (7) Taylor quoting from Holt (1999) pointed out that the most important factor driving the implementation of HACCP is the employment of experienced, technically qualified persons. (8) While flexibility appropriate to the business is important, all seven principles must be applied in the HACCP system. This takes into account the nature and size of the operation, including the human and financial resources, infrastructure, processes, knowledge and practical constraints. The seven principles can be applied in businesses regardless of size and the nature of the operations. (7,9)

The efficacy of the system relies heavily upon the relevant HACCP knowledge and skills, management commitment and understanding of HACCP along with changes in attitude and organizational culture – all requiring adequate training to overcome barriers related to human resources. (9) Failure to adhere to HACCP has been seen to be behaviour-related, however it is more wide spread where there is a lack of policy and legislation to ensure compliance and standardization for the system, as exists in Jamaica and Ireland. (10, 11) There is increasing evidence that whilst HACCP use is widespread in large food operations its use is limited within smaller companies. In the larger food establishments, implementation is mainly motivated by customer demand, market pressure, commitment to self development and sometimes to meet licensing/certification regimes and surveillance programmes (11)

The Jamaican Situation

In Jamaica, Food Safety is a priority programme of the Ministry of Health. Each hotel is expected to identify hazards and establish Critical Control Points (CCPs) for monitoring food safety standards based on a manual of standards and acceptable practices developed by the Ministry of Health and the Tourism Product Development Company Limited to guide the process. (12)

A Food Safety System based on HACCP was implemented in hotels in Jamaica in 1996, however, the extent of its use in this sector is uncertain, and the knowledge, attitude and practices of hotel staff is critical to the further implementation of the system throughout the tourist industry.

The Ministry of Health's Hotel Surveillance system captures information on selected health conditions amongst travellers to Jamaica, which includes data about gastrointestinal symptoms from guests and staff. The data for guests is calculated based on the number of guest nights stayed per week. The inclusion criteria for the hotel surveillance system is that hotels must have 100 or more rooms , serve at least three or more meals on a buffet daily. All inclusive hotels that serve children are also included. Of the thirty three (33) hotels, twelve (12) meet the criteria and are included in the surveillance system. Epidemiological surveillance data from the Ministry of Health reveal a steady decline in traveller's diarrhoea rates since the inception of the HACCP Based programme in 1996 from 23.22% to 4.31% in 2002. For the North East Region area in which the study was concentrated, the rates declined from 23.22% to 5.31% over the period. (13)

This study aimed to describe the Hotel Based Food Safety System among selected hotels and the extent to which it measures up to HACCP Standards, and where necessary to recommend training programmes and the provision of other necessary support for the efficient and effective implementation of Food Safety Systems in hotels and other food establishments.

MATERIAL AND METHODS

A descriptive cross-sectional study design was chosen to measure the current situation since this required using only one group (no controls required). Both quantitative and qualitative data-gathering instruments were utilized. The questionnaires used for the

quantitative data was pretested in three hotels, and minor adjustments made before they were actually administered to the study population. An observation guide was used to evaluate the existing food safety system in relation to key components of the HACCP system (see appendix 3).

Selection of Hotels

The sampling frame consisted of all hotels in a specific geographical section in the tourist resort area. These hotels were stratified into those with 100 or more rooms (10) and those with less than 100 rooms (23) – a total of 33 hotels. Using the stratified random sampling method, a 70% sample of each category of hotel which met the inclusion criteria was studied, which yielded 18 hotels (1 of the 18 selected hotels was closed for refurbishing and another opted out of the study, which resulted in 16 hotels making up the sample).

Selection of Participants

Food safety team members included supervisory and line staff involved in the hotels' Food Safety Monitoring Programme. Staff members were selected based on a convenience method (limited time frame) and included: food and beverage and sanitation staff, hotel nurses, environmental health and safety managers/officers, executive chefs and sous chefs, purchasing/stores staff, house keeping staff and nannies.

Key Informants

These were Hotel Mangers or their designated representatives who were selected for in-depth interviews, to obtain demographic data and background information on the hotels' Food and Safety System.

DATA COLLECTION

Quantitative Methods

A structured questionnaire based on earlier formulated objectives was used to collect data on demographic characteristics, knowledge, attitudes and practices of the hotel workers.

Observational Methods

A Standardized Observation Guide was developed and used to determine the components of Food Safety System that were in place and were in keeping with the HACCP system as well as to identify whether HACCP pre-requisites were in place.

Qualitative Methods

In depth interviews with Key Informants to determine knowledge, attitude and level of commitment to the Food Safety Programme and how they see it in relation to HACCP standards were undertaken. Probing was done to clarify concerns.

Triangulation of demographic data on each hotel, and description of the Food Safety Programme was carried out. This procedure was also applied to obtain the perspective of management personnel as the importance of the programme and how it compares with

HACCP and determine levels of commitment, motivation and challenges to using the system. Analysis was done using the Framework Approach.

RESULTS

Over one third of the hotels assessed did not use a team approach, nor had a documented HACCP Plan/Food safety policy. Larger hotels however, were more likely to have a documented plan and use team approach. The majority of hotels had some means of identifying and monitoring critical control points and more than 70% conducted regular internal audits. Control Points were identified in their food safety protocols or Standard Operating Procedures or otherwise designated, however only a few were clearly marked, or identified by numbers and correlated to actual documentation. In the instances where these were identified, their monitoring was above average in most hotels. This was more evident for Storage (dry and cold), Hot and Cold Holding, and to a lesser extent, Receiving, Preparation and Service, as seen in Table 1). Where records were kept of monitoring CCPs, these were above average and up to date in the majority (75.1%) of cases. Only a quarter of hotels did not do any form of internal audits and over 43.8% kept audit records that were either below average or non existent. Of those who did, 60% did so above average (Table 1).

Verification of food safety practices was done using internal audits, but record keeping was mainly done below average. (Table 1) Overall, one half of the hotels received total

scores less than 70%; the majority (87.5%) of those receiving score less than 70% were in the category of less than 100 rooms (r =0.75, p=0.01).

Table 1: The Degree of Team Approach, Documentation and Monitoring of Critical Control Points in Hotels in St. Ann and St. Mary.

	Level of Implementation of components of HACCP System					
COMPONENTS	**%**	**%**	**%**	**%**	**%**	**%**
Scale	**None**	**Below Average**	**Average**	**Good**	**Very Good**	**Excellent**
TEAM APPROACH	37.5	0	12.5	18.8	0	31.3
Documented Food Safety Protocol/HACCP Plan	31.3	6.3	18.8	18.8	12.5	12.5
Hazard Analysis	31.3	31.3	37.5	0	0	0
Identification of CCPs	0	25.0	12.5	37.5	12.5	12.5
Monitoring of CCPs done	0	25.0	6.3	0	31.3	37.5
Receiving	0	31.3	0	12.5	12.5	43.8
Storage (dry)	0	18.8	6.3	6.3	18.8	50.0
Storage (cold)	0	18.8	6.3	0	12.5	62.5
Preparation	0	18.8	12.5	25.0	18.8	25.0
Actual cooking	0	25.0	12.5	43.8	6.3	12.5
Holding (hot)	0	12.5	12.5	18.8	6.3	50.0
Holding (cold)	0	12.5	12.5	18.8	6.3	50.0
Service	6.3	18.8	6.3	12.5	18.8	37.5
Records Kept	25.0	0	0	6.3	18.8	50.0
Up-to-Date	25.0	0	0	6.3	25.0	43.8
Verification						
Internal Audits	25.0	12.5	12.5	6.3	6.3	37.5
Audit Records Kept/up-to-date	37.5	6.3	0	12.5	6.3	37.5

HACCP = Hazard Analysis Critical Control Point; CCPs = Critical Control Point;

According to Table 2, staff in larger hotels were significantly more knowledgeable about the Meaning and Principles of HACCP and other of food safety procedures ($p<0.05$). The majority of staff in all hotels (81.0% in small and 97.2% in large) said they used written Standard Operating Procedures, however, almost one third of those in smaller properties did not know the meaning of HACCP. Very few persons were able to list the main principles of HACCP without any assistance; however, when prompted approximately half of those in smaller properties and even more in larger properties were able to identify the principles as identification of hazards, monitoring of critical control points monitoring and verification, ($p<0.05$). While the trend was similar for all four principles, it was not significant for monitoring.

Staff in larger hotels were more knowledgeable of the existence of HACCP plans, HACCP principles, use of HACCP self Inspection Checklists, Standard Operating Procedures ($p=0.001$) and methods of prevention of contamination ($p=<0.05$), , as seen in table 3.

The majority of hotels had not done hazard analysis and where this was done it was below average, and significantly more so ($p=0.001$) in smaller properties. (Table 4). The Environmental Health and Safety Committee or HACCP Team as it is called in some properties, is set up to monitor all health, safety and environmental issues that will impact on the hotels operations and verify that the systems in place are working effectively. They also agree that Critical Points in the hotels' operations are identified mainly in the

larger hotels that operate on an all-inclusive basis and are based on the guidelines in the Health and Food Safety Manual for the Tourism Industry produced by the Ministry of Health. They also agree that there is no formal monitoring system in smaller properties.

Key informants identified benefits derived from having a food safety system in place as being: Using the HACCP is seen to have tremendous benefits to the properties as it provides *"leverage for the company and is a huge plus for Jamaica and just about all hotels are embracing HACCP"*. Another benefit is that it is recognized by the Tour and Travel Agencies that send guests to the properties. There was general consensus that the system provided a means of assurance against outbreaks and subsequent legal actions

There was general consensus among key informants that hotel food safety systems was in keeping with the fundamental principles of HACCP. They also agreed that larger hotels were in a greater state of readiness for full implementation of HACCP.

After subjecting the correlations in Table 4 to a multiple linear regression, all variables excepting identification of CCPs and Monitoring of CCPs lost their significance. This model explained 96.6% of the change in the overall HACCP scores as seen in Table 5.

Table 2: Knowledge of the Meaning, Main Principles of HACCP, and Food Safety Procedures in small and large hotels.

Description **% (n)**	**99 or less Rooms**	**100 or more Rooms**	**Significance. (X^2)**
HACCP PLAN	**n=113**		**0.001**
yes	28.6 (12)	76.1 (8)	
no	38.1 (16)	11.3 (8)	

Description **% (n)**	**99 or less Rooms**	**100 or more Rooms**	**Significance. (X^2)**
don't know	33.3 (14)	12.7 (9)	
SOPS	(n=114)		**0.002**
yes	81.0 (34)	97.2 (70)	
no	16.7 (7)	0	
don't know	2.4 (1)	2.8 (2)	
Use HACCP Checklist **% (n)**	(n=114)		0.001
Yes	57.1 (24)	97.2 (70)	
no	33.3 (14)	0	
don't know	9.5 (4)	2.8 (2)	
KNOWLEDGE OF HACCP % (n)			
MEANING OF HACCP	**n=114**		**0.001**
yes	66.7 (28)	93.1 (67)	
no	33.3 (14)	6.9 (5)	
ID HAZARD	**n=114**		**0.014**
mention unaided	7.1 (3)	9.7 (7)	
mention aided	57.1 (24)	77.8 (56)	
no mention	35.7 (15)	12.5 (9)	
ESTAB CCPS	**n=114**		**0.020**
mention unaided	16.7 (7)	15.3 (11)	
mention aided	50.0 (21)	72.2 (52)	
no mention	33.3 (14)	12.5 (9)	
MONITORING			**0.74**
mention unaided	19.0 (8)	20.8 (15)	
mention aided	47.6 (20)	63.9 (46)	
no mention	33.3 (14)	15.3 (11)	
VERIFICATION	**n=114**		**0.021**
mention unaided	7.1 (3)	8.3 (6)	
mention aided	54.8 (23)	76.4 (55)	
no mention	38.1 (16)	15.3 (11)	

HACCP = Hazard Analysis Critical Control Point; CCPs = Critical Control Point; SOP = Standard Operating Procedures

DISCUSSION

Team approach was inconsistent as more than one third of the hotels surveyed did not utilize this for the management of their Food Safety System. Larger hotels were more likely to have a good team approach (p = 0.001; Table 4).

Table 3: Correlation[1] of HACCP Knowledge with Size of hotel[2.]

Comparative variables [3]	***R***	**Significant (*p*)**
Use of HACCP Checklist	-0.495	0.001
Have SOP)	-0.269	0.004
Hotel have HACCP Plan	-0.439	***0.001***
Know meaning of HACCP	-0.342	0.001
HACCP Principles- Identification of Hazards	-0.242	0.010
HACCP Principle-verification	-0.224	0.016
Prevent contamination -time/temperature control	-0.193	0.039
Prevent contamination –cold holding	-0.205	0.029
Prevent contamination –hot holding	-0.205	0.029
Prevent contamination –hand washing	-0.191	0.041
Prevent contamination –cleaning & sanitization	-0.218	0.020

HACCP = Hazard Analysis Critical Control Point; CCPs = Critical Control Point; SOP = Standard Operating Procedures

At the introduction of the Ministry of Health's HACCP based Food Safety System in 1996 (11), there appears to have been some confusion, (based on interviews with key

[1] Only significant correlations are shown. Spearman's Correlation Coefficient used.
[2] Hotel size coded as: 99 or less rooms =1, 100 or more rooms =2
[3] Independent variables coded as -Use of HACCP checklist: 1=yes, 2= no, 3=don't know; Have SOP: 1=yes, 2= no, 3=don't know; Have HACCP Plan: 1=yes, 2= no, 3=don't know; Know Meaning of HACCP: 1=yes, 2= no, 3=don't know; Know HACCP Principle_Hazard Analysis: 1=mention unaided, 2=mention aided, 3=no mention; Know HACCP Principle-establish CCPs : 1=mention unaided, 2=mention aided, 3=no mention ; Know HACCP Principle: Verification : 1=mention unaided, 2=mention aided, 3=no mention; Know HACCP Principle-Monitoring: 1=mention unaided, 2=mention aided, 3=no mention; ***Prevent contam -time/temp control:*** 1=mention unaided, 2=mention aided, 3=no mention; ***Prevent contam –cold holding:*** 1=mention unaided, 2=mention aided, 3=no mention; ***; Prevent contam –hot holding***1=mention unaided, 2=mention aided, 3=no mention***; Prevent contam –hand washing:*** 1=mention unaided, 2=mention aided, 3=no mention***; Prevent contam –cleaning and sanitization:*** 1=mention unaided, 2=mention aided, 3=no mention

informants), between the Health and Food Safety Manual for the Hospitality Industry with a customized HACCP plan.

The fact that larger hotels (> 100 rooms) were more likely to have a documented plan reflects the availability of technical expertise and resources to develop HACCP plans in contrast to smaller and less well developed businesses.

Table 4: Relationship between hotel size, type of food service and components of the hotel food safety system and total HACCP scores

Variable	***R***	**Significance**
# Rooms[4]	0.54	0.001
Type of Food service	-0.705	0.002
Team approach[5]	0.781	0.001
HACCP plan	0.847	0.001
Hazard Analysis	0.842	0.001
Id CCPs[e]	0.879	0.001
Monitoring of CCPs[e]	0.858	0.001
Internal Audits	0.857	0.001

HACCP = Hazard Analysis Critical Control Point; CCPs = Critical Control Point

The majority of hotels (65.5%) had not done hazard analysis or those that did so were below average; this was significantly more so in smaller hotels (p=0.001) (Table 4). This may be related to the fact that only a few had documented plans.

Dependent variable: **Total HACCP Score**

[4]. Pearson's Correlation Coefficient (rho): # rooms coded as continuous variable.

[5]. Spearman's Correlation Coefficient (rho): Food Service: 1=all inclusive, 2= a-la-carte, 3=both; Team approach: 1=below avg, 2=good avg, 3=excellently good; HACCP plan: 1=below avg, 2=good avg, 3=excellently good; Hazard Analysis: 1=below avg, 2=good avg, 3=excellently good; Identification of CCPs: 1=below avg, 2=good avg, 3=excellently good; Monitoring of CCPs: 1=below avg, 2=good avg, 3=excellently good; Internal Audits: 1=below avg, 2=good avg, 3=excellently good;

Hazard analysis was judged on the premise of identification of hazards related to food process steps/activities and not necessarily on raw materials since validation testing, laboratory testing of samples, generic plans and relevant and appropriate predictive models was not available.

Problems with hazard analysis are not unique to theses hotels as over 57% of companies in Ireland (12) had insufficient details in their hazard analysis, 20% of companies had not conducted it at all and 33% did not have any procedures for considering newly emerging hazards. It must be noted that detailed hazard analysis is required for a proper HACCP plan.

The majority of staff were very knowledgeable about the crucial areas identified in food safety protocols and standard operating procedures. This was based on their knowledge of the actual HACCP principles (Tables 2,3). The knowledge of components of the food safety system was also significantly more evident among respondents in the larger hotels. This may be as a result of the structured HACCP based food handlers training and ongoing training done by these larger establishments. Identification and monitoring of Critical Control Points (CCPs) plays an essential role in the hotel's Food Safety System, as evidence by over 70% of hotels doing some form of monitoring, which marks an improvement in the food safety system since the implementation of HACCP based system in 1996. Identification and monitoring of Critical Control Points (CCPs) together contributed 96.6% ($p=0.001$) of the changes in overall scores received by the hotels (Table 5).

Table 5: Stepwise Multiple Linear Regression Analysis of Total HACCP Assessment Scores.

Predictors	**β**± SE	**Significant *t***	$R^{2\ change}$
Identifying CCPs	9.57 ± 1.39	0.001	0.872
Monitoring of CCPs	10.22 ±1.73	0.001	0.094
Total R^2			**0.966**

HACCP = Hazard Analysis Critical Control Point; CCPs = Critical Control Point

The findings of this study are therefore in keeping with those of Ashley, which postulated that re-inspections assessment scores showed an increase in the mean compliance scores for all CCPs over baseline values, reflecting an overall increased compliance to public health standards and represented real improvements in food hygiene standards. These improvements, however were not evenly distributed across all hotels, as is the case in the present study.

Verification procedures were conducted in the form of internal audits. This is not given priority in most hotels and there was concurrence among Key Informants that one of the challenges facing the staff is that they did not fully understand the need for the programme, especially the record-keeping which they often thought burdensome. (Table 1) This finding was similar to what existed in Ireland where 48% of companies did not have a verification schedule and only 21% had a formal verification schedule in place. (12)

Quality Assurance Systems are also considered prerequisite programmes (PRPs) for HACCP. These programmes are driven by policies which provide standards for purchasing/supply of foods, formal surveillance systems – with mandatory reporting of

illnesses and health events on a weekly basis and sampling of potentially hazardous foods for food-borne illness surveillance. Potable water sampling is done routinely to assess bacteriological quality.

Experience has shown that the most successful implementation of HACCP is done within an environment of well-managed PRPs which screen out general hazards thus allowing greater focus on significant hazards. It is highly desirable therefore that hotels in general and those which offer all-inclusive services in particular, be encouraged to develop, document and implement Quality Assurance systems.

Comparison of the System with HACCP

There was general consensus that the Food Safety Systems surveyed were in keeping with the fundamental principles of HACCP even though the "structure" was absent at the smaller properties.

Where all-inclusive services are being offered preparations for the implementation of the HACCP system are well advanced and therefore regulators will encounter less resistance at these properties. While there are similarities between the Food Safety Systems, e.g. the Team Approach, Monitoring of Critical Control Points and Documentation, there were major limitations when compared with HACCP, this was more so with the smaller properties. The implementation of the HACCP system in resource constrained settings has once again been exemplified. Larger hotels are able to provide the pre-requisite programmes needed while smaller hotels are constrained by limited resources, and by

extension the quality of their food safety programme is further reduced. The HACCP based programme initially implemented in 1996, has proven to reduce the incidence of Travellers diarrhoea significantly and is still effective today. This is evidenced by the reduction in traveller's diarrhoea rates from 23.22% to 5.31%. One limitation of this study id that the surveillance system does not capture information from the smaller hotels routinely; hence the author is unable to do a comparison based on size of property. However, it is quite clear from the available data in larger properties that would pose most risk of diarrhoea that the system is effective in preventing and controlling food borne illnesses (13).There is therefore the need for the hotel food safety system in all hotels to be brought up to HACCP standards. This will guarantee greater effectiveness and recognition internationally, as well as to preserve the tourism product.

The pre-requisite programmes at the majority of the larger properties can form the foundation for full implementation of HACCP with some technical assistance and support.

Due to the marked differences between the two types of hotels, there is the need for set policies and guidelines specific to the type of business. Tourism is a major contributor to the country's economy and any effort to improve the quality of service offered by the sector can only be a plus. The Government should actively look at developing sector specific policies to cater for the different levels of hotels and seek to implement the mandatory implementation of HACCP on a phased basis.

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