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An Examination of the Food Safety System in the State of Qatar

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MPH 5802 Research Project

Fall 2008

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1.0 PURPOSE

To examine the food safety system (Appendix 1) in the State of Qatar.

To provide evidence based data to support capacity-building (Appendix 1) initiatives in the food safety retail system in the State of Qatar.

To evaluate the strengths, weaknesses, opportunities, and threats that exists in the retail food safety system in the State of Qatar.

To provide a comparative analysis of the retail food safety system found in the State of Qatar and in Canada.

2.0 INTRODUCTION

Background

Foodborne illness continues to be endemic in our global environment. Protecting the human host from exposure to foodborne pathogens and reducing the incidence of foodborne illness are the central goals of established food safety intervention programs at national levels. Foodborne illness is a significant contributor to morbidity figures and has a major economic impact on global health care systems. For example, foodborne surveillance activities in the United States state that, "foodborne illnesses affect 6 to 80 million persons, cause 9, 000 deaths and cost an estimated 5 billion U.S. dollars annually" (Altekruse, Cohen, Swerdlow, 1997). Moreover, the consequences of foodborne illness in the public food service sector have an impact on foodservice workers, the foodservice industry and the community.

If a business is implicated in a case of foodborne illness it can result in financial loss because of bad publicity and the subsequent loss of business, increased insurance premiums, a loss of consumer trust in the food supply and distrust in public health authorities responsible for the protection of population health. "In Canada, as many as 8.5 million Canadians (approximately 1 in 4 persons) are estimated to develop foodborne illness resulting in the hospitalization of 39 000 people and as many as 600 deaths" (Canadian Restaurant and Foodservices Association, 2003). The resultant burden on the health care system has been estimated at approximately 2 billion dollars annually (Canadian Restaurant and Foodservices Association, 2003). "The majority of enteric disease is mild and requires only a day or two of reduced activities; however, these cases pose a significant burden due to lost of productivity and other related costs. In Ontario, about 1 in 313 cases of enteric disease are reported to the

province through passive disease surveillance” (Majowicz, et al., 2004) suggesting that many cases are overlooked or ignored.

“Recently, a spinach based outbreak of *E. coli* 0157:H7 in the U.S. affected 26 states with 204 confirmed cases, of which there were 104 hospitalizations with 31 of those cases developing debilitating chronic disease associated with hemolytic uremic syndrome and 3 deaths” (Food & Drug Administration, 2006).

Established intervention programs at various government levels adopt evidence-based practices to ensure an adequate supply of safe food for domestic consumers and to meet international standards and laws for food exports. Managing food safety programs to reduce the burden of illness is a complex task, broad in nature and must include a comprehensive program targeted at all stages in the food continuum - a “farm to fork” approach (Davidson, 1989). This approach to food safety addresses a means for food safety control at all levels from the farm where animals are raised, through to the slaughtering and processing, transportation, retail and to consumer end use. This is an approach to address key areas in the food continuum, to identify where food may become contaminated by physical, chemical or microbial hazards and to subsequently establish controls that reduce the risk of such contamination hazards.

The rationale to systematically implement an effective national food safety system is essential to protect the health and safety of domestic consumers while enabling countries to assure the safety and quality of their foods entering international trade. The global environment for food trade places a considerable obligation on both importing and exporting countries to strengthen their food safety systems and implement a risk-based approach for food safety strategies based on modern, evidence-based methods to ensure uniform standards internationally.

Food safety and quality capacity-building activities are generally undertaken in countries upon the request of governments. The ability of a country to carry out the necessary components of a comprehensive “farm to fork” (Davidson, 1989) approach to food safety varies by country. The gaps and needs of selected countries should be identified with an assessment to identify deficiencies. These may include the absence of national food safety plans, outdated laws and regulations, the lack of surveillance data on foodborne disease, poorly resourced inspection directorates and a lack of educational and training materials. Many of the significant steps identified by the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO) address strengthening local technical and scientific capacity and developing effective educational tools and programs.

The activities of capacity-building food safety systems are broad in nature and include advocacy and technical collaboration with ministries of health. They rely on the identification of the building blocks of national food safety systems. Examining the approaches of food safety interventions on a national scale are important to analyze the strengths, weaknesses, opportunities and challenges that exist within the system. Specifically to Qatar, an examination of a national food safety system is a fundamental building block for a future strategy to provide evidence to program planners and law makers at the respective Health Authorities in Qatar: the National Health Authority (Appendix 1) and the Ministry of Municipal Affairs and Agriculture. The State of Qatar is an ideal geographical area to assess for food safety capacity because of its dynamic, rapidly expanding economy, and the development of a primary prevention health care system which is attempting to keep up with the huge population explosion and economic development. Qatar is in the midst of developing its basic public health infrastructure (both preventive and curative models) and it is in need of specific capacity-building directives which

will most importantly provide the evidence or rationale for primary prevention food safety systems to protect the public from the risks associated with foodborne contaminants. Evaluating the food safety system through this current analysis is an attempt to identify the gaps and needs that exist in the food safety system in Qatar as a step to promote positive, organized, systematic change to the food safety systems.

Environmental Scan

An environmental scan of the internal and external environments in the State of Qatar was conducted based on a literature review: The external environmental scan describes some attributes pertaining to the demographics, health indicators, political considerations, Islam and socio-cultural dynamics that influence food safety systems in the State of Qatar. The internal environmental scan will describe the attributes of the public food safety system in the State of Qatar delivered by two ministries which influence food safety systems directly; the National Health Authority and the Ministry of Municipal Affairs and Agriculture.

An environmental scan provides the important background information necessary to identify how food safety intervention programs are delivered at the government level in the State of Qatar. This scan will also provide the supportive information necessary to achieve the purpose of this project in examining the retail food safety system; its capacity to protect public health through government interventions and to comparatively analyze retail food safety systems in the State of Qatar and Canada.

Comprehensive food safety systems at the national level should include strategies to promote and protect public health at all stages of the food continuum, and therefore should seek to identify, assess, and manage foodborne hazards in the population. A Hazard Analysis Critical

Control Point (HACCP) approach to food safety at the federal level occurs in Canada at all stages of the food continuum.

Currently, the State of Qatar implements some of the strategies of a comprehensive food safety system as illustrated in Table 2 s with the exception of on farm food safety. There is currently no program in place to identify and manage food safety risks at the farm level in the State of Qatar. The focus of this paper will primarily examine retail food safety in the State of Qatar.

Table 2.1 Comparison of Selected Attributes of a Food Safety System between Canada and the State of Qatar

Step in the Farm to Fork Approach	Description of Program and its Activities in Canada	Description of Program and its Activities in Qatar
On Farm Food Safety	<p>Food Safe Farm Practices Program- Application and Registration of Business through Food Safe Farm Practices Program</p> <p>Generic Model of HACCP implementation program to describe, identify, evaluate known hazards and to identify critical control points on the farm. Record keeping, verification and inspection audits for compliance by registered auditors of the federal government for compliance with HACCP.</p> <p>(Canadian Federation of Agriculture, 2008)</p>	<p>There is an absence of a Food Safe Farm Practices Program to promote and prevent foodborne disease in the State of Qatar.</p> <p>Vegetable, dairy, beef, poultry, and sheep production in the State of Qatar has no authority or practicing standards to promote and protect food safety on the farm-Veterinary supervision exists only a single producing dairy farm in the State of Qatar.</p> <p>(Dr. Mohammed Ali, personal communication, October 8, 2008)</p>
Slaughtering/ Transportation of Animal to Slaughter	<p>Live Inspection of Animal (Ante mortem and Inspection of Slaughtered Animal (Post mortem by licensed veterinary officers.)- Ante mortem inspection for evidence of any signs the animal has a communicable disease, inspection for demarcations to identify the animals origin for traceability purposes and to determine if the animal is fit for slaughter. Post mortem inspection for evidence of bacteriological contamination, diseased organ systems or antibiotic residues in meat tissue. (Gracey, Collins, Huey, 1999)</p>	<p>Live Inspection of Animal (Ante mortem and Inspection of Slaughtered Animal in accordance with animal slaughtering requirements according to Islamic law in the State of Qatar. Content of Guiding document entitled "General hygiene procedures and technical requirements for handling, preparation and storing meat, poultry and fish. The contents of the procedures cover aspects of organs and visceral removal, hygiene preparation, transportation, handling and storing of fresh meat, hygiene requirements r poultry processing, and Islamic slaughter practices.</p> <p>(Ministry of Municipal Affairs and Agriculture, 1999)</p>
Processing/Packaging	<p>Analysis Critical Control Points/ Food Hazard Safety Enhancement Program- A HACCP based initiative where food businesses become certified and accredited. Implementation of the program involves operators to describe, identify, evaluate known hazards and critical control points during the stages of food processing/ packaging with appropriate record keeping. Recognizing establishments, assessing corrective actions and auditing food processes for compliance with HACCP is a key role of government food safety inspectors working collaboratively with HACCP operators.</p> <p>(Canadian Food Inspection Agency, 2007)</p>	<p>The inspection of food processors is mandated to be carried out by the Municipality of Municipal Affairs and Agriculture solely. Bottled water factories are inspected and enforced by standards set out by the National Health Authority.</p> <p>(Dr. Mohammed Ali, personal communication, October 15, 2008)</p>
Retail Food Safety	<p>The identification of all food related businesses in a jurisdiction which serve, prepare, store, transport food to the public for immediate consumption which may include but not limited to (cafeterias, schools, restaurants, caterers, canteens, mobile food vendors, bakeries, grocery stores).</p> <p>The regular inspection of all food related businesses based on risk assessment HACCP principles categorized as high, medium or small risk. Those food related businesses where the risk of foodborne illness would be considered higher would be subject to increased frequency of inspections and be considered high risk (i.e. a large food business which serves hazardous food to the elderly population). Low risk and medium risk categorized food businesses often serve less hazardous foods, involve less or limited food preparation and often serve food to less susceptible groups of persons in the population.</p> <p>(Ministry of Health and Long Term Care, 1999)</p>	<p>No systematic method to identify, track, inspect and categorize all public food establishments based on risk assessment techniques (high, medium, low risk). Cafeterias, juice stalls, restaurants, food stores are mandated to be inspected by both the National Health Authority and the Ministry of Municipal Affairs and Agriculture as a joint effort. Clarification of roles and responsibilities not clearly defined. Frequency of inspections based on HACCP methods is not well established</p> <p>(Dr. Mohammed Ali, personal communication, October 8, 2008).</p>

The National Health Authority was established as per a ruling of the monarch of the State in 2005 (to replace the former Ministry of Public Health Agency). The authority is a single tier government entity responsible for the delivery of preventive public health programs (i.e. foodborne illness prevention) and health care programs across the State of Qatar. One of the main responsibilities of the authority is the protection of public health by overseeing the control of contagious and communicable diseases in the State of Qatar. The National Health Authority also focuses on adopting programs related to environmental health inclusive of food safety control programs. The National Health Authority includes programs at the ports and borders for the monitoring of imports for foodborne adulterants, toxicants, and microbial risks in coordination with the National Laboratory. In addition, the Environmental Health department of the National Health Authority is responsible for the delivery of a public food inspection system of all retail outlets including juice stalls, cafeterias, caterers, restaurants, and school canteens in the State of Qatar (with a health promotion focus) while the Communicable Disease Department of the National Health Authority is responsible for the foodborne disease surveillance system.

The Ministry of Municipal Affairs and Agriculture (MMAG) is another government entity responsible for the delivery of specific public health programs related to food safety in the State of Qatar. An inspection directorate exists at the main office of the MMAG where food inspection and enforcement activities are conducted under the auspices of ten separate municipalities in the State of Qatar. Their primary role at each municipal office is the inspection and enforcement of Qatari law pertaining to retail establishments inclusive of cafeterias, juice stalls, restaurants, caterers. This is quite similar to the functions of the National Health Authority with respect to inspection initiatives. However, the MMAG is the sole provider of enforcement activities of food safety law in the State of Qatar. Their role is similar to the functions of the

National Health Authority Environmental Health Directorate with respect to inspection activities, a duplication or redundancy of services.

A majority of Qatar's 1 035 000 residents live in either the capital city or in one of the three other major communities, the vast majority 774 034 is over the age of 18 (World Health Organization, 2006). These communities are urban mixes of non-integrated communities and sub-communities based on racial, geopolitical, religious, socio-economic and other demographic determinants. About 15 to 20 % of the total population is considered Qatari nationals, while the remaining 80% to 85 % are temporary expatriate residents who provide manual labour or professional expertise through short term contractual agreements. The population is 40% Arab, 18% Pakistani, 18% Indian, 10% Iranian, and 14% Western. More than 95% of the population is Muslim.

Qatar has a relatively young population. The average-age statistics have been significantly lowered by the influx of relatively young male labourers from abroad. However, irrespective of this trend, the percentage of population aged greater than 60 is 3.1, up slightly from the 1995 figure of 2.1 (WHO, 2005). The average male life expectancy is 69.92, with females living slightly shorter spans than men (Qatari Ministry of Public Health, 2002). The birth rate is 16.07 births /1000 population (2000 est.), death rate is 4.19 deaths/1000 population (2000 est.), and infant mortality is 22.14 deaths/100 000 live births. Re-emerging global diseases like tuberculosis continue to be a burden on public health in the State with a prevalence of 65.4/100 000 (WHO, 2006). The State of Qatar is a ruling monarchy governed by a traditional emirate government where appointment of positions within the government structure at the national level is through the ruling family. Ten municipal locals exist in the State where recently officials have started being elected democratically.

Only two generations ago a large proportion of the Qatari population were desert dwelling nomads and Bedouins, continuously moving in search of food and water in a harsh arid and unfertile land. Today, their culture remains heavily influenced by their tribal past; it does not admit newcomers freely, and openly practices preferential nepotism in many aspects of politics, justice and commerce. The sudden influx of great wealth, modern technologies and western cultural and ideological influences have resulted in some beneficial and some significantly unhealthy cultural changes. Many Qatari nationals are amongst the richest people in the world, while others living in the country, particularly non-Qatari workers suffer from poverty and disempowerment. Because of the wide range of individual accessibility to the determinants of health, each of the numerous cultural groups has significantly different health risk factors, needs, and services, all depending, to some extent, on their racial ranking, based on country of origin. (Bracht, 1999).

In the 1700's Islam became the state religion in Qatar and today is strongly influential in political, governmental, legal (Sharia Law), and cultural sectors. Islamic traditions allow for polygamy (up to four wives), and until recently forbade divorce and homosexual relationships. (Divorce has recently been sanctioned, although this practice remains uncommon.) Homosexuality is still considered a crime, forcing the gay population underground. Their inability to seek medical assistance openly marginalizes these individuals' access to the health system that might otherwise have prevented their original infection, reduced complications, sped recovery, or reduced further transmission. This also reduces the collection of associated statistics with reportable disease conditions.

Both Qatari's and their resident labour forces appear to be suffering from elevated morbidity and mortality rates. In 2001, the average female Qatari could expect to live 5 years

less than the average Canadian (Canadian Institute of Health Information, 2004). Contrary to international norms, women are not living longer than men here. This may be due to less active lifestyles, less empowerment, lack of education, decreased participation in decision making, and limited access to health services, and the other determinants of health (Women Environmental Health Student's Focus Group, March 15, 2007). It is not proper in Islamic culture for a woman to workout, swim or run publicly without segregation, reducing greatly the opportunities for exercise.

The Ministry of Public Health (Appendix 1), (MOPH) registered 12,110 live births in 2002. In the same year, 1220 total deaths occurred. The first three leading causes of mortality (in all ages) were diseases of the circulatory system, external causes of death, and neoplasms (Qatari Ministry of Public Health, 2002). The number of deaths, and therefore, rates vary by sex and nationality. A total of 406 male, and 258 female Qatari's in the capital city died in 2002, giving a total of 664 deaths in nationals. The wealthy and poor populations that make up the expatriate statistics are not separated into categories. If these statistics were separated, the effects of poverty on this population would be better illustrated. For these populations, 449 male and 107 females died in 2002. The dying expatriate population tends to be far younger, either less than one year, or between 35 and 45 years of age. These people are predominantly here to work, are younger, and their underlying causes of death are not related to the natural aging process (Qatar Ministry of Public Health, 2003).

In Qatar, the political environment at the municipal level and the Health Agencies in particular are in great turmoil. The system as it stands today has been built on dynasties and silos where very little communication, and even less cooperation exists (Dr. Walsh, personal communication, March 15, 2008). Several agencies currently vie for health care dominance,

with the largest hospital, Hamad, assuming the principal role, above the National Health Authority. It has resulted in a system where several segregated offices provide similar, duplicative services.

A positive political force is seen in the initiatives of the Queen and her office, The Qatar Foundation. She recognizes the power of public health and prevention, and the health care needs of women and children in Qatar. Her organization has brought in Cornell Medical to teach prospective Qatari doctors, and is developing one of the world's top specialty teaching hospitals, focusing on women's and children's issues.

The sponsorship system in the State of Qatar is designed to assist the State in managing its human resource capacity and infrastructure both in professional and unprofessional jobs for expatriates; the building boom and the requirement for specialized and unspecialized labour continues. Countries like Nepal, India, Sri Lanka, Bangladesh and the Philippines are well represented in the State of Qatar. The sponsorship system provides the employer with the power of hiring the employee, determining the length of contract, salaries, working hours, etc. There is continually a turnover in staff because of contracts that are usually short term (less than 5 years). As a result, some employees may not have a vested interest in the quality of work performed particularly the building construction industry, resulting in cases of unsafe buildings and occupational hazards that are noticeably evident during construction. Occupational safety and the injuries associated in the workplace in the State of Qatar is a big public health problem. Sponsoring agencies in the State of Qatar often treat employees as dispensable commodities. Many employees are unprepared for jobs, with very little on the job training and often working in specialized fields, but have little or no training. The sponsors have ultimate control over their

employees, preventing them from taking on other jobs during their time as sponsored individuals.

3.0 METHOD

To critically examine the food safety system in the State of Qatar the method used was built on the foundation developed by the World Health Organization and its selection of food safety indicators important to building food safety systems and evaluating food safety capacity at the international level.

1. A literature review was conducted initially to help describe the attributes of the external environment and the internal environment in the State of Qatar which is particularly unique from a cross-cultural perspective.
2. Informal feedback was gathered during face to face interviews with department heads at the respective public sector agencies in the State of Qatar responsible for the delivery of food safety systems specific to retail food safety.
3. Strength, weakness, opportunity, threat (S.W.O.T.) analysis of the food safety system in the State of Qatar was conducted. The analysis was derived from data gathered from personal interviews with department heads in the State of Qatar.
4. A comparative analysis of selected measurable food safety indicators between Canada and the State of Qatar was carried out.

The indicators selected for the analysis of the food safety system in the State of Qatar were based on a multi-step approach. The World Health Organization has done extensive work in developed countries to promote the efficient and effective development of food safety systems. Capacity building and technical assistance to countries is one of the top priority areas of work in food

safety by the World Health Organization. The food safety indicators selected for this examination of retail food safety system in Qatar were in part derived from the indicators used by the World Health Organization/Food and Agriculture Organization of the United Nations (WHO/FAO) when evaluating food safety capacity in selected countries. The (WHO/FAO) is the expert in this field and has been supporting capacity building initiatives since 1989.

This model was used to evaluate food safety capacity in the State of Qatar. The examination of the food safety system in Qatar was based on gathering qualitative information using the following broad criteria as they pertain to the retail food safety sector and laboratory services. Laboratory services, while not directly related to retail food safety, has importance to support the identification of physical, microbiological, and chemical contaminants potentially found in food in the retail sector. Laboratory services support the identification of chemical and microbiological contaminants as part of a comprehensive national food safety surveillance system: The following indicators were selected and described in Table 3.1 for comparison purposes between Canada and the State of Qatar.

1. Food Law and Regulations
2. Food Safety Management
3. Inspection Services
4. Laboratory services
5. Information, Education, Communication and Training
6. Sustainable Human Resources

Table 3.1 describes the food safety indicators that the World Health Organization has historically used to evaluate food safety capacity along with representative questions that would be asked when evaluating food safety capacity on a national scale. Several other food safety indicators

were chosen that have not been used historically by the World Health Organization, but were derived for the present study from the factors identified in the environmental scan that may compromise food safety in the State of Qatar. Also, questions that were included in the survey based on Hazard Analysis Critical Control Point (HACCP) were identified as important components of a comprehensive national food safety strategy identified in the literature review.

Table 3.1. Illustrating Food Safety Indicators Used to Evaluate Food Safety Capacity in the State of Qatar

Food Safety Indicator	Descriptions of Food Safety Indicator	Utilized by World Health Organization to Evaluate Food Safety Capacity	Utilized to Evaluate Food Safety Capacity in the State of Qatar	Utilized to Evaluate Food Safety Capacity in Canada
Food Law and Regulations	Enforceable food laws and regulations	Yes	Yes	Yes
	Legal Definitions of unsafe food	Yes	No	Yes
	Preventive and holistic approach vs. a reactive model to reduce the risk of foodborne disease	Yes	Yes	Yes
	Updated food safety standards	Yes	Yes	Yes
	Evidence based approach	Yes	Yes	Yes
	Transparency in the law system	Yes	Yes	Yes
Food Safety Management	Policy and operational coordination at a National Level	Yes	Yes	Yes
	Strategy for securing funds and resources	Yes	No	Yes
	Setting standards and regulations	Yes	Yes	Yes
	Developing emergency response procedures	Yes	Yes	Yes
	Policy development and guidance	Yes	Yes	Yes
	Gender Equality Standards	No	Yes	No
Inspection Services	Inspecting premises for compliances with regulations based on HACCP principles and risk based practices	Yes	Yes	Yes
	All public retail food establishments are subject to government inspection.	No	Yes	Yes
	Food sampling during preparation, processing, storage, transportation or during a foodborne disease outbreak.	Yes	Yes	Yes
	Identifying food that is unfit for human consumption or deceptively sold to the consumer.	Yes	No	Yes
	Customized inspection software covering the entire inspection process.	Yes	Yes	Yes

	Staffing levels at the National Health Authority (Nationals and Non-Nationals and by gender)	No	Yes	No
	Opportunities by gender in the workplace	No	Yes	No
Laboratory Services	Adequate facilities for physical, microbiological and chemical analyses.	Yes	Yes	Yes
	Sophisticated instruments using official test methods.	Yes	No	Yes
	Qualification and skills of analysts.	Yes	Yes	Yes
	Certification, accreditation of laboratory personnel.	Yes	Yes	Yes
	Integration into national food safety system.	Yes	Yes	Yes
Information, Education, Communication and Training	The development and delivery of “train the trainer” programs.	Yes	Yes	Yes
	Professional development of existing food safety inspectors	No	Yes	No
Sustainable Human Resources	Quantity of personnel with adequate knowledge, skills and motivation within inspection service	No	Yes	No
	Quantity of personnel graduating locally from higher education schools in Environmental Health/Food Safety	No	Yes	No

Secondly, a critical examination of the food safety system in the State of Qatar was supported by sourcing out factual data from top government officials responsible for the planning, delivery and operational aspects of food safety departments in the State of Qatar from two ministries-the National Health Authority and the Ministry of Municipal Affairs and Agriculture. Informal feedback during personal interviews was gathered and summarized from stakeholders from these respective ministries who have considerable expertise in food safety systems in the State of Qatar. Furthermore, I have had professional working relations with each of these individuals as a Work Term Placement Coordinator in my current career position as an Environmental Health Instructor/Food Safety & Inspection Instructor with the College of North Atlantic-Qatar. These individuals have provided student mentoring opportunities for our graduating students with these respective authorities during work term.

Thirdly, the selection of capacity-building variables to be evaluated in Qatar were selected on the basis of my professional associations and experiences as an Environmental Health Officer/Public Health Inspector for ten years in Ontario with a provincial health unit and being a member of the Canadian Institute of Public Health Inspectors. The capacity- building variables identified by the World Health Organization for food safety systems are consistent with the roles/responsibilities of front-line public health inspectors employed with a provincial or federal authority in Canada. They support the evidence for best practices utilized in Canada by public health inspectors.

The strengths, weaknesses, opportunities, threats of the existing framework for food safety monitoring and surveillance in the State of Qatar has been compared/contrasted with the provincial/federal model in Canada to illustrate ways that the local system can improve its ability to manage the risk associated with foodborne illness and reduce the burden on the health care system, instill consumer confidence locally and globally, boost economic viability and most importantly, protect population health. Many of the fundamental aspects of a model which are working can now be applied to a food safety system in the State of Qatar. This comprehensive approach will empower State officials to put in place mechanisms for change to improve and enhance their approach to primary prevention methods based on accepted evidence-based practices found in other models.

Many determinants of health within the State will be identified to illustrate the challenges and opportunities unique to the population at large here in the State of Qatar (i.e. socio-cultural, technological, gender issues, political, environmental factors) which is different in other food safety monitoring and surveillance models typical in the provincial/federal model in Canada.

Regulatory frameworks for foodborne surveillance systems (Appendix 1) are most often governed by large government bodies-multi tiered in nature.

Fourthly, a comparative analysis was conducted on selected measurable food safety indicators between Canada and the State of Qatar. Fiscal capacity, human resource capacity, participation in international food safety system activities, health screening programs for food handlers, and gender equality and opportunity were chosen as indicators to compare between the two countries. These indicators were chosen in part where direct comparisons could be made between the two countries that impact national food safety strategies either directly or indirectly. Fiscal capacity and human resource capacity are important attributes of any government agency to support and develop sustainable food safety initiatives at the national level. Planning, coordination and delivery of food safety interventions at the government level can only occur with adequate, stable funding together with the capacity to retain, develop, and train qualified food safety officials.

Surveillance of foodborne diseases for selected pathogens; Giardia and Salmonella were compared between a sentinel health unit in Ontario which tracks, investigates foodborne disease with that of the State of Qatar. These two pathogens were selected as they are typical pathogens found in contaminated food and water supplies and they both contribute to the burden of foodborne illness nationally in both countries. They are also pathogens which are typically vastly under-reported to public health officials in Canada.

Participation in international food safety system activities was chosen as an indicator to provide a comparison between the two countries as to their level of involvement and commitment to the coordination of international food safety standards through the Codex Alimentarius Commission

Health screening programs for food handlers was used as a comparison between the two countries because a direct comparison between the two countries could be made as to what preventive medical screening of food handlers is mandated to reduce the risk to the public associated with the transmission of communicable diseases through food.

Gender equality and opportunity was used an indicator for comparison purposes to illustrate the discrepancy in the opportunities for women participating and accessing positions in each country and as a cross cultural comparison which also impacts human resource capacity building.

4.0 Limitations of Study:

The gathering of data which relied on face to face interviews from the critical examination is qualitative in nature and is in no way statistically significant information for quantifying capacity building functions in the State of Qatar. This critical examination is merely a qualitative evaluation with a results and discussion component. This document could be used as a primer for a more quantitative study using a quasi-experimental design in a later study. Secondly, the participants in the study were based on a small sample set of department heads at respective authorities (5 persons) from the National Health Authority and the Ministry of Municipal Affairs and Agriculture. Data collected during personal interviews could have been applied to a broader cross section of government officials to be inclusive of middle managers and front-line practitioners for a more thorough examination of capacity-building attributes in the State of Qatar at differing levels of expertise, job function and personal perceptions. This selection of participants was based on the convenience of having professional working

relationships with department heads from the respected Ministries that I have developed over the last 2.5 years as a resident of Qatar.

There are many confounding variables between these two countries which may limit direct comparisons in the S.W.O.T. analysis. Some of these confounders include, but are not limited to the following: environmental, social, cultural, genetic, political and population demographic differences between Canada and the State of Qatar. Furthermore, in some cases it was difficult to obtain comparative data within the same year for comparison purposes between Qatar and Canada. In some cases the data used was typical of the Middle Eastern region rather than Qatari data where there was an absence of literature or data found specific to Qatar. Canada has a more sophisticated national food safety system that has been studied and reported on to a greater extent in comparison to Qatar which is in its infancy with respect to its food safety infrastructure and the institutions in the country who report on it. As a result, it was more difficult to obtain literature relevant to national food safety activities in the State of Qatar as compared to Canada.

5.0 Interview Survey Method

Informal feedback using structured questions with the respective departments responsible for the delivery of retail food safety in the State of Qatar was gathered using face to face interview techniques. The questions were asked in a structured manner in the English language; further detail was provided about the question when the respondent requested it. There were no English language barriers noted during this interview process. The National Health Authority and the Ministry of Municipal Affairs & Agriculture Departments were contacted over the period of 3 months (April 2008 to June 2008). Data was gathered and recorded with a paper and pencil.

Respondent #1 through Respondent #4 were all asked the same questions with the exception of laboratory services questions which were asked to Respondent #5 only. The answers provided in the interview survey are a summary interpretation of the respondents' answers rather than direct quotes. Many of the answers provided by the respondents were similar and this is indicated below. Some questions however were answered differently and this is noted in the interview survey below with the respondent number after the respondent answer.

Respondent #1

Dr. Maan Al-Ani, Ph.D.
Food Safety Consultant
Ministry of Municipal Affairs and Agriculture
Doha, QATAR

Respondent #2

Dr. Mohammed Ali, Ph.D.
Head of Environmental Health Section
National Health Authority
Doha, QATAR

Respondent #3

Dr. Syed Shah, Ph.D.
Head of Communicable Disease Section
National Health Authority
Doha, QATAR

Respondent #4

Dr. Gail Chanpong, D.P.H
Director of Preventive Health-National Health Authority, Doha, QATAR

Respondent #5

Ms. Wassan Abdullah Al Baker, M.Sc.
Head, Central Food Laboratories
National Health Authority
Doha, QATAR

6.0 Interview Survey Findings

Food Law and Regulations

- **What enforcement powers do current public health inspectors have in enforcing Qatari food law?**

Because Environmental Health Officers in the respective Food Safety Departments are neither educated nor empowered, there is little to no inspection and enforcement taking place. (All respondents)

- **What food law standards are in place in the State of Qatar?**

Government inspection intervention programs that are enforceable only include the monitoring and inspection of public enterprises within the State. Government organizations are exempt from any law imposed or government inspection. Large food suppliers and retailers of food offering food to the public who are tied to the government are exempt from food inspection and enforcement. (All respondents)

- **How are the National Health Authority and Ministry of Municipal Affairs and Agriculture collaborating or dividing up their powers pertaining to food safety inspection?**

There is very little collaboration, coordination, integration of services, or harmonization of best practices under the regulatory framework that exists with the National Health Authority and the Ministry of Municipal Affairs and Agriculture Branch to recognize and establish program specific responsibilities by government bodies separately or collaboratively. (Respondent #1)

There is a division of duties between these two government sectors (National Health Authority and the Ministry of Municipal Affairs and Agriculture). It poses a challenge to the delivery of an integrated approach to food safety control-specifically related to food inspection and enforcement. (Respondent #2)

Both ministries have the power to inspect food premises but the ultimate enforcement role lies with the Ministry of Municipal Affairs and Agriculture. As a result, there are delays in food inspection practices and enforcement activities because of this division of power. (Respondent #2)

Health hazards associated with food at the time of inspection are often left unabated. Both ministries are currently working on a Memorandum of Understanding document to help define roles of the respective agencies for coordination and planning purposes. (Respondent #3)

- **What regulatory approach is taken to track, monitor and inspect food establishments in the State of Qatar?**

The registration, tracking of food establishments, their locations and the identification of their risk level has not been performed or established by any regulatory standard to monitor the safety of food businesses operating within the State of Qatar. As a result, many food premises have historically operated without public health inspections by Environmental Health Officers, often for many years, posing a greater risk to the public in acquiring foodborne illness. (Respondent #2)

Food Inspectors do little more than check “Health Certificates”(Appendix 1) of food handlers, a practice of little epidemiologic significance. Up to 95% of restaurants in the State have substandard conditions and should be closed. (Respondent #3)

- **How is the mandatory reportable disease regulation utilized in capturing health data pertaining to foodborne illness in the State of Qatar?**

The Communicable Disease Department of the National Health Authority was not notified of any diseases pertaining to the ingestion of food in a period exceeding 4 months, and has had difficulty establishing immunization programs due to poor interagency communication. (Respondent #3)

The State of Qatar has a mandatory reporting standard of 65 reportable diseases pertaining to infectious and communicable diseases that require follow-up health inspections and investigations. (All respondents)

- **Are there exemptions to food law inspection or any gaps that you see in the food inspection process of food retailers?**

Gaps exist in the food control regulatory framework for certain foods. Ice manufacturers deemed a food in the State of Qatar are not inspected in the State of Qatar. Ice manufacturing and its retail sale is often a regulated industry to protect the product from chemical, biological, physical hazards found within. In the State of Qatar there is no regulation or standard in the food safety system which governs ice manufacturing and retail. (All respondents)

Food Safety Management

- **How is the reporting of disease coordinated between Hamad Medical Corporation and the National Health Authority?**

Statistical and epidemiological analyses are practically negligible due to the lack of any real and accurate surveillance and data collection. The communication and coordination systems between Hamad Medical Corporation and the Communicable Disease Section of the National Health Authority (collection, interpretation, analysis of foodborne disease mandate) is practically non-existent. (Respondent #2)

There is lack of operational coordination at the National Level to track, monitor, inspect food premises or investigate foodborne illnesses. (Respondent #1)

There are several outside Qatari agencies with similar and /or competing agendas. Hamad Hospital, in absolute isolation, conducts its own Environmental Health investigations and inspections. So too does the Ministry of Municipal Affairs and Agriculture, Supreme Council of the Environment, and the Qatar Petroleum Company. Very little organization, coordination,

communication, standardization, or duplication considerations amongst stakeholders exist within a food control framework. (Respondent #3)

An example of the confusion this presents can be seen in the investigation of a Food-borne Illness Outbreak. The Ministry of Municipal Affairs and Agriculture and the National Health Authority both have the authority to inspect public places where food is handled, served, prepared, processed, transported. The primary enforcement agency is the Ministry of Municipal Affairs and Agriculture, Hamad Hospital may conduct epidemiological and microbial investigations, and the National Health Authority has an additional internal office (Communicable Disease Control section), who have a mandate to track, monitor and initiate investigations related to suspected foodborne illness outbreaks. (Respondent #3)

In reality, there is very little follow-up in standards or policies to conduct any sort of an integrated effort to investigate and follow-up with disease investigations based on accepted practices by the World Health Organization or the Codex Alimentarius Commission. (Respondent #1)

- **How does the Ministry of Municipal Affairs and Agriculture coordinate the inspection of food premises within its ten municipalities found in the State of Qatar?**

There is a lack of an integrated, intra-agency approach to food control amongst the department of the Ministry of Municipal Affairs and Agriculture itself. There are 10 municipalities operating as sub-offices under the auspices of the Ministry of Municipal Affairs and Agriculture all working as separate entities enforcing different standards and using their own municipal food regulations to enforce and promote standards in the public food retail sector. There is very little coordination at the Ministry office to integrate operational standards uniformly. (All respondents)

- **What job descriptions or policies does the Ministry provide for food safety inspectors?**

Within the food safety section of the Environmental Health Department at the National Health Authority there are no program policies that govern the food inspection system nor are there procedural aspects or protocols for food inspectors to follow during their course of duty. As a result, the department lacks an integration and coordination of common standards and use of best practices. The use of best practices using a modern approach is not being undertaken uniformly between inspectors in this department. (Respondent #2)

Furthermore, there are no job descriptions outlining their roles with the National Health Authority in this department. Job descriptions with policies and procedures pertaining to food inspectors' daily inspection functions and day to day operational framework do not exist. Inspectors often lack any sense of clear direction as to their role in day to day activities with the National Health Authority; all this without specified job descriptions. (Respondent #4)

Inspectors are often paid an arbitrary salary with no added financial incentive for graduates of specialized training programs similar to the one offered for Environmental Health Technology program at the College of North Atlantic. Food safety inspectors with or without specialized training are placed on the same salary scales as other inspectors. There is little or no recognition or value in the work accomplished by trained staff in Food Safety. (Respondent #2)

- **How are inspection activities and the tracking of inspections coordinated at the National level?**

The National Health Authority has an antiquated method of paper filing of all inspection and outbreak control activities within the Ministry level. Timely response by inspectors in outbreak situations is severely limited as a result. (Respondent #4)

Currently there are no means of accessing electronic documents related to food safety and outbreak investigations between departments within the National Health Authority or intra-agency communication with the Ministry of Municipal Affairs and Agriculture also responsible for food safety in the State of Qatar. (Respondent #4)

The Food Safety Inspection program is predominantly operated manually, with paper forms and antiquated filing systems. Inspectors carry clipboards and pencils into their investigations, with little or technological resources. Many of the ‘samplers’ employed by the Ministry of Municipal Affairs and Agriculture or the National Health Authority are using methods which are outdated, inappropriate and invalid in terms of intervention methods used to protect the health of the public from food safety hazards. (Respondent #3)

- **What food safety policies/procedures are in place with respect to the response to potential national or global food safety emergencies?**

The National Health Authority has been innovative leaders in the development and management of emergency procedures pertaining to Avian Flu Preparedness both in the State of Qatar and as the lead for Gulf Cooperation Council Countries in the Middle East. Educational packages based on current factual information pertaining to Avian Flu has been disseminated to large private and public sector employees as well being made available to the general public. The National Health Authority regularly participates in situational mock emergency practice exercises with other respective authorities in the State of Qatar-Hamad Medical Cooperation, Civil Defense, Local Police forces. Later in 2008 the National Health Authority will be the lead agency in implementing a mock emergency Avian Flu preparedness exercise with all Gulf Cooperation Council countries. (Respondent #4)

- **What restrictions if any are there for females employed as food safety inspectors in the State of Qatar?**

Up until now the Ports and Borders Health department of the National Health Authority responsible for the collection, inspection and allocation of all food intended for human consumption entering into the State from air, land and sea did not have any female employees in this department. The department head has not permitted opportunities for females to work in this department nor has the department head permitted female students of the College of North Atlantic-QATAR to participate in experiential learning in this department during work term with the National Health Authority. (All respondents)

There are gender inequities in the opportunities that exist to enter the workforce government food control sector. There are currently 10 males and 3 females employed as food safety inspectors in his department. Food safety and inspection programs with these ministries have enforcement standards attached to the program. The stereotype is that males will be more successful in implementing standards through enforcement activities compared to females in this culture. (Respondent #2)

The human resource dynamics of the government sector is slowly changing with more females entering the workforce and taking on professional roles, but there is still a gender gap evident in opportunities which are most apparent in the private sector. Qatari males have the envious position upon graduation in Food Safety & Inspection/Environmental Health in working for either the Ministry of Municipal Affairs and Agriculture or National Health Authority or for large petrochemical companies usually in a broad based position with the Health & Safety Department inclusive of Food control activities within the respected agency. (Respondent #3)

Women often don't have these same opportunities in the State of Qatar particularly in the private sector. Often, the male stereotype still exists that women are the child bearers and belong in the family home primarily raising children. (Respondent #2)

Inspection Services

- **What HACCP based approaches are taken by food safety inspectors conducting health inspections working in the State of Qatar?**

Evidence based practices during food inspections often are not being employed and in no way resemble the risk based approach similar to the Hazard Analysis Critical Control Point System of food safety. The majority of inspectors in the department have never been trained in Hazard Analysis Critical Control Point (HACCP) systems. (All respondents)

- **What HACCP based approaches are food safety inspectors utilizing with respect to enforcement of the law?**

The enforcement activities taken on my inspectors in collaboration with the Ministry of Municipal Affairs and Agriculture are not risk based approaches to food protection. Monetary fines or closures of food premises often are not associated with severe food safety infractions that would normally compromise public health and safety. (All respondents)

- **Are all public food retail establishments subject to government inspection?**

Gaps exist in the food regulation to encompass all public food establishments that are subject to food inspection. Work camps are considered a high risk food establishment for a variety of reasons: they provide for a vast number of prepared meals to workers in the oil and gas sector, the preparation and processing of meals is done through a multi-step approach, the vast majority of food handlers have never been trained in basic food handling procedures necessary to protect the health of the public from undue risk associated with food. (Respondent #3)

The government inspection of work camps are essentially exempt from the regulations as they are considered private entities. (Respondent #1)

- **How many public health inspectors/food safety inspectors are employed by the National Health Authority categorized by qualifications and nationality?**

Environmental Health Inspection is newly recognized, and there are few formally trained Environmental Health Officers/Public Health Inspectors (EHO's) to conduct comprehensive food safety program surveillance programs using modernized approaches. (All respondents)

There are a variety of inspection personnel working at the National Health Authority with differing qualifications and training. Some of the existing front line staff are untrained and sometimes only hold a high school diploma. There is no certification body within the country which accredits the program or provides minimum standards or competencies to address food safety criteria in the State of Qatar. There are thirteen food safety inspectors-ten of which have been trained at the diploma level at Higher Institutes in Bahrain, the Emirates and the College of North Atlantic-QATAR and three staff employed with high school levels. The following chart illustrates the public health staff team by discipline (National and Non-National).

(Respondent #4)

Table 6.1 Illustrating the Number of Public Health Inspectors/Department Heads Employed by the National Health Authority-National and Non-Nationals

	National	Foreign National
Senior Staff	112	52
Junior Staff	52	90
TOTAL	164	116

Table 6.2 Illustrating the Public Health Team by Role at the National Health Authority

	National	Foreign National
Clinicians	0	33
Health Inspectors	76	24
Technicians	32	31
Other Technical	30	11
Administrative	26	17
TOTAL	164	116

Source: National Health Authority-State of Qatar Department of Public Health - March 2008

- **What procedures/protocols are in place to sample food materials in the State of Qatar for potential harmful microbiological contaminants?**

Risk based approaches are not the normal approach to sampling of food materials to ensure protection of the food supply during routine inspections of food premises based on HACCP approaches. (All respondents)

Often low risk foods are being collected and submitted by inspectors to the Central Laboratory which do not normally support the growth of pathogens in the food. There is no systematic approach to categorizing high, medium and low risk food items submitted for analysis based on HACCP principles along the food continuum; receiving, preparation, storage, transportation or during an outbreak. Also, the principles of aseptic specimen collection and representative sampling from bulk lots of foods from the various ports; sea, land and airports is not being followed in any systematic, organized manner to identify hazardous food items. Furthermore, there is no procedural coordination between the National Health Authority and the Ministry of Municipal Affairs and Agriculture for systematic sampling of suspected foods implicated in active foodborne illnesses outbreaks occurring in the State of Qatar. (Respondent #5)

Laboratory Services

- **Are the facilities adequate for physical, microbiological and chemical analyses of retail food?**

Although the laboratory is equipped with state of the art, modern, sophisticated, analytical instruments for the analysis of physical, chemical and microbiological parameters of food items(i.e. advanced instrumentation methods for chemical analysis of foods such as gas chromatography, polaroscopy, atomic absorption spectroscopy) the building structure does not facilitate good design. The equipment and instrumentation is not located strategically to prevent cross contamination, nor is the building ventilation systems or structural components (floors, walls, ceilings) satisfactory. Accreditation bodies such as the International Organization for Standardization (Appendix 1), (ISO) for laboratories would not be able to begin any such international accreditation for food safety management systems of this laboratory until such time this facility is relocated into an approved ISO design. (Respondent #5)

- **Is the laboratory accredited by an international body?**

The laboratory has a future plan for accreditation under ISO standards that encompass facility design, official methods, quality control and qualifications of laboratory personnel. Without accreditation, the quality of service and redundancies built into a 3rd party inspection system of the laboratory setting cannot be met. There is not one single recognized international standard utilized in the laboratory but rather many different international standards. Official methods, accuracy and validity of sample results in the food safety system are often called into question. (Respondent #5)

- **What international standard does the laboratory use to compare microbiological testing results of food samples for safety?**

The laboratory does not use an international Codex Alimentarius standard to evaluate food safety quality and safety. Instead, the laboratory uses a mix of standards employed by World Health Organization or the Gulf Cooperation Council.

There is distrust with sample results (both food and municipal water) that have been collected from inspectors from the Ministry of Municipal Affairs and Agriculture. Improper calibration, validation of instruments is inaccurate partly due to the fact the personnel operating are not formally trained. (Respondent #5)

- **What are the qualifications of the laboratory staff working in food safety quality control?**

There are no formally trained laboratory technicians employed with the Central Laboratory. Rather, the personnel working in the analytical departments analyzing food and water items are expatriates holding professional Bachelors, Masters or Doctorate degrees operating these instruments. (Respondent #5)

- **How is the Central Laboratory integrated into the national food safety system?**

The Central Laboratory is the sole laboratory for the provisions of laboratory service for the entire public food service food safety system in Qatar for both agencies responsible for food safety control-the National Health Authority and the Ministry of Municipal Affairs and Agriculture. However, the strength of the laboratory goes so far as to its ability to test and evaluate food materials across the entire food continuum based on HACCP principles. (Respondent #5)

- **What procedures are in place to ensure the quality of samples received are representative of the food material they originate from?**

Many sample submissions received at the laboratory are not able to be tested because of improper collection of the sample by Ministry officials (i.e. improper sample containers, insufficient cold chain, and expired samples). Samples are checked upon receipt at the laboratory for quality control.

It is the mandate for the laboratory to issue certificates for specific food types that enter the country through the air, land and sea ports. Up to 30% of food entering into the country is making its way to the public retail sector in grocery stores and markets unchecked by government officials. It is a serious violation that calls into question the ability to integrate all services along the food continuum with laboratory services to ensure a safe food supply.

Government corruption is another possible reason for this phenomenon. (Respondent #5)

- **What is the National Health Authority "Train the Trainer" program and how is it to be delivered?**

The National Health Authority has signed an agreement principle with the College of North Atlantic to develop and deliver a broad based Environmental Health program to up to 20 Masters Levels Nursing Educators employed by the National Health Authority. The program will be based on competencies recognized by the Canadian Institute of Public Health Inspectors professional organization inclusive of food safety competencies. The program will be translated and delivered in Arabic to existing food safety inspectors and environmental health inspectors without formal education in these capacities. (Respondent #4)

- **What professional development opportunities are available for existing public health inspectors at the National Health Authority?**

The National Health Authority offers monthly in-service workshops to all staff inspectors in the Preventive Health Department along a broad base of competencies. (All respondents)

There is sufficient fiscal capacity to support graduating students from the College of North Atlantic and other institutions abroad in traveling abroad to complete Honours Science degrees in Environmental Health/Food Safety. (Respondent #2)

Four female graduates from the College of North Atlantic 2007 graduating year have been accepted to attend the 2 year fast track program at Ryerson University, Toronto, Canada with full scholarships beginning in the fall of 2008. (Respondent #4)

- **What do you see as barriers in building and maintaining human resources at the National Health Authority?**

The quantity and quality of inspections conducted in the department is suspect at best partly due to the fact the Department Head of Environmental Health is disempowered to discipline staff within the department for conduct or job performance. As a result the status quo remains until such time more qualified; ethically motivated graduates enter into the department. (Respondent #2)

These are examples of nepotism and family ties that exist as a cultural norm which disempower the Department head to hire and fire staff within his department. (Respondent #1)

- **How are new graduates of food safety or environmental health integrated into the workforce at the National Health Authority?**

The mentoring of new graduates at the National Health Authority is often times unsupervised, lacking the human resources of qualified staff to train and support food inspection capacity. (All respondents)

- **What are some barriers to building and maintaining a sustainable workforce?**

Competitive salaries in the government sector food safety departments are barriers to building adequate human resources. The public sector of these two ministries is also challenged to recruit staff (predominantly males) because of salary discrepancies between the public and private sector. As an example, petrochemical companies typically offer two times the salary a new graduate would be offered either working for the National Health Authority or Ministry of Municipal Affairs & Agriculture. (Respondent #2)

On salary alone a recent graduate of the Environmental Health Technology program of the College of North Atlantic who was recently employed in a Health & Safety capacity with Ragas is earning a salary of 17 000 Qatari Rials (Appendix 1) monthly while graduates working at the National Health Authority start at a salary of 9 500 Qatari Rials monthly. (Respondent #4)

7.0 A S.W.O.T. (Strength, Weakness, Opportunity, Threat) Analysis of the Current Retail Food Safety System in the State of Qatar

Strengths

Health Screening Programs

The development of the public health infrastructure in the State of Qatar has been vastly attributed to the influx of skilled and non-skilled workers (originating from countries like India and Pakistan as examples.) The population of Qatari nationals represents about 20% of the total population while the remaining 80% is an expatriate community. (WHO, 2005) As a result there are a variety of disease patterns found in the State of Qatar due to the presence of persons from differing parts of the world all with a range of endemic disease patterns. The State of Qatar is managing population health from the influx of migrant workers with a progressive, pro-active

medical screening program approach for selected communicable diseases such as Typhoid Fever, Tuberculosis, Hepatitis B, and Human Immunodeficiency Virus (HIV) for all entrants to the State of Qatar; this is supplemented with an enhanced screening program to all personnel working in retail food service sector. All expatriate entrants to the State of Qatar (over the age of 12 years and those employed in Qatar) must be screened for these diseases in order to gain residency to the State allowing them to work or attend any of the private or state schools. They must satisfy minimum health requirements through the Medical Commission Section (Appendix 1) of the National Health Authority. The Food Handler Unit of the Medical Commission issues yearly renewable “health certificates” to all food handlers in the State provided a negative screen for the following diseases: Typhoid Fever, Tuberculosis, Hepatitis B, Human Immunodeficiency Virus (HIV). Although HIV transmission is not a risk through food it is a requirement in the State of Qatar that all entrants be screened. The program is currently advancing its technological and communication capacity by implementing a State wide electronic tracking database.

The Ontario model which protects the food supply from the transmission of disease from food handlers through the food medium is illustrated through prescriptive law. An example in the personnel section of Food Premises Regulation 562/90 under the authority of the Health Protection and Promotion Act stipulates that food handlers be free from an infectious agent of a disease that could be spread through the food medium, and only under certain circumstances would a medical officer of health require a food handler to submit to a medical exam to confirm the absence of any infectious agent. This model is reactive in nature compared to a pro-active approach taken under Qatari law. Similarly, the Fish Inspection Regulation and Meat Inspection Regulation in Canadian federal law have no provisions in the regulation for any food handler to

submit to tests confirming the absence of an infectious agent (a pro-active approach) that may be passed onto the food through the food handler.

Fiscal Capacity

The State of Qatar has the luxury of having proven natural gas and oil reserves that are sustainable for upwards of at least 23 years. The petroleum industry is the cornerstone of Qatar's economy accounting for 70% of total government revenue with Qatar having the 3rd largest liquid natural gas reserves (LNG). As a result of this revenue and a general increase in the price of barrels of oil the State of Qatar has realized a real GDP growth rate of 24% (2006) and the highest GDP per capita income in the world surpassing Switzerland at a per capita income of \$75,900 U.S. (Central Intelligence Agency, 2007). Comparatively speaking, Canada is still considered a wealthy country with a much lower per capita income at \$ 38 200 U.S. (Central Intelligence Agency, 2007). The petroleum industry has boosted its economy enormously in the last two decades. The State of Qatar spends the greatest amount of money on health care per capita in the Middleast at \$1 100 U.S. (Dr. Walsh, personal communication, March 2008) and spends 8% of the government's total expenditure on health care. Canada, on the contrary, in 2006 spent \$4 548 per person and it has continued to increase its total health expenditures each year. (Eastern Mediterranean Office of the World Health Organization, 2004). Furthermore, there is a discrepancy between spending on health care as a function of % of GDP as Canada spends approximately 9.8% while Qatar spends approximately 2.3% (Hamad Medical Corporation, 2007)

Because of the enormous wealth in Qatar, the State of Qatar has the envious task of having the potential to increase and/or diversify its budget to increase spending in the preventive health sectors of the National Health Authority and the Ministry of Municipal Affairs and

Agriculture to improve capacity in food safety systems and build solid foundations for preventive health programs in specific areas related to food safety monitoring and surveillance.

Weaknesses

Legislative Authority

There is no Health Act, or subordinate Regulations, no trained Environmental Health Officers (EHOs) or infrastructure in place to adequately accept trained EHOs upon their graduation or to support the functions of existing staff in their roles as food protection officers. According to the Food and Agriculture Organization/World Health Organization during a regional meeting on Food Safety for the Near East in 2004; food legislation in the countries of the Gulf Cooperation Council (Appendix 1) have a set of regulations and standards that are characterized by fragmented enactments under the mandates of Ministries of Agriculture and Ministries of Health and Municipal authorities Furthermore, the country uses various food regulations from various authorities with no harmonization of law. As an example the ten municipalities operating in Qatar under the auspices of the Ministry of Municipal Affairs and Agriculture used a variety of regulatory frameworks for food safety control; Gulf Cooperation Council standards, World Health Organization standards or Qatari food standards are used; all independently of each other in the ten municipalities in the State of Qatar. In contrast, provincial or federal standards used in Canada rely on established statutory law originating in Canada for use in the retail food safety sector inspection and enforcement program areas.

On an international scale, the Canadian government is an active participant in the Codex Alimentarius Commission. The Codex Alimentarius commission and member countries participation levels illustrate the ability of a country to engage in activities protecting the health of consumers at an international level through collaborative efforts and through the use of

harmonized food safety standards as an example. The strength in Codex is in its ability for a country to integrate international standards into their food safety systems, assess and manage food safety risk internationally and actively participate in trade activities with other member countries. Furthermore, involvement in Codex is a mechanism to protect the international food safety community from diseases which are indigenous in one country from being transmitted to other countries. (Food & Agriculture Organization of the United Nations/World Health Organization, 2005).

There is a large discrepancy between participation levels by Canada and by the State of Qatar. For example, in forty selected Codex meetings during the years 2000-2002 Qatar participated in 10% of Codex meetings while Canada participated in 100% of Codex meetings.

Surveillance of Foodborne Diseases

There is little to no accurate epidemiologic data being collected and analyzed in the State of Qatar. Without surveillance and data collection, there can be no accurate identification of needs, trends, program effectiveness and potential improvements in food safety. The Hazard Analysis Critical Control Point (HACCP) system should be adopted in the government's inspection/investigation practices in the public food service sector. This will focus the work on a more risk based approach to key in on the areas of the food safety continuum which are most likely to increase the risk factors contributing to the onset of foodborne illness. Also, the capacity building of surveillance officers in the State of Qatar to manage foodborne disease outbreaks needs to be addressed. Once an outbreak (Appendix 1) has been identified methodologies to carry out the investigation must be followed. Methodologies for collecting health data pertinent to the investigation should be followed (i.e. attack rate tables, line listing, specimen collection, establishing case definitions, communication of findings). The Canadian

Restaurant & Foodservices Association estimates the burden of illness ratio at 1 case for every 4 persons in the Canadian population similar to the Center for Disease Control in the U.S. which estimates the burden of foodborne illness at 76 million cases per year or approximately 1 case for every 4 persons (Mead, et al.1999).

The reporting of two common foodborne pathogens to the respective health authorities for Salmonella and Giardia lamblia were compared between the two selected geographical areas for comparison with a representative health authority in Canada. For comparison purposes the most recent statistics for reported diseases were obtained for Qatar in 2004 and the Region of Waterloo between the midpoints of 2005 to 2006; both of which have a mandatory reporting requirement for foodborne illness prescribed by law. The Region of Waterloo with a population of 480 000 in 2005/2006 had a reporting rate of illness with Salmonella at 31.3 per 100 000 (Public Health Agency, 2006) while the Qatar with a population in 2004 of 755 000 had a reporting rate of illness with Salmonella of 11.8 per 100 000 population. Giardia infections were reported at a rate of 11.2 per 100 000 in the Region of Waterloo over the 2005/2006 year while Qatar in 2004 reported illness associated with Giardia at 2.6 per 100 000 population. Vastly under-reported cases of foodborne disease in Canada and the U.S. are well known. The above statistic may suggest a similar under-reporting trend in Qatar and to provide anecdotal evidence that enhanced surveillance activities both passively and actively are required in the State of Qatar to better track and manage foodborne disease.

Program Policy/Procedures and Job Descriptions

The departments operating under the umbrella of Preventive Health at the National Health Authority operate their front line staff as community health advocates without official policy on their defined roles and responsibilities. There is little or no procedural documentation

outlining their day to day roles as professional health inspectors/food safety inspectors in the community nor are there job descriptions for staff working as health inspectors/food safety inspectors or any other primary prevention officer working in this department. New graduates soon become frustrated with lack of direction, support and mentoring provided within the Preventive Health Department to successfully engage their learning profile that was gained while attending such schools as the College of North Atlantic in Qatar.

Opportunities

Human Resource Capacity in National Food Safety Systems

The Environmental Health Technology Program and the Food Safety and Inspection program are both customized programs in the State of Qatar to graduate employees for a potential role with the government organizations of the NHA or the Ministry of Municipal Affairs and Agriculture in food safety preventive health positions. They are the sole providers of training in the State of Qatar to build human resource capacity. Table 7.1 provides for a comparison between the two countries.

Table 7.1 Illustrating Human Resource Capacity of Public Health Inspectors/Food Safety Inspectors between Canada and the State of Qatar

Indicator	Canada	State of Qatar	Reference
Human Resource Capacity	Per capita student enrolment in Environmental Health Schools 0.54 students/ 100 000 population	Per capita student enrolment in Environmental Health Schools 3.86 students/ 100 000 population	Institutional Research & Planning-College of North Atlantic-QATAR, 2007
	Ratio of health inspectors/per population 1 per 16 500	Ratio of health inspectors/per population 1 per 3 710	Andrew Papadopolous (personal correspondence, April, 2008) Ministry of Municipal Affairs & Agriculture (2008) Bourne. (2005)
	Graduating rate of Food Inspectors/Environmental Health Officers 0.31 per 100 000	Graduating rate of Food Inspectors/Environmental Health Officers 0.51 per 100 000 population	Andrew Papadopolous (personal correspondence, April, 2008)
	# of Schools Training Public Health Inspectors/ Food Safety Inspectors 5	# of Schools Training Public Health Inspectors/Food Safety Inspectors 1	

Health Monitoring and Surveillance Communication Systems

Many shared responsibilities currently for Food Safety & Inspection initiatives at the government level in the State of Qatar specific to the National Health Authority and the Ministry of Municipal Affairs and Agriculture. Based on my personal experiences and opinions working with the National Health Authority and the Ministry of Municipal Affairs and Agriculture as a work placement coordinator for students at the College of North Atlantic (Appendix 1) there is a lack of clarity between stakeholders to set out priorities, health policy analysis, and harmonized national health targets. The National Health Authority within its department of Preventive Health lack inter-agency communication and integration of program planning, health inspection, and health promotion services. The Ministry of Municipal Affairs and Agriculture, also with a mandate to protect the health of the people by minimizing exposure to foodborne hazards, often replicates many of the inspection services and regulatory initiatives put forth by the National Health Authority. Further to this there is a poor reporting record of disease conditions from the hospitals (Hamad Medical Corporation) to the National Health Authority. The National Health Authority is ultimately responsible for the tracking and surveillance of a total of 65 reportable diseases (Dr. Syed Shah, personal communication, March 2008).

It is fundamental that reportable diseases such as foodborne illness in the State of Qatar are diagnosed and ultimately reported to health officials of the Communicable Disease Department for timely follow-up and investigation to lessen the disease burden. Even more pronounced is the vast under-reporting of foodborne illness to State officials at the Ministry compared to reporting systems in Canada (Dr.Syed Shah, personal communication, March, 2008). Program planning and human resource capacity can only be determined when systems are in place to assess a baseline incidence of foodborne illness. A comprehensive, integrated

National Health Information System could help improve the reporting behaviours of health care diagnosticians to the National Health Authority.

Collaborations with External Agencies

Local collaborations must be made with the numerous international expert organizations, (Cornell, College of the North Atlantic-Qatar, Qatar Foundation, Specialty Teaching Hospital) being established in the community. This will create communications, expert assistance, and access to pertinent research. Collaborations with other agencies conducting similar mandates might help alleviate the duplication now in existence; either working together, or specializing will improve effectiveness.

New western trained Environmental Health Officers/Food Safety Inspectors are graduating in the State with three graduates in 2006, and ten graduates in June 2007 and four graduates in June 2008, offering real expertise in epidemiological, health promotion, and food safety inspection/investigation principles. They will also offer more cultural appropriateness (to Qatari's), and have been trained to recognize the importance of including subcultures in the development of their specific programs. They will begin training existing untrained inspectors and use them as technicians to improve the efficiency of the initial limited number of trained inspectors. This two tier system, if culturally feasible, will provide relatively untrained assistants to sample and conduct simple routine inspections, freeing up inspectors for more complex community-based investigations and programming.

The new graduates have also been trained to expand the mandate of existing programs into Health Education and Promotion (i.e. food handler education programs, food safety initiatives in school age children) a far more powerful technique of improving the public's health and safety than inspections alone. Recently, the National Health Authority has begun a

collaborative effort with the College of North Atlantic-Qatar to build capacity in the State related to Communicable Disease Control and Food Safety protection. The program is in its infancy; its goal is to develop 'train the trainer' modules. It is taught by Environmental Health/Food Safety & Inspection professionals to specialized health educators at the National Health Authority (approximately 6-10 persons). The ultimate goal is to provide professional development training to the approximately 100 current untrained front line staff in the Preventive Health Department of the National Health Authority. These types of programs will provide real opportunities to raise the level of expertise in each department based on recognized, modern Canadian food safety competencies with working objectives of providing skills to enhance evidence-based practices in the field, which in turn should provide the means to help reduce the burden of illness associated with foodborne illness in the State of Qatar.

Technological capacity

An opportunity exists to utilize the technological capacity within the State to incorporate a comprehensive Health Information Computer System (H.I.C.S.) for data collection from all premises in the service sector, post inspection results and provide the means to centralize the food inspection/investigation program within the State of Qatar. This would include inspection, investigation, sampling results, educational events, morbidity and mortality data that would be entered into the H.I.C.S. by a designated data entry clerk. The data will be evaluated for service quantity and quality, injury and illness rates by demographic and geographic category and trends and appropriateness of intervention strategy. More importantly, the improvements in a State-wide Health Information Computer System will inherently equip diagnosticians in the State to better manage and report illness provided the training capacity has been realized. Anecdotal evidence would suggest foodborne illness is a vastly under-reported disease in the State of Qatar.

Health Promotion Model versus Curative Model

Current models in the State of Qatar focus on health care systems with little emphasis on addressing preventing disease before it happens. (Borthwick, Horton, 2005). Foodborne illness is no exception. The Communicable Disease section of the National Health Authority responsible for the surveillance and management of 65 reportable diseases in the State of Qatar including food borne illness focus their efforts on managing foodborne illness from suspected reported cases which are treated at the primary care hospitals. They rely on communication from Hamad Medical Corporation to follow-up on suspected cases and initiate a foodborne illness outbreak response (Dr. Maan Al Ani, personal communication, 11, 2008). Furthermore, the inspection approach to preventing foodborne disease before it happens in Qatar is not based on a HACCP based approach typical of World Health Organization's model to evaluate food safety capacity at the national level. Curative models are increasingly more expensive to maintain and ineffective in addressing emerging health issues which are common to a global society. It is not uncommon in Middle East and North Africa Region (MENA) to have hospital occupancies only at 65% with many governments still focused on expanding the number of hospital beds to accommodate future population growth (Borthwick & Horton, 2005).

The World Health Organization (2005) has identified lifestyle patterns a major disease concern for citizens of the State of Qatar reflective of their affluent society. Typically, high rates of cardiovascular disease, diabetes, cancer, obesity and road traffic accidents are reflective of poor lifestyle choices. Health promotion campaigns to target specified populations are certainly an area of study that could be greatly enhanced and developed to its full potential in the State of Qatar. Empowering individuals through appropriate education and awareness to make informed

lifestyle choices would have enormous benefits in lessening the burden of curative health spending and improving population health.

Threats

Qatarization

The sponsorship system for expatriates working in the State of Qatar has been instrumental in attracting the necessary unskilled workers (primarily building construction) and skilled workers, both in the private and public sector of Qatar's economy for temporary periods of time. The Ministry of Labour and Social Affairs has a mandate for all employers to ensure a minimum percentage of Qatari's are working in their respected fields (both the private sector and the government sector). The State of Qatar has a mandate for Qatarization of both the National Health Authorities Preventive Health Departments and the Ministry of Municipal Affairs and Agriculture's Food Safety Section within ten years. Part of the Qatarization plan is to have Canadians at the College of North Atlantic train and develop local Qatari food safety professionals over this time frame with the overarching goal to operate and sustain their own human resource capacity at all levels (field staff, management and upper management) within these respective departments. However, there are many challenges to this model. Almost exclusively, Qatari's career opportunities are white collar positions with the petroleum sector or various public health ministries and not field staff or entry level positions.

The majority of upper management positions in the State of Qatar including those in the government food safety sector are being managed by skilled expatriate professionals initially, with a mandate to build capacity in Qatar for Qatari's to become self-sufficient in their own economy in the future, whilst at the same time training Qatari individuals to be successful,

competent replacements. As an example, the Chief Executive Officer of the National Health Authority (an Australian expatriate) is in charge of executing and managing the mandate and budget of both health care and the preventive health departments. The department head of Preventive Health is also a highly skilled expatriate professional responsible for the delivery and execution of the seven preventive health programs in the State of Qatar inclusive of Food Safety. Capacity building and targeting self sufficiency does not happen overnight. There is a threat in placing Qatari's in professional, managerial roles with this department before the necessary training, organization, and execution of programs is carried out as it was intended which may undermine the value of the work done in the Preventive Health department to date.

Career Recruitment/Retention in Qatar

In general, Health Sciences fields including Food Safety & Inspection Programs in the State of Qatar do not have the same prestige or career development opportunities that a similar field of study would offer in Canada. Qatari's are not attracted to these types of careers which involve front-line work in their day to day routines. For example, enrollment in the program of Food Safety & Inspection at the College of North Atlantic in Qatar is comparatively lower than the more sought after programs in Engineering and Business. Focus group meetings with industry and government prior to the development of the Food Safety & Inspection program identified an immediate need for 80-100 food safety inspectors in the State of Qatar. This demand will continue to increase as the economy emerges, the population increases and the commercial development of retail food establishments and processors continue. Despite aggressive campaigns like career days, information booths at shopping malls, radio and newspaper advertising, the State has only been able to successfully enroll 16 students into the

program of study to date, most of them Qatari, fully sponsored with tuition paid for the duration of study and a monthly salary while attending school. Furthermore, with a relatively low salary structure for front-line staff upon graduation in the public sector of Food Safety & Inspection departments compared to the private sector jobs (Oil & Gas Industry), the recruitment and retention of recent graduates is a threat to capacity building in food safety monitoring and surveillance in the State of Qatar. The ability to successfully Qatarize, the food safety sector the way it was intended to remains a threat to the future implementation of a successful food safety and monitoring system in the State of Qatar.

Attraction and Retention of Global Workforce

The development of the health care system inclusive of Preventive Health (Food Safety Inspection and Monitoring) strongly relies on the expertise of foreign trained professionals. Currently in the State, the department heads and senior staff at the National Health Authority are predominantly foreign trained non-nationals. According to the Preventive Health Department of the National Health Authority in 2008 there are currently 112 nationals in senior positions and 52 non-national senior positions. The director of Preventive Health at the National Health Authority is an American citizen and the Chief Executive Officer of the National Health Authority is an Australian citizen. The capacity building in preventive health relies heavily on these persons to mentor, supervise, train, deliver, and execute food safety programs in the State of Qatar. There is little or no expertise (locally trained) in food safety monitoring and surveillance to effectively operate day to day programming in the government food safety sector. It is difficult to predict if Preventive Health Programs like food safety and monitoring could work effectively without foreign trained workers.

There has to be credit given to the progression as we know it, but it will take considerable time to completely Qatarize the workforce. The growth and development of preventive health programs like food safety and monitoring hinges on the continuity of human resource capacity building. Dr. Michael Walsh, the Chief Executive Officer of the National Health Authority recently spoke on the steps needed in Qatar to meet the demands of health care “The health industry in Qatar is at a trajectory with the economy, and if challenges such as attracting and retaining global health workforce and training skills of the existing staff are not overcome, the industry could go in reverse” (Gulf Times, January 23, 2008). Most foreign trained workers (mainly because of sponsorship laws and tax laws) work in the country on short term contracts of less than five years. The opportunity to retain knowledgeable staff who has gained five years experience in the State of Qatar for longer periods of time may be a moot point if their contract only allows a resident to stay in the country for five years or less. Furthermore, depending on the country, certain tax laws prevent staff from staying in countries while remaining a resident of their country of origin. As an example, Canadians working abroad for the College of North Atlantic who have resident ties to Canada are only permitted to stay for up to a maximum of five years as per Canada Customs and Revenue Agencies Tax Law Ruling (Special Work Site Exemption).

Recruiting staff to fill newly created positions and vacated positions within the Ministry is an ongoing challenge. Most recruitment packages for western trained staff are quite generous but the incentive packages are often not enough to attract the necessary staff to fulfill the needs for services in Preventive Health. Global food safety protection programs and staffing demands are increasing in depth and scope with the advent of new emerging diseases (i.e. Avian Flu)

emergency response (i.e. bioterrorism threats), international trade, and food security issues. As a result, most developed food safety programs in many countries have ample job opportunities for all professional graduates and career food safety professionals within their own country including Canada. Most food safety professionals would not have to travel abroad for food safety careers in emerging preventive health programs like the one found in the State of Qatar.

Table 7.2 Illustrating a Comparative Analysis of Selected Indicators in the State of Qatar and Canada Important to the Management of Food Safety Systems

Selected Food Safety Indicator	Canada-Comparison	State of Qatar-Comparison	Strength, Weakness or Opportunity	Reference
Fiscal Capacity	Gross Domestic Product(GDP)	Gross Domestic Product	STRENGTH	Central Intelligence World Factbook, 2008
	\$38 200 U.S dollars (2007)	\$75 900 U.S. dollars (2007)		
	Health Care spending per Capita	Health Care spending per Capital	OPPORTUNITY	World Health Organization
	\$4548 per person	\$1100 per person		
	% of GDP spent on Health Care_9.8%	% of GDP spent on Health Care_2.4%	OPPORTUNITY	World Health Organization
Surveillance of Foodborne Diseases	Reporting of Foodborne illness for Selected Food borne Pathogens between Region of Waterloo Health Authority (2005/2006) and Qatar (2004)	Reporting of Foodborne illness for Selected Food borne Pathogens between Region of Waterloo Health Authority (2005/2006) and Qatar(2004)	WEAKNESS	National Health Authority (2004)
	Salmonella	Salmonella		
	31.3/100 000	11.8/100 000		
	Giardia	Giardia		
	11.2/100 000	2.6/100 000		
Human Resource Capacity	Per capita student enrolment in Environmental Health Schools	Per capita student enrolment in Environmental Health Schools	OPPORTUNITY	Institutional Research & Planning-College of North Atlantic-QATAR, 2007
	0.54 students/ 100 000 population	3.86 students/ 100 000 population		
	Ratio of health inspectors/per population	Ratio of health inspectors/per population		Andrew Papadopolous (personal correspondence , April , 2008)
	1 per 16 500 population	1 per 3 710	STRENGTH	
	Graduating rate of Food Inspectors/Environmental Health Officers	Graduating rate of Food Inspectors/Environmental Health Officers		Ministry of Municipal Affairs & Agriculture (2008)
	0.31 per 100 000 population	0.51 per 100 000 population	WEAKNESS	Andrew Papadopoulos (personal communication, April, 2008)
Participation in International Food Safety System Activities	Participation in selected Codex meetings during 2000-2002 - 100%	Participation in of 40 selected Codex meetings during 2000-2002 - 10%	WEAKNESS	Food & Agriculture Organization/World Health Organization, 2005
Health Screening Programs for Food Handlers	Medical screening of selected communicable diseases	Medical screening of selected communicable diseases	STRENGTH	Medical Commission-National Health Authority, 2007
	No mandatory screening for food handlers or renewals unless requested by Medical Officer of Health. Reactive, digressive in nature.	Progressive, pro-active approach to screening of food handlers and issuance of "health certificates". Screens for Tuberculosis, Typhoid Fever, Hepatitis B., HIV for all food handlers.		Health Protection & Promotion Act Food Premises Regulation R.R.O. 1990.
Gender Equality and Opportunity	Gender Gap Index (Appendix 1) ranking out of 128 participating countries in 2007 - 18th out of 128	Gender Gap Index ranking out of 128 participating countries in 2007 - 109th out of 128	OPPORTUNITY / WEAKNESS	World Economic Forum, 2007

8.0 Summary & Recommendations

The State of Qatar continues to realize exceptional economic prosperity and economic growth. One of the many challenges is to develop its government infrastructure to provide for preventive population based approaches to balance current and future population growth estimates. As the population increases there will be a demand for public food service retail outlets and a growing demand for takeaway food service. The challenging task for food safety professionals in the program planning and policy development areas is to determine the estimated burden of illness associated with foodborne illness and its impact on public health from a holistic viewpoint. This is important to provide the rationale to the respective funding agencies to legitimize food safety interventions at the government level. Using the Canadian estimate as a starting point, the burden of illness yearly in the State of Qatar calculated on a population base of 1.035 million persons and an incidence rate estimate of 25%; there will be approximately 258,750 persons who will become ill this year as a result of ingesting contaminated food either prepared in one's own home or from food originating from the public food service sector in the State of Qatar. This data should provide the rationale to begin to organize, plan and develop sustainable policy to more vigorously protect the retail food supply from foodborne disease contaminants. Good paragraph

The table described below provides a summary of recommended action items the State of Qatar should consider to assist with enhancing the food safety system.

1. Identification and risk categorization of all public retail food establishments
2. Development of roles and responsibilities of Ministry of Municipal Affairs and Agriculture and National Health Authority
3. Enhanced mandatory screening of all food handlers

4. Mandatory food handler certification
5. Customized inspection/investigation and surveillance software
6. Professional development of physicians
7. Modernization and accreditation of Central Laboratory
8. Comprehensive public health statute
9. Food safety policy and procedure manual
10. Human resource capacity
11. Development and implementation of train the trainer program
12. Sustainable public health funding

Each action item has the ability to be measured to determine the effectiveness of the implementation strategy over a specified time frame. The time frames have been expressed in terms of short, medium or long term goals which are based on recommended priority items identified through this examination of the food safety system in the State of Qatar in this project paper. Short term program goals will be those areas identified as being of priority to the State of Qatar in achieving its national food safety goal with an estimated implementation time frame of less than one year and are usually strategies which affect learning behaviours. Medium term program goals will be those areas of retail food safety which impact behaviour, practice or decisions in the State of Qatar that have an estimated time frame for implementation of between one to two years; while long term goals are those national program goal strategies identified with social, and economic consequences that have a time frame for implementation of between two and five years.

Table 8.1 Illustrating the Recommended Framework for Implementation of a Comprehensive Food Safety Action Plan in the State of Qatar

Program Input	Description and Action Strategies	Goal Setting Time Frame for Implementation
Identification and Risk Categorization of all Public Retail Food Establishments	<p>Mobilization of all staff at the MMAG to identify the location of all public retail food establishments and identify their location by Geographical Information System (GIS).</p> <p>Risk based inspections to categorize the establishment as either high, medium or low risk based on HACCP.</p> <p>Mandatory requirement to have business license department of MMAG liase with food inspection department to ensure all new food establishments are identified and GIS tracked prior to opening for business.</p>	Short Term Goal
Delineation of Roles and Responsibilities of MMAG and NHA	<p>Focus Group meetings to identify current roles and responsibilities pertaining to food safety inspection, investigation, disease surveillance and reporting methods between NHA and MMAG .</p> <p>Identify role of MMAG as sole provider of food inspection, recall procedures, complaint inspections and enforcement of law, health promotion activities for all retail food establishments.</p> <p>Identify role of the NHA as sole provider of outbreak investigations in the State of Qatar pertaining to food/water and the remainder of the 65 reportable diseases.</p> <p>Develop a Memorandum of Understanding between NHA and MMAG to identify roles and responsibilities.</p>	Medium Term Goal
Enhanced Mandatory Health Screening of all Food Handlers	<p>All food handlers (symptomatic or asymptomatic) in the State of Qatar must undergo medical examination to screen for <i>Staphylococcus spp.</i>, <i>Giardia</i>, <i>E. coli spp.</i>, <i>Campylobacter spp.</i>, <i>Shigella spp.</i>, Tuberculosis.</p> <p>Vaccine administered to all food handlers before working in the retail food service sector-Hepatitis A & B.</p> <p>All food handlers must undergo routine health screening on a yearly basis for renewal of health certificate to work as a food handler in the State of Qatar.</p>	Medium Term Goal
Mandatory Food Handler Certification	<p>All persons working in the retail food sector must hold current certification in basic food handling as outlined by the MMAG and its food safety regulations. Implementation of standard based on risk assessment protocols for high and medium risk facilities only. Those employed in high risk establishment must be certified before medium risk premises.</p>	Long Term Goal
Customized Inspection/Investigation and Surveillance Software	<p>Development and implementation of inspection software covering all aspects of food inspection, disease reporting, outbreak investigation, laboratory analysis.</p> <p>Integrated approach to food safety utilized by MMAG, NHA and the Central Laboratory for rapid reporting.</p> <p>Shared network service for sharing of laboratory data, food safety inspection records, disease surveillance records</p>	Medium Term Goal
Professional Development of Physicians	<p>Development of brochure document to be distributed to all diagnostic physicians in the State of Qatar to provide concise and practical information on the diagnosis, treatment and reporting of all major foodborne disease pathogens.</p> <p>Follow-up survey developed and distributed to all diagnostic physicians to determine levels of knowledge and behaviours.</p> <p>Managed and organized by Communicable Disease Department Head at the Health Authority</p>	Short Term Goal

Table 8.1 (continued) Illustrating the Recommended Framework for Implementation of a Comprehensive Food Safety Action Plan in the State of Qatar

Program Input	Description and Action Strategies	Goal Setting Time Frame for Implementation
Modernization and Accreditation of Central Laboratory	<p>Development and establishment of established standard methods for all laboratory analyses.</p> <p>Accredited laboratory credentialing-staff training, credentials, standard equipment and testing.</p> <p>International Organization for Standardization Credentialing for the laboratory facility.</p>	Long Term Goal
Comprehensive Public Health Statute	<p>Development of National Public Health Act and regulations there under.</p> <p>Development of Food Safety Regulation with enforcement and health promotion focus under the authority of the Public Health Act.</p> <p>Regulation based on risk based approaches based on HACCP principles.</p>	Medium Term Goal
Food Safety Policy and Procedure Manual	<p>Development of comprehensive policy and procedure manual outlining methods of inspection, enforcement, health promotion activities, risk based practices specific to retail food inspection practices for all MMAG inspectors.</p> <p>Development of job description for all food safety inspectors working in enforcement and/or health promotion functions</p>	Short Term Goal
Human Resource Capacity	<p>Sustainable funding to continue offering Qatari nationals scholarships to attend the College of North Atlantic in Qatar in Food Safety & Inspection or Environmental Health with guaranteed career positions upon graduation.</p> <p>Sustainable funding to offer non-national students scholarships to attend the College of North Atlantic in Qatar where a shortfall of Nationals enrolled has been identified.</p> <p>Continued opportunities for skilled expatriate food safety professionals to work as department heads with the NHA or MMAG where a shortfall of skilled Qatari national department heads has been identified.</p>	Long Term Goal
Development and Implementation of 'Train the Trainer' program	<p>The College of North Atlantic in Qatar to complete the development of training modules in environmental health competencies including food safety modules.</p> <p>Delivery of 'train the trainer' program to identified nursing educators at the National Health Authority.</p> <p>Delivery of Arabic translated training modules to identified environmental health inspectors by nursing educators at the National Health Authority.</p>	Medium Term Goal
Sustainable Public Health Funding	<p>Match or exceed per capita spending on public health spending in the State of Qatar as a comparison to Canada and its spending models.</p>	Short, Medium and Long Term Goals

9.0 Appendix 1

KEY TERMS

Bedouin -A desert dwelling Arab nomadic group.

Capacity Building - A World Health Organization responsibility with respect to strengthening national food safety programs in developing countries. It is a process to address gaps/needs and deficiencies in national food safety programs; identifying deficiencies and supporting food safety initiatives through advocacy, technical collaboration and human resource development.

Certified Public Health Inspector - Professional standard by which practicing environmental health officers/public health inspectors must obtain before being employed for a government health authority in Canada. Synonymous with Environmental Health Officer or Public Health Inspector or Food Safety Inspector.

Codex Alimentarius Commission - Created through a joint effort with the World Health Organization/Food and Agriculture Organization of the United Nations its purposes of the program are protecting health of the consumers and ensuring fair trade practices in the food trade, and promoting coordination of all food standards work undertaken by international governmental and non-governmental organizations.

Codex Member -As a nation, belonging to the Codex Alimentarius Commission.

College of North Atlantic - QATAR-Qatar's technical college which opened in September 2002 through an agreement between the State of Qatar and the College of Qatar-Newfoundland offering a Canadian curriculum in Health Sciences, Information Technology, Engineering Technology, Business Studies, Technical Trades and Continuing Education.

Determinants of health - the economic and social conditions under which people live which determine their health. The social determinants have been recognized by the World Health Organization as important factors in overall health.

Farm to Fork - relating to the human food chain, from production to consumption. The delivery of a food safety program from the farm to consumer end use. (Davidson, 1989)

Food and Agriculture Organization of the United Nations(FAO) -A United Nations body which collaborates with the World Health Organization to serve both the developed and developing countries to improve agriculture practices, forestry, fishing practices and ensure good nutrition and food safety for all.

Food Continuum - relating to the human food chain, from production to consumption. Synonymous with farm to fork.

Food Establishment - any food retail outlet in the State of Qatar where food is intended for consumption to the public (i.e. cafeterias, juice stalls, restaurants, schools, canteens, caterers).

Foodborne Illness- Foodborne illnesses are defined as diseases, usually either infectious or toxic in nature, caused by agents that enter the body through the ingestion of food. Every person is at risk of foodborne illness.

Food Inspection - Food inspection is an essential service to support the administration and implementation of food legislation: Primary functions provide for the services of inspection based programs of retail premises and processes; evaluating and controlling for hazards identified in food; documenting noncompliance with existing food law; encouraging voluntary compliance with legislation; education and training.

Food Safety - the delivery of a food inspection program to reduce foodborne illness in the population. Synonymous with food safety system.

Gender Gap Index - A report by the World Economic Forum which examines four critical areas of inequality between men and women: economic participation and opportunity, educational attainment, political empowerment, outcomes on representation in decision making structures health and survival, outcomes on life expectancy and sex ratio

Gulf Cooperation Council - the cooperation council for the Arab States of the Persian Gulf comprised of the following member countries: The United Arab Emirates, Bahrain, Kuwait, Qatar, Saudi Arabia, and Oman.

Hamad Medical Corporation (HMC) - the main general public medical institution under the auspices of the National Health Authority in the State of Qatar.

Hazard Analysis Critical Control Point (HACCP) - The universally recognized and accepted method for food safety assurance identified by the World Health Organization which addresses a systematic preventive approach to food safety that addresses physical, chemical, biological hazards as a means of prevention of foodborne illness.

Health Certificate - a current certificate that all persons employed in the food service sector as food handlers in the State of Qatar must hold. Food service employees are screened for communicable diseases of Hepatitis B, Human Immunodeficiency Virus (H.I.V.), Tuberculosis, and Salmonella Typhoid prior to employment in the food service sector.

Health Information Computer System (HCIS) - A means of generating a network of food safety and food inspection health data that can be shared amongst shareholders in the State of Qatar.

International Organization for Standardization -An international standard setting body comprised of various national standard organizations from 157 member countries. As an

example ISO standard 22000: 2005 Food Safety Management Systems is used as a tool in the food industry.

Medical Commission - a directorate of the National Health Authority responsible for the issuance of health certificates to of all expatriates inclusive of food handlers in the State of Qatar

Ministry of Municipal Affairs and Agriculture -a government agency responsible for the coordination, program development, inspection and enforcement of food establishments in the State of Qatar. Its delivery is carried out by ten municipalities throughout the State of Qatar.

National Health Authority - the public health care and preventive health system in the State of Qatar. Preventive Health directorates are as follows: Port and Food Control, Occupational Health, Communicable Disease, Non-Communicable Disease, National Laboratory, Vital Statistics, Environment Health, Health Education. The Health Care system is administered by Hamad Medical Corporation (HMC).

Ministry of Public Health - the public health care and preventive health system in the State of Qatar up until 2005.

Outbreak - A rate of foodborne illness above the expected rate for that place and time, where spread is occurring through cross infection, or person-to-person transmission.

Qatar Foundation - a private, chartered, not for profit organization founded by the Emir of Qatar in 1995 which has a network of progressive educational and research centers in the State of Qatar.

Qatarize - a regulatory process prescribed in Qatari law in which the private and public work sector in the State of Qatar must replace specified portions of their expatriate workforce with Qatari nationals within a prescribed time period.

Qatari Rial - the currency of Qatar. It is fixed with the U.S. dollar; 3.63 Qatari Riyals is equivalent to 1 U.S. dollar.

Retail Food - any food premise where meals or meal portions are prepared for immediate consumption or sold or served in a form that will permit immediate consumption on the premises or elsewhere. Retail food in the State of Qatar is food originating from public domains such as cafeterias, juice stalls, restaurants, hotels, food stores, caterers, food take-outs.

Sharia Law - the body of Islamic religious law governing personal matters in the State of Qatar

Sponsorship - In order for non-nationals to reside and work in the State of Qatar legally they must work under the authority of a Qatari national.

Surveillance - the ongoing collection, analysis and dissemination of food safety data not limited to any of the following activities- food inspection, investigation and tracking of foodborne illness

that is reported to health authorities that does not depend on active participation by responsible health authority to seek out foodborne illness in the population. Synonymous with passive surveillance.

World Health Organization - The United Nations public health arm responsible for the delivery and assessment of health systems around the globe. The department of Food Safety, Zoonoses and Foodborne Disease strive to reduce the serious impact of foodborne illness worldwide.

10.0 Appendix 2

Interview Guideline

Food Law and Regulations

- What enforcement powers do current public health inspectors have in enforcing Qatari food law?
- How are the National Health Authority and Ministry of Municipal Affairs and Agriculture collaborating or dividing up their powers pertaining to food safety inspection?
- What regulatory approach is taken to track, monitor and inspect food establishments in the State of Qatar?
- How is the mandatory reportable disease regulation utilized in capturing health data pertaining to foodborne illness in the State of Qatar?
- Are there exemptions to food law inspection or any gaps that you see in the food inspection process of food retailers?

Food Safety Management

- How is the reporting of disease coordinated between Hamad Medical Corporation and the National Health Authority?
- How does the Ministry of Municipal Affairs and Agriculture coordinate the inspection of food premises within its ten municipalities found in the State of Qatar?
- What job descriptions or policies does the Ministry provide for food safety inspectors?
- What food safety policies/procedures are in place with respect to the response to potential national or global food safety emergencies?

- What restrictions if any are there for females employed as food safety inspectors in the State of Qatar?

Inspection Services

- What HACCP based approaches are taken by food safety inspectors conducting health inspections working in the State of Qatar?
- What HACCP based approaches are food safety inspectors utilizing with respect to enforcement of the law?
- Are all public food retail establishments subject to government inspection?
- How many public health inspectors/food safety inspectors are employed by the National Health Authority categorized by qualifications and nationality?
- What procedures/protocols are in place to sample food materials in the State of Qatar for potential harmful microbiological contaminants?

Laboratory Services

- Are the facilities adequate for physical, microbiological and chemical analyses of retail food?
- Is the laboratory accredited by an international body?
- What international standard does the laboratory use to compare microbiological testing results of food samples for safety?
- What are the qualifications of the laboratory staff working in food safety quality control?
- How is the Central Laboratory integrated into the national food safety system?
- What procedures are in place to ensure the quality of samples received are representative of the food material they originate from?

- Is it the mandate for the laboratory to issue certificates for specific food types that enter the country through the air, land and sea ports?
- What is the National Health Authority "Train the Trainer" program and how is it to be delivered?
- What professional development opportunities are available for existing public health inspectors at the National Health Authority?
- What do you see as barriers in building and maintaining human resources at the National Health Authority?
- How are new graduates of food safety or environmental health integrated into the workforce at the National Health Authority?
- What are some barriers to building and maintaining a sustainable workforce?

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