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Chapter 3 - A Science-Based Approach to Food Safety

3.1 Introduction

Food safety is by no means solely an Ontario or even a Canadian issue. It is a subject that has received and continues to receive much study and debate worldwide. In developing a first class science-based food safety system for Ontario, there is no need to undertake extensive new scientific study on many issues as much research has already been done. There can be no dispute that the people of Ontario are entitled to the benefit of a food safety system which is science-based to ensure that it will produce food that is wholesome and safe to consume.

The term “science-based” is used to describe a number of “science” features. As this chapter illustrates, food hazards in meat and poultry arise from biological, chemical and physical hazards. Many of these hazards cannot be seen by the naked eye. Therefore, understanding the “science of biology”, the conditions that promote the growth of microorganisms, and the spread of animal disease helps us to predict where problems may arise and what measures can be taken to prevent them or reduce their impact. Understanding the “science of chemistry”, particularly how chemicals such as drugs and feed are processed and metabolized in an animal’s body, helps us to predict the point in time at which there should be no unsafe residues. Even with respect to physical hazards, science has a role in their avoidance, detection and elimination from our food.

There are a number of benefits to a science-based approach. Science is not just about what we know about a problem; it is also a way of approaching problems. It involves making observations and making and testing predictions. It tries to make a causal link. A science-based regulatory system contains rules that have been chosen because there is evidence that by following them, safer food will result. Because science-based approaches can be measured, they can be used to develop universally accepted food safety standards.

Science also helps us evaluate whether our food safety objectives are being met. Baseline studies, microbial performance standards and other testing can help determine whether reductions in foodborne pathogens are being

achieved. The science of epidemiology helps analyze foodborne diseases in humans, to determine whether food safety efforts result in less illness. Scientific research often results in new technology and innovation.

In developing a public policy framework for a food safety program, it is expected that the best available scientific knowledge and technology will be used to identify and characterize the food safety risks and the options to reduce them. While science is an important element in developing food safety policy it is not the only consideration. Social values, ethics, consumer demands, economic and political considerations and other factors will impact these policy decisions.¹

Many international organizations have developed and adopted rules and procedures with respect to food safety including meat hygiene. International bodies including the Food and Agricultural Organization of the United Nations (FAO), the World Health Organization (WHO), the International Office of Epizootics (OIE), and the World Trade Organization (WTO) have played a leading role in developing science-based standards governing food products. These standards were created to facilitate the implementation and harmonization of international standards to protect the health of consumers and to facilitate safe international trade of food products.

The development, implementation and operation of an effective science-based food safety program is complex. First, a good science-based food safety system must cross all aspects of the food production continuum from primary production to the consumer. Hence, the use of such descriptive phrases as “farm to fork”, “farm to table”, “farm gate to food plate” and others. Secondly, a good science-based food safety system relies upon the participation of all of the key stakeholders including governments, primary and secondary producers, retailers and consumers.

In the last ten years, there has been extensive progress in the development and implementation of food safety programs worldwide. Many programs have been voluntarily implemented by industry. Industry organizations have played a leading role in their development in Canada and elsewhere.

¹ *Report of the Expert Advisory Panel, The Scientific and Regulatory Basis of Meat Inspection in Ontario* (May 2004), p. 93 [hereinafter *Expert Advisory Panel Report*].

Increasingly, food safety programs are being developed and implemented by governments, often with industry support. Most government programs are voluntary, however, many are becoming mandatory.

The purpose of this chapter is to outline the key issues related to the science of food safety (focusing on meat), to outline the fundamentals of a good science-based food safety system, and outline the steps that have been taken to implement such systems across Canada, in Ontario, and in some other jurisdictions. I will make recommendations which, in my view, will ensure the safety of meat in Ontario.

3.2 Fundamental Principles of Meat Safety

In designing a science-based food safety system for Ontario, it is important to identify the key underlying principles and goals that should guide it. To find these fundamental principles, we need not look much further than the Codex Alimentarius Commission (CAC). The Codex Alimentarius (Codex) (which means “food code” or “food law”) is a set of food standards and codes of practices developed by consensus of CAC members, including Canada. Codex standards, guidelines and recommendations are designed to ensure that food products are not harmful to the consumer and can be traded safely between countries.

The relevant Codex general principles of meat hygiene (meat safety) may be summarized as follows:

- meat must be safe and suitable for human consumption with government, industry and consumers all having a role in achieving this outcome;²
- governments must establish regulatory meat hygiene requirements, must enforce them and verify compliance. It is the responsibility of the operator to produce meat that is safe and suitable in accordance with these regulatory meat hygiene requirements;

² Specific meat hygiene requirements should address biological, chemical and physical hazards; and pathophysiological and other characteristics associated with suitability for human consumption. Codex Alimentarius Commission, *General Principles of Meat Hygiene*, CAC/GL-52 (2003).

- meat hygiene programs should have, as a primary goal, the protection of public health and should be based on scientific evaluation of meat-borne risks to human health and take into account all relevant food safety hazards identified by research, monitoring, surveillance and other activities;
- the principles of food safety risk analysis should be incorporated into the design and implementation of meat hygiene programs;
- governments should formulate food safety objectives (FSOs) according to a risk-based approach so as to objectively measure the level of hazard control that is required to meet public health goals;
- meat hygiene requirements should control hazards to the greatest extent practicable throughout the entire food chain;
- HACCP principles (to be defined later in this chapter) should be applied in the design and implementation of meat hygiene measures throughout the entire food chain;
- governments should define the role of all personnel involved in meat hygiene activities including veterinarians, inspectors and operators;
- all those responsible for meat hygiene should carry out their activities with the appropriate training, knowledge, skills and ability;
- governments should verify that all establishments have adequate systems in place to trace and recall meat from the food chain;
- communication with consumers and other interested parties is important and should be undertaken where appropriate;
- the monitoring and surveillance of animal and human populations should be undertaken and the results used to review and/or modify meat hygiene requirements whenever necessary; and
- governments should recognize the equivalence of alternative hygiene measures where appropriate and promulgate meat hygiene measures that achieve required outcomes in terms of safety and suitability.

These principles provide a solid foundation for meat hygiene and apply across the food continuum from primary production through to consumption. I believe these principles must form part of the foundation of a good science-based food safety system for Ontario.

3.3 The Role of Government in a Science-Based Food Safety System

Without question, governments play an important role in a science-based food safety system including by:

- protecting public health by reducing the risk of foodborne illness;
- protecting consumers from unsanitary, unwholesome, mislabelled or adulterated food;
- providing assurance that food is suitable for human consumption;
- contributing to economic development by maintaining consumer confidence in the food system and providing a sound regulatory foundation for domestic and international trade in food; and
- providing health education programs to effectively communicate the principles of food hygiene to industry and consumers.³

A food safety system requires scientifically sound, achievable and enforceable laws and regulations that ensure food safety. Laws and regulations addressing food safety should contain the following elements:

- provide a high level of health protection;
- clear definitions to increase consistency and compliance;
- be based on high quality, transparent, independent scientific advice following risk assessment, risk management and risk communication;

³ FAO & WHO, *Assuring Food Safety and Quality: Guidelines for strengthening national food control systems* (2003), p. 6; Codex Alimentarius Commission, *Recommended International Code of Practice – General Principles of Food Hygiene*, CAC/RCP 1-1969, Rev. 3 (1997), Amd. (1999).

- provisions to take proactive preventative steps where an unacceptable level of risk to health has been identified even where a full risk assessment cannot be performed;
- provisions for the right of consumers to have access to accurate and sufficient information;
- provide for the tracing of food products;
- provisions indicating the primary responsibility for food safety and quality rests with producers and processors;
- an obligation to ensure that only safe and fairly presented food is placed on the market;
- measures to ensure compliance and enable enforcement; and
- where food is to be shipped outside of Canada, recognize the associated international obligations.⁴

3.4 Risk Analysis in the Development of Public Policy

Public policy is developed through a process of risk analysis. Risk analysis is a process that includes risk assessment, risk management and risk communication.⁵ It is now well accepted that these three components of risk analysis cannot be separated, but rather are integrated and that communication involves the multi-directional flow of information.⁶

3.4.1 Risk Assessment

In respect of foodborne illness, risk is a measure of the probability that a certain adverse health effect will occur as a result of a food hazard and the severity of that effect. A risk assessment may be defined as the use of scientific data to identify, characterize and measure hazards, assess exposure, and characterize the risk involved with a particular food product.⁷

⁴ FAO & WHO, *Assuring Food Safety and Quality*, supra note 3, p. 61.

⁵ *Expert Advisory Panel Report*, supra note 1, p. 89-96; Codex Alimentarius Commission, *Draft Principles for the Risk Analysis of Foods Derived from Modern Technology*, available from http://www.codexalimentarius.net/biotech/en/ra_fbt.htm [accessed 17 May 2004]

⁶ D. Powell et al., *The impact of media on public perception and policy development related to meat inspection in Ontario* (June 2004). This report was prepared by members of the Department of Agriculture, University of Guelph at my request.

⁷ Institute of Food Technologists, *Expert Report on Emerging Microbiological Food Safety Issues: Implications for Control in the 21st Century* (Released 20 February 2002), p. 67; Codex Alimentarius Commission, *Draft Principles for the Risk Analysis of Foods Derived from Modern Technology*, supra note 5.

The questions that should be asked include: What can go wrong? How likely is a bad outcome? When will it occur? What is the likely significance of the loss?⁸ Typically, risk assessment models seek to use available scientific data to determine, in either a qualitative or quantitative manner, the probability or impact of the adverse health effect occurring. While quantitative risk assessments are preferable, they can only be done if the necessary expertise, time, data and methodology are available. For that reason, a strong investigative research and surveillance infrastructure is needed to support the risk assessment process. In dealing with meat safety, two necessary components are foodborne disease surveillance and baseline studies of hazards in foods.⁹

3.4.2 Risk Management

Risk management is defined in the Codex as the process of weighing policy alternatives in light of the results of risk assessment and, as required, selecting and implementing appropriate control options including regulatory measures.¹⁰

3.4.3 Risk Communication

Risk communication is the part of risk analysis that involves the exchange of information and opinions, concerns, risk and risk-related factors designed to lead to a better decision-making process.¹¹ It is a form of consultation that allows stakeholders an opportunity to become informed and provide input and critical review. It also involves the communication of a policy decision to those who will be affected by it. Risk communication is an important factor in achieving stakeholder acceptance and compliance with the ultimate policy decision.¹² Failure to undertake proper risk

⁸ Codex Alimentarius Commission, *General Principles of Meat Hygiene*, *supra* note 2.

⁹ *Expert Advisory Panel Report*, *supra* note 1, p. 91.

¹⁰ Codex Alimentarius Commission, *Principles and Guidelines for the Conduct of Microbiological Risk Assessment*, CAC/GL-30 (1999); Codex Alimentarius Commission, *Draft Principles for the Risk Analysis of Foods Derived from Modern Technology*, *supra* note 5.

¹¹ *Ibid.*

¹² *Expert Advisory Panel Report*, *supra* note 1, p. 92.

communication can defeat the most well-intentioned and well-crafted policies and programs.¹³

3.4.4 What is an Appropriate Level of Risk?

In dealing with food safety, we would all hope for the absolute elimination of all food hazards and, absent other considerations, advocate a policy of zero tolerance. Realistically, zero tolerance with the meaning of complete removal of all hazards is not achievable or affordable. Consumers of meat are likely prepared to accept a certain level of risk, but there is a level beyond which they will not go. This concept of acceptable risk is not purely scientific and involves consideration of other factors including societal values and, most often, the availability of resources. It falls to our policy makers to determine what level of risk the public will accept and how much the public is prepared to pay to achieve it. As I indicated in the introduction to this Report, the goal is to develop a meat safety policy that will ensure the level of risk associated with consuming meat in Ontario is so negligible that a reasonable and informed person will feel safe eating it.

After completing a risk assessment and a risk management analysis, governments responsible for food safety need to establish FSOs. These FSOs define specific values or targets to be used in achieving the public health goals by regulators and industry.

3.4.5 Ontario's Food Safety Vision, Goals and Objectives

The provincial government, through the Ontario Ministry of Agriculture and Food's (OMAF) Food Industry Division, has publicly declared its vision and mission, core strategies and guiding principles in respect of food safety. Its vision is that of "*Ontario's food industry – an innovative, responsive world leader providing safe, superior value products.*" Its declared mission is to "*provide leadership, support and a regulatory framework that assures Ontario consumers a safe food supply and promotes growth and competitiveness of our food industry.*" Out of three core strategies one

¹³ *Ibid.*, p. 129.

relates to food safety, namely, “to minimize the risk to the public from foodborne illness.”¹⁴

OMAF’s stated goals to achieve this core strategy are as follows:

- develop risk-based food safety standards and regulatory programs that provide, at minimum, the same level of protection as federal standards for those commodities specified under provincial legislation and regulations;
- ensure the delivery of food safety regulatory programs with an emphasis on increasing industry accountability;
- ensure the development and delivery of education and communication programs to increase understanding and management of the risk of foodborne illness;
- coordinate with federal, provincial and municipal authorities to ensure a seamless food safety system; and
- develop and maintain the ability to deal with high priority food safety issues/emergencies.

There can be little dispute with the general language stated in these public statements of OMAF’s vision, strategy and goals. What is absent, however, are specific strategies, business plans and FSOs that identify how the province intends to accomplish its overall strategy.

The last business plan released by OMAF was for 2002 – 2003 and it contained very little in respect of food safety.¹⁵ Under the business plan, OMAF was to develop and introduce regulations under the *Food Safety and Quality Act, 2001 (FSQA)*¹⁶ to strengthen Ontario’s food safety system and to work with industry to improve compliance with safety standards. Of ten

¹⁴ The other two core strategies are to enhance domestic and global market penetration of Ontario grown/processed agri-foods and to increase attraction and retention of investment in the agri-food sector.

¹⁵ OMAF, *Business Plan 2002-2003*, available from <http://www.gov.on.ca/OMAFRA/english/about/BusPlan2003/index.html> [accessed 6 June 2004].

¹⁶ *Food Safety and Quality Act, 2001*, S.O. 2001, c. 20, received royal assent December 5, 2001 but not yet proclaimed.

key performance measures, only two related to food safety. Overall food safety does not appear to be a significant priority within the business plan.

What is strikingly absent in Ontario is a clearly articulated, transparent and well-defined strategy for the province that publicly outlines the government's plans, strategies and objectives for food safety and the reduction of foodborne illness.

In October 2000, the provincial government approved the Ontario Food Safety Strategy (OFSS). OFSS is described by OMAF as an ongoing process to improve Ontario's food safety system by enhancing government's capacity to protect public health, address gaps in the food inspection system and increase the marketability of Ontario's food products. The OFSS vision was to create a science-based system that links the food chain from "field-to-fork". OFSS was developed to be a partnership between government ministries, local health boards and federal authorities. Ontario has spent in excess of \$50 million on OFSS initiatives since 2000, yet there has been no public reporting on these initiatives and their measure of success.

OMAF advised the Review that under OFSS, improvements have been made in three strategic areas namely, science and analysis, field operations and strategic development and coordination.¹⁷

OMAF's ability to communicate its strategies and objectives may have been hampered by the delay in proclamation of the *FSQA* and the enactment of new regulations. Policy and strategy cannot be publicly communicated or implemented until the underlying policy decisions are made and the government commits to making the necessary resources available.

The provincial government has a significant responsibility for the safety of meat and other food in Ontario. There is a corresponding public interest in the safety of the food produced and consumed in Ontario. There needs to be

¹⁷ Science and analysis initiatives include baseline microbiological studies, funding for food safety research projects, scientific support enhancements of the food inspection program and food safety database development. Field operation improvements include strengthening of compliance, enforcements, monitoring of deadstock/rendering industry and development of the HACCP Advantage Program. Strategic development and coordination improvements include strategic initiatives related to the development of regulations under the *FSQA* and inter-agency coordination.

open and regular reporting by the provincial government to the people of Ontario.

The United States Department of Agriculture (USDA) is required by law to deliver annual performance reports to Congress and to the American people setting out:

- its strategic plan that depicts long-term goals and strategies;
- its annual performance plan that outlines year-to-year strategies and targets for achieving its long-term goals; and
- a performance and accountability report that shows how well it did in reaching the goals established in the previous fiscal year.¹⁸

Similarly, the Food Safety Inspection Service (FSIS) in the U.S. delivers annual program performance reports that describe its specific strategic goals and objectives, strategies and outcomes.

In Canada, the Food Directorate¹⁹ delivered its first report in 2001 on the science and research activities of the branch. The comprehensive report set out detailed descriptions of the mandates, missions, roles and responsibilities of the branch together with detail of the laboratory and non-laboratory based science being undertaken. In addition, the Food Directorate also recently delivered its first annual report on program priorities and achievements.²⁰ This report set out six key strategies and described the work of the directorate with a detailed list of prioritized projects in the areas of policy/regulatory development, evaluation and risk benefit analysis, intelligence (research and surveillance) and health outcomes. For each priority, there is a description of the activity and projects including milestones for completion. The report also lists the achievements in the past year and provides a public accounting of the Food Directorate's work.

¹⁸ USDA, *Performance and Accountability Report for FY 2003*, available from <http://www.usda.gov/ocfo/usdarpt/usdarpt.htm> [accessed 2 June 2004].

¹⁹ The Food Directorate is part of Health Canada's Health Products and Food Branch and has primary responsibility of establishing policies and standards related to food safety and nutrition.

²⁰ Health Canada, Food Directorate, *First Annual Report on Program Priorities & Achievements, 2003-2004* (December 2003), available from http://www.hc-sc.gc.ca/food-aliment/dg/e_rpt_priorities_achievements_dec_2003.pdf [accessed 6 June 2004].

The Canadian Food Inspection Agency (CFIA) is mandated by its enabling legislation to deliver an annual report outlining its activities and the results achieved.²¹ The Auditor General is required to include a summary statement assessing the fairness and reliability of the reported information.

The citizens of Ontario should expect similar reporting from the Government of Ontario.

I recommend that the provincial government publicly articulate its policy, targets and goals in respect of food safety including food safety objectives. The province should also develop and make public a business plan for its food safety initiatives with appropriate methods to measure the results and deliver an annual public report outlining its program priorities, strategies, objectives and achievements.

3.5 Foodborne Illnesses

Needless to say, the primary reason for having any food safety system is to ensure that the food consumed by the public is safe, in that it will not cause harm to health. The information which has been presented to me together with the advice of the Expert Advisory Panel leads me to conclude that the meat produced and consumed in Ontario is, for the most part, safe and free of hazardous contaminants.²² On the other hand, foodborne illness remains a significant public health issue in Ontario. Since we tend to think of foodborne illness as a problem in other parts of the world, many would be surprised at the prevalence of foodborne illness in North America.

The Expert Advisory Panel has, in its report, outlined the public health hazards associated with meat consumption and the trends in foodborne illness.²³ For the purposes of understanding the rationale for my recommendations, I provide an overview of these issues.

3.5.1 Prevalence of Foodborne Illness

It is difficult to measure the true extent of foodborne illnesses. Many ill persons do not seek medical attention for symptoms that may last no longer

²¹ *Canadian Food Inspection Agency Act*, S.C. 1997, c.6, s.23

²² *Expert Advisory Panel Report*, *supra* note 1, p. 33.

²³ *Ibid.*, Ch. 4.

than a day or two. Others seek medical attention, but are not tested and consequently, the foodborne illness goes undiagnosed. The Centers for Disease Control and Prevention (CDC) in the U.S. has concluded that there is substantial under reporting of foodborne illness. The CDC estimates for every case of *Salmonella*-related illness diagnosed and reported to public health authorities, 38 cases actually occurred.²⁴ An Ontario study estimates that only one in 17 illness caused by *Campylobacter*, *Salmonella* and *Yersinia* is reported and one in nine for *Shigella* illnesses.²⁵ In addition, many foodborne infections are not identified by routine laboratory procedures and require specialized equipment and testing that is generally not available. As a result, the data used to measure the prevalence of foodborne illness usually involves projections in respect of illnesses that are unreported or reported, but not attributed to the consumption of food.

The CDC estimates that foodborne diseases cause approximately 76 million illnesses, 323,000 hospitalizations and 5,200 deaths in the U.S. each year.²⁶ On a per capita basis, this would translate into approximately 3.2 million illnesses in Ontario annually (assuming common incidence rates).²⁷

In the United Kingdom (U.K.), the Food Standards Agency has reported that in 2000 there were over 65,000 reported cases of foodborne illness caused by five major pathogens.²⁸

In Canada, there is less reliable data measuring the true extent of foodborne illness. Although Canada has established surveillance programs for enteric disease, the accuracy of the data is limited by the nature of the reporting mechanisms. Health Canada is currently undertaking further studies to

²⁴ U.S., CDC, *Foodborne Illness – General Information*, available from http://www.cdc.gov/ncidod/dbmd/diseaseinfo/foodborneinfections_g.htm#mostcommon [accessed 2 June 2004].

²⁵ G. Campbell et al., OMAF, *Estimating the total health-related impact of foodborne illness in Ontario, using Monte Carlo simulation to characterize uncertainty* (4 November 2003).

²⁶ P. Mead et al., *Food-related Illness and Death in the United States*, *Emerging Infectious Diseases* (Vol. 5, No. 5, September – October 1999).

²⁷ Applied Research Consultants, OMAF, *Case Study Report: Economic Impacts of Proposed Ontario Food Safety System Initiatives* (4 March 2002).

²⁸ U.K., Food Standards Agency, *Measuring Foodborne Illness Levels* (18 April 2002), available from <http://www.foodstandards.gov.uk/science/sciencetopics/microbiology/58736> [accessed 2 June 2004].

provide a more accurate estimate of foodborne disease prevalence.²⁹ Health Canada estimates that over 30,000 cases of foodborne illnesses are reported in Canada, the majority of which are due to microbial contamination of raw foods of animal origin including meat, poultry, eggs, raw milk, cheese, fish and seafood.³⁰

In Ontario, there have been a number of studies of enteric illness based on actual reporting. One study showed that between 1992 and 1996, 56,690 reported cases of enteric disease related to eight pathogens.³¹ A more recent study reported that between 1997 and 2001, 44,451 cases of confirmed enteric disease were attributable to these eight pathogens. This data must be read carefully because enteric illness can also be due to many non-food related causes.³² To date, there has been limited surveillance and study to determine the true extent of foodborne illness in Ontario beyond what is reported. One recent Ontario government report estimates that there are over 305,573 cases of foodborne illness in Ontario each year based on a review of 16 pathogens of which approximately 20% or 61,000 are related to the consumption of meat and poultry products. While many foodborne illnesses result in only short-term discomfort without any permanent consequences, it is important to note that foodborne illness can and does result in serious permanent physical injury and even death, particularly in vulnerable groups such as young children and the elderly.³³

3.5.2 The Economic Costs of Foodborne Illness

In addition to the personal suffering of those who are afflicted with foodborne illness, there are significant economic costs. In the U.S., the cost

²⁹ Health Canada, National Studies on Acute Gastrointestinal Illness, *Background*, available from http://www.hc-sc.gc.ca/pphb-dgsp/psagi-enmga/info_e.html [accessed 29 April 2004].

³⁰ Health Canada, *Policy Development for Raw Foods of Animal Origin*, available from http://www.hc-sc.gc.ca/food-aliment/mh-dm/mhe-dme/rfao-aoca/e_rfao.html [accessed 7 June 2004].

³¹ Health Canada, *Distribution of Foodborne Disease by Risk Setting – Ontario*, Canada Communicable Disease Report (Vol. 24-8, 15 April 1998), available from <http://www.hc-sc.gc.ca/pphb-dgsp/publicat/ccdr-rmtc/98pdf/cdr2408e.pdf> [accessed 2 June 2004].

³² J. Lim & D. Middleton, MOHLTC, *Enteric Outbreaks Reported in Ontario, 2000-2002*, Public Health and Epidemiology Report Ontario (Vol. 14, No. 11, 31 December 2003), p. 202.

³³ American Medical Association et al., *Diagnosis and Management of Foodborne Illnesses: A Primer for Physicians and Other Health Care Professionals* (February 2004), p. 3, available from http://www.ama-assn.org/ama1/pub/upload/mm/36/2004_food_introclin.pdf [accessed 9 June 2004].

of human illness due to seven specific pathogens has been estimated to be in the range of \$6.5 billion to \$34.9 billion U.S. annually. In Australia, the cost of an estimated 11,500 cases of food poisoning per day was calculated at \$2.6 billion A.U.D. annually. In England and Wales, the medical costs and value attributed to lives lost from five specific foodborne infections were estimated at £300 - £700 million annually in 1996.³⁴

In 2002, OMAF estimated the economic impact of annual foodborne illness cases in Ontario. OMAF's analysis concluded that there are in excess of 2.5 million cases of foodborne illness in Ontario each year, requiring 9,319 annual hospitalizations and resulting in 135 deaths.³⁵ Based on this estimate, OMAF projected the annual economic impact arising from lost time, doctors' visits, hospitalizations, death and chronic sequelae amounts to be in excess of \$3.2 billion in Ontario. Health care is a responsibility of the provincial government and this amounts to a major financial burden which OMAF estimates to be approximately \$786 million per year.³⁶

OMAF estimates that 30% of these health-related costs, namely, \$207 million is attributable to meat-related illness.³⁷ OMAF believes that their estimates are very conservative and that the true costs are probably higher.

³⁴ FAO & WHO, *Assuring Food Safety and Quality*, supra note 3, p. 336; Codex Alimentarius Commission, *Recommended International Code of Practice – General Principles of Food Hygiene*, supra note 3; J. Buzby et al., USDA, *Bacterial Foodborne Disease: Medical Costs and Productivity Losses*, AER No. 741, (Washington: Economic Research Service, 1996); WHO, *World Health Statistics Quarterly*, Vol. 50, No. 1 & 2, (Geneva: WHO, 1997).

³⁵ G. Campbell, OMAF, *Estimated Annual Cases, Hospitalizations, and Mortality from Foodborne Diseases in Ontario and Resulting Economic Impact* (20 June 2002).

³⁶ *Ibid.*

³⁷ *Ibid.*

Estimated Annual Health-Related Costs, Cases and Deaths
 Resulting from Foodborne Illness in Ontario by Food Group
 Projected for the year 2002³⁸

Food Group	Cost	Percent Impact	Est. cases	Est. deaths	Average no. cases per outbreak*
Horticultural products, incl. Non-deli salad	\$146,812,323	18.7 %	86,853	7	41
Poultry	104,560,949	13.3 %	43,434	4	25
Beef	83,375,078	10.6 %	9,106	7	20
Deli salads	59,287,936	7.5 %	30,904	3	57
Ready to eat meats	57,732,165	7.4 %	19,105	4	32
Seafood	36,644,331	4.7 %	19,088	2	24
Egg/egg products	31,898,509	4.0 %	8,224	3	28
Dairy, excl. raw milk	27,983,415	3.6 %	13,145	2	54
Pork	13,182,801	1.7 %	5,354	1	51
Mixed/miscellaneous products	196,100,995	24.9 %	165,686	6	30
Other meats, non-RTE	12,012,312	1.5 %	5,245	1	27
Raw milk	16,860,654	2.1 %	4,195	1	10
Total	\$ 786,451,469	100.00 %			

Pathogens considered: Campylobacter spp., Salmonella spp., VTEC, Listeria monocytogenes, Bacillus cereus, Clostridium perfringens

Economic considerations: Lost time, doctors' visits, hospitalizations, deaths, chronic sequelae

*An "outbreak" is an incident in which two or more persons, in separate households, experience similar illness after common exposure.

3.5.3 Causes of Foodborne Illness

Foodborne illness is caused as a result of the consumption of or contact with food that has been contaminated with some type of microbiological, biological, chemical or physical hazard. Examples of these contaminants are listed in the chart below.

Types of Contaminants

Hazard	Example
Microbiological	Bacteria, viruses, prions, yeasts, moulds, parasites
Biological	Bone, hair, insects, faeces
Chemical	Pesticides, toxins, cleaning liquids, veterinary drug residues
Physical	Glass, metal, wood, string, dirt, etc.

³⁸ Ibid.

1.1.1 Meat as a Source of Microbiological and Biological Hazards

There are more than 250 different kinds of foodborne illnesses. Most foodborne illnesses are related to infections which are caused by a variety of bacteria, viruses and parasites. Meat can contain microbial agents that cause foodborne illness usually with initial symptoms of nausea, vomiting, abdominal cramps and diarrhea.

The most commonly recognized bacteria found in meat products are *Campylobacter*, *Salmonella*, and *E. coli* O157:H7. Other bacteria found in meat include *Bacillus cereus*, *Clostridium botulinum*, *Clostridium perfringens*, *Listeria monocytogenes*, *Shigella* spp, *Staphylococcus aureus* and *Vibrio vulnificus*.

Current knowledge suggests variant Creutzfeldt-Jacob Disease (vCJD) is a disease which can be transmitted to humans by consumption of beef containing abnormal proteins called prions. It is believed that prions which cause BSE in cattle are transmitted to the cattle through feed containing meat and bone meal manufactured from the rendering of BSE-infected cattle.³⁹ The current scientific evidence suggests that humans are at risk if they consume certain tissues from BSE infected cattle which are called specified risk materials (SRM). The SRM includes the skull, brain, trigeminal ganglia, eyes, tonsils, spinal cord and dorsal root ganglia of cattle aged 30 months or older, and the distal ileum of cattle of all ages.⁴⁰ It is important to note that vCJD is a fatal disease without a current known cure. Only one case of vCJD has been detected in Canada so far, although it is suspected that this person contracted the illness in the United Kingdom.⁴¹

3.5.4 Meat as a Source of Chemical and Physical Hazards

Chemical and physical hazards associated with meat products can also cause illness in humans. The chemical hazards include anti-microbial drug residues, hormone residues, environmental pollutants and pesticides, and processing-related contaminants. Potential contaminants are also in various

³⁹ Expert Advisory Panel Report, *supra* note 1, p. 42.

⁴⁰ *Ibid.*

⁴¹ G. Campbell, OMAF, *Estimated Annual Cases, Hospitalizations, and Mortality from Foodborne Diseases in Ontario and Resulting Economic Impact*, *supra* note 35.

food additives used as preservatives to improve appearance and flavour in processing. Additives such as sodium nitrate are particularly relevant in the safety of cured meats. The preparation of ready-to-eat meats which are ready to be consumed by the consumer after purchase are particularly high risk for microbial contaminants as well as processing-related contaminants.

Anti-microbial and anti-parasitic drug residues can contaminate meat where medications are administered to animals and there is a failure to observe the recommended drug withdrawal period prior to slaughter.⁴²

Like many other raw materials, meat products are exposed to physical contamination. For example, there is a risk of contamination by a broken needle used to administer medication to an animal at the farm. During slaughter through to processing, meat is exposed to various other potential external physical contaminants. The failure to detect and remove such contaminants can result in illness and injury to humans.

3.5.5 How Meat Becomes Contaminated

Meat can become contaminated in many different ways.⁴³ Microbial agents capable of infecting people and causing illness can occur naturally in the environment or in animals. Some of these agents can cause animals to become ill, whereas others can be found in healthy animals. Diseases which can be transmitted from animals to humans are called zoonotic diseases. Approximately one-half of known infectious microbial agents can be transmitted from animals to humans.⁴⁴ Of concern are new emerging infectious diseases, many of which are zoonotic, involving newly identified pathogens such as West Nile Virus, Avian Influenza and SARS.

Humans are also sources of infection. Transmission of microbial agents to meat products can easily occur if the food is contaminated by an infected food handler or through faulty food handling or improper hygiene. Appendix F provides a helpful summary of the biological, chemical and

⁴² *Expert Advisory Panel Report, supra* note 1, p. 49.

⁴³ Health Canada, The Steering Committee For Raw Foods Of Animal Origin, *Recommendations For The Development Of Policy Related To Raw Foods Of Animal Origin* (24 September 2001), available from http://www.hc-sc.gc.ca/food-aliment/mh-dm/mhe-dme/rfao-aoca/e_rfao_sept2101.html [accessed 2 June 2004].

⁴⁴ *Expert Advisory Panel Report, supra* note 1, p. 33.

physical hazards commonly associated with meat during the slaughter, processing, retail and food services stages and possible interventions.

3.5.6 Responsibility for Reduction of Foodborne Illness

Most foodborne illnesses from meat are related to pathogens and, as a result, often can be prevented with proper handling and processing and ultimately cooking the meat to a temperature that will kill the pathogens, but the onus should not be placed on the consumer alone. Effective food safety is a shared responsibility. A good food safety program by industry, an appropriate level of government inspection and enforcement throughout the farm to fork continuum, and responsible food preparation and handling by the consumer is the surest formula for reducing the risk of meat-related illness arising from the consumption of meat. Such a food safety system allows consumers to have confidence in the safety of the meat they consume.

3.6 Food Safety Programs and HACCP

Any discussion of a science-based food safety system must involve a discussion of the Hazard Analysis Critical Control Point system (HACCP). HACCP (pronounced Hassip) is widely recognized as the preferred method for assuring safety of our food including meat.⁴⁵

HACCP has become synonymous with food safety.⁴⁶ HACCP was developed approximately 45 years ago by the Pillsbury Company as part of its work with the U.S. Army and NASA in producing food products for use in the space program that were without defect and safe for consumption by astronauts. HACCP has been universally endorsed by international bodies including CAC, FAO, WHO, as well as many other national and international organizations, leading food safety scientists, governments and industry.

⁴⁵ M. Pierson, USDA, *An Overview of Hazard Analysis Critical Control Points (HACCP) and Its Application to Animal Production Food Safety*, Conference of Research Workers in Animal Diseases (12 November 1995), available from <http://www.cvm.uiuc.edu/HACCP/Symposium/PIERSON.HTM> [accessed 22 April 2004].

⁴⁶ FAO, *Food Quality and Safety Systems - A Training Manual on Food Hygiene and the Hazard Analysis and Critical Control Point (HACCP) System* (Rome: FAO, 1998), s. 3.

In 1993, HACCP was first recognized and adopted by CAC. The recommended International Code of Practice – General Principles of Food Hygiene adopted in June 1997 includes as its annex, the HACCP system and guidelines.⁴⁷ This is the standard against which all HACCP programs are measured.

HACCP is a science-based system that identifies specific hazards and measures for their control to ensure the safety of food. Two key elements of a HACCP system are that it is both preventative and systemic in approach. It is designed to address biological, chemical and physical hazards. The system is designed to detect potential hazards before they occur and to implement control measures to reduce or eliminate the likelihood of their occurrence. HACCP-based systems are important because, while meat inspection and testing is significant, there is no amount of inspection and/or testing that is capable of eliminating all hazards. We should not rely exclusively on government inspection and testing to ensure the safety of our meat. HACCP, together with a good inspection and testing system, form the core of any solid food safety system. Organoleptic inspection⁴⁸ is not enough. HACCP alone is not enough. Government organoleptic inspection and HACCP complement each other in a truly science-based approach to food safety.

⁴⁷ Codex Alimentarius Commission, *Recommended International Code of Practice – General Principles of Food Hygiene*, *supra* note 3. See Appendix E.

⁴⁸ Organoleptic relates to the senses (taste, colour, odour, feel). Organoleptic inspection involves an inspector visually examining, feeling and smelling animal parts to detect signs of disease or contamination.

3.6.1 HACCP Principles

HACCP's science-based, preventative and systematic approach to the identification, evaluation and control of food safety hazards is based on the following seven key principles:

- PRINCIPLE I: Conduct a hazard analysis. A hazard is defined as a biological, chemical or physical agent in, or a condition of food with the potential to cause an adverse health effect.
- PRINCIPLE II: Determine the Critical Control Points (CCPs). A CCP is a step at which a control can be applied. It is essential to prevent or eliminate a food safety hazard or reduce it to an acceptable level.
- PRINCIPLE III: Establish the critical limits.
- PRINCIPLE IV: Establish a system to monitor control of the CCP.
- PRINCIPLE V: Establish the corrective action to be taken when monitoring indicates that a particular CCP is not under control.
- PRINCIPLE VI: Establish procedures for verification to confirm the system is working effectively.
- PRINCIPLE VII: Establish documentation concerning all procedures and records appropriate to these principles and their application.⁴⁹

⁴⁹ Codex Alimentarius Commission, *Recommended International Code of Practice – General Principles of Food Hygiene*, *supra* note 3.

These seven HACCP principles are applied in a 12-step logical sequence as follows:

Step 1	Assemble a HACCP Team
Step 2	Describe the Product
Step 3	Identify its Intended Use
Step 4	Construct a Flow Diagram
Step 5	Conduct On-Site Confirmation of Flow Diagram
Step 6/Principle 1	Conduct a Hazard Analysis
Step 7/Principle 2	Determine the Critical Control Points (CCPs)
Step 8/Principle 3	Establish the Critical Limits
Step 9/Principle 4	Establish a System to Monitor Control of the CCPs
Step 10/Principle 5	Establish the Corrective Actions to be taken when monitoring indicates that a particular CCP is not under control
Step 11/Principle 6	Establish procedures for verification to confirm that the HACCP System is working effectively
Step 12/Principle 7	Establish documentation concerning all procedures and records appropriate to these principles and their application ⁵⁰

3.6.2 Conditions Precedent to a HACCP-Based Food Safety System

The seven HACCP principles and the twelve-step application process are not applied in a vacuum. A HACCP system assumes that there is an underlying foundation of prerequisite programs. Prerequisite programs establish the basic environmental and operating conditions necessary for the production of safe, wholesome food. Prerequisite programs cover the following areas: good hygienic practices (GHP); good manufacturing practices (GMP);⁵¹ shipping, receiving and storage; sanitation; equipment maintenance; pest control; recalls; and water safety. The scope and extent

⁵⁰ *Ibid.*

⁵¹ GHP/GMP are sometimes also described in HACCP plans as Good Agricultural Practices (GAPs) or Good Production Practices (GPPs). Generally, they describe a combination of practices and policies that are intended to promote good hygiene and the production of safe food.

of these prerequisite programs may vary depending on the activity undertaken. They are usually part of any meat regulation system.

Prerequisite programs are distinct from the HACCP plan and they need to be documented and regularly audited. An important part of the implementation of a HACCP plan is to confirm the existence and effectiveness of all prerequisite programs.

The successful application of HACCP requires the full commitment and involvement of management and the total workforce.⁵² Management must be educated as to the benefits of HACCP and why it must take a leadership role in implementing it. Management and all employees must be properly trained in the operation of the HACCP system and also in the importance of their role in the production of safe food. Specific training is required, particularly for each CCP with clear and understandable instructions and procedures outlining performance expectations.⁵³

The use of HACCP systems requires both government and the user to adopt a different approach to food safety. The traditional regulation and inspection system is based on the “command and control” model where there are rules of expected performance and then, inspection and testing to determine if these standards have been met. HACCP, on the other hand, is an outcome-based system that focuses on identification and prevention. While governments continue to inspect and monitor compliance with the regulated food safety standards, there is also the need under HACCP for governments to verify process control and pathogen reduction based on pre-determined standards. An important aspect of any mandatory HACCP system is an inspectorate who are knowledgeable and well-trained in the principles of HACCP and HACCP verification procedures.

3.6.3 HACCP Verification and Recognition

Verification and recognition are two important components of a successful HACCP system. It is important to ensure that each operator’s HACCP

⁵² *Expert Advisory Panel Report, supra* note 1, p. 11; USDA, National Advisory Committee on Microbiological Criteria for Foods, *Hazard Analysis and Critical Control Point Principles and Guidelines* (Adopted 14 August 1997), p. 6.

⁵³ *Ibid.*

program, including prerequisite programs, is in compliance with all HACCP and regulatory requirements. Having made a significant investment in time and resources to develop a HACCP system, operators desire formal government recognition of their certified or verified HACCP program. Formal verification and recognition by the government are important food safety measures, but also allow the producers to market themselves as approved HACCP facilities.

This verification/recognition process can be done in a number of different ways including government certification, third party certification or a combination of the two. Various methods have been used in other jurisdictions, however, most governments will somehow audit and recognize individual establishments.⁵⁴

Some jurisdictions have adopted a system of third party recognition.⁵⁵ If third party organizations are used for certification, they must be competent, impartial and have HACCP experience. Organizations such as the International Standards Organization (ISO), Standards Council of Canada (SCC) or Canadian General Standards Board (CGSB) are examples of organizations that undertake this type of activity. These third party organizations are involved in the audit and certification process, but also may have ongoing involvement such as conducting follow-up audits or review of documentation to verify the ongoing operation of the HACCP plan, or periodic re-certification.

Recognition and verification by government does not replace in any way the ongoing internal verification of the HACCP system by the operator. The operator must undertake a continual review of process control systems, including corrective and preventative actions to ensure that regulatory and/or specified requirements are met as part of the HACCP plan.

⁵⁴ This includes FSEP, QMP and FSIS (US) and many European member states.

⁵⁵ OMAF, *Hazard Analysis Critical Control Points (HACCP), Background Paper, Draft 1 (2001)*, p. 45.

3.6.4 Benefits and Barriers to HACCP

Consumers, industry and government all benefit from HACCP systems.

The benefits to consumers include:

- reduced risk of foodborne disease;
- increased awareness of basic food hygiene;
- increased confidence in the food supply; and
- improved quality of life (health and socio-economic).

The benefits to industry include:

- increased ownership and responsibility for the safety of their product with less attention on traditional reliance on government standards and inspection measures;
- increased market access;
- reduction in production costs (reduced recall/waste, greater efficiency);
- improved product consistency and quality;
- increased consumer and/or government confidence;
- improved staff-management commitment to food safety;
- decreased business risk;
- reduced legal and insurance costs; and
- capacity to accommodate and react to scientific and technological developments including advances in equipment design and changes in processing procedures.⁵⁶

The benefits to government include:

- improved public health and reduced public health costs;

⁵⁶ FAO, *Food Quality and Safety Systems – A Training Manual on Food Hygiene and the Hazard Analysis and Critical Control Point (HACCP) System*, (Rome: FAO, 1998), s. 2; JRG Consulting Group, OMAF, *Potential Support Mechanisms for Successful Implementation of HACCP in Ontario* (May 2003); OMAF, *Hazard Analysis Critical Control Points (HACCP), Background Paper, Draft 1* (2001); WHO, *Strategies for Implementing HACCP in Small and/or Less Developed Businesses*, (Geneva: WHO, 1999).

- more efficient and targeted food safety control;
- increased public confidence in the food supply;
- more efficient and effective government oversight based on records and documentation that allow inspectors to verify ongoing compliance; and
- promotion of industry and trade.⁵⁷

No system is perfect and a number of barriers to HACCP need to be considered and addressed. These include:

- significant costs associated with the development and implementation of the program including capital costs, training costs and consultant's fees;
- additional costs associated with training of management and staff;
- additional costs associated with initial and ongoing accreditation/verification;
- additional costs to develop and support HACCP plans; and
- additional costs to train inspectors and undertake a HACCP verification process.⁵⁸

Much concern has been raised in respect of the barriers faced by smaller and medium sized enterprises (SMEs) in implementing HACCP. Because many of the producers, including farms, abattoirs, food processors and food retailers in Ontario fall within this category, special consideration needs to be given to identifying and addressing these barriers which include:

- lack of belief that HACCP is worthwhile or can make a difference;
- lack of customer demand for HACCP;
- limited financial resources;
- inadequate infrastructure and facilities;
- inadequate knowledge, training and expertise;
- lack of government commitment and support;

⁵⁷ *Ibid.*

⁵⁸ *Ibid.*

- the perception that HACCP is too difficult and too expensive to implement;
- language and literacy barriers;
- lack of support and commitment from top management;
- increased red tape and documentation;
- complexities caused by multiple product lines; and
- lack of umbrella organizations to represent the food processors in certain areas.⁵⁹

There are effective strategies and measures that can be put into place to reduce these barriers. I will outline these later in this chapter.

3.6.5 Economic Benefits of HACCP

As noted earlier, foodborne illness places a heavy burden on society in the form of personal suffering as well as economic costs. More and more research is demonstrating what common sense would predict, that HACCP safety programs do make a difference in reducing pathogen levels and other contaminants in our food resulting in a reduction of foodborne illness.

Recognizing that the implementation of a HACCP program involves a substantial investment by both the provincial government and industry, it is worthwhile to consider whether there are associated economic benefits to offset the investments. The adoption of mandatory HACCP in many jurisdictions has been based, in part, on an estimation of HACCP's benefits and costs.

A number of studies have attempted to measure the economic benefits and costs of a HACCP program.⁶⁰ It is, however, difficult to accurately measure these benefits and costs, especially prior to implementation. One study in the U.K. concluded that there was increased access to overseas markets, customers were retained and new customers secured, the staff were more

⁵⁹ WHO, *Strategies for Implementing HACCP in Small and/or Less Developed Businesses*, supra note 56; JRG Consulting Group, OMAF, *Potential Support Mechanisms for Successful Implementation of HACCP in Ontario* (May 2003), p. 11.

⁶⁰ S. Henson et al., *Costs and benefits of implementing HACCP in the U.K. dairy processing sector*, *Food Control* (Vol. 10, Issue 2, April 1999), p. 99-106

motivated, microbial counts were lowered and there was reduced waste. HACCP plans were demonstrated to increase business opportunities at the same time as reducing costs with increased labour productivity and less waste.⁶¹

In Ontario, the economic impact of HACCP programs has not been formally estimated. Any such estimate would have to compare the costs to implement HACCP with the corresponding cost savings. The implementation costs would include the costs incurred by industry in implementing HACCP programs and also the costs to government in developing the program, providing the support measures to industry to implement HACCP and the costs of verification, recognition and ongoing auditing. On the other hand, there are potentially significant cost savings associated with implementation of HACCP programs. Once implemented and functioning, industry should see reductions in costs, improved efficiencies and less product recall, lower insurance and other risk management costs.

The greatest economic benefit relates to the reduction of foodborne illness attributable to HACCP programs. Research conducted in other jurisdictions has shown that HACCP programs do result in significant economic benefits in the form of reducing health care costs and increased productivity due to a reduction in absence due to food-related illness.⁶²

A recent study was conducted on behalf of OMAF to estimate the economic impact of proposed Ontario food safety initiatives designed with the goal to reduce foodborne illness by 30% over a five-year period.⁶³ The study concluded that (from 6 pathogens studied) a reduction in foodborne illness by 30% over 5 years would result in:

- between 19,300 and 27,600 fewer cases of foodborne illness per year;

⁶¹ L. Unnevehr & T. Roberts, *Improving Cost/Benefit Analysis for HACCP and Microbial Food Safety: An Economist's Overview*, (University of Massachusetts, 1997); E. Golan et al., USDA, *Tracing the Costs and Benefits of Improvements in Food Safety: The Case of the Hazard Analysis and Critical Control Point Program for Meat and Poultry* (AER-791, October 2000).

⁶² ARC Applied Research Consultants, OMAF, *Case Study Report: Economic Impacts of Proposed Ontario Food Safety System* (4 March 2002).

⁶³ OMAF, Science and Advisory Unit, *Hazard Analysis Critical Control Points (HACCP) Background Paper – Draft 1* (2001).

- between 1,600 and 2,200 fewer doctors' visits;
- between 160 and 230 fewer hospitalizations;
- between 6 and 8 fewer deaths per year;
- between 8 and 10 fewer chronic care cases; and
- between 31,800 and 45,400 fewer workdays lost due to illness.

The report projected that the present value of the health benefits saved over a 15-year period would be \$855.5 million. The likely health cost savings would be greater if additional pathogens were included in the analysis. The report estimated that the cost of the government initiatives to achieve the reduction of foodborne illness by 30% over the same 15-year period would amount to a present value of \$170.7 million. While the study is only an estimate and does not attempt to estimate the costs to industry, a reasonable inference can safely be drawn that any food safety initiative, including HACCP, that can decrease the amount of foodborne illness in Ontario by 30% would have a significant net economic impact on Ontario. Because these cost savings are in health care, which is a significant government expenditure, a reasonable investment by the provincial government in a program that reduces foodborne illness will likely result in a net positive economic impact for Ontario, in addition to the tangible benefits of improved health for its citizens.

3.7 Implementation of HACCP-Based Food Safety Programs

The provincial government has for some time recognized that there is a need to update Ontario's food safety system and, in particular, to update its standards and requirements to keep pace with developments in science, technology, international and national standards, consumer behaviour, and industry practices.⁶⁴ HACCP has been front and centre in its plans for reform.

⁶⁴ *Ibid.*, p.4

OMAF's Science and Advisory Unit summarized the need for HACCP in this way:

HACCP is now firmly established worldwide as the foremost means of assuring food safety throughout the food chain. In the future HACCP will be an essential vehicle in consideration of the equivalence of food safety control systems for nationally/internationally-traded food. In order for Ontario's food manufacturers to continue to provide the province with safe food products while remaining competitive, it has been recognized by OMAFRA (OMAF) that there is a need to update current standards and requirements in the processing environment.

The existing food safety system is based on traditional inspection. However, it is not possible to inspect safety and quality into food products and end product testing is usually destructive and gives assurances of only a small amount of the product produced. Traditional end product testing also requires the delay of distribution and does not fit with the demand for "fresh" product.

Within Ontario there is urgency in the need to move towards HACCP. Without HACCP, the province's food industry will suffer a loss of existing markets as well as a loss of access to new markets. Also, without HACCP there is increasing disparity with the federal food safety system, as well as international food safety systems.⁶⁵

There has been considerable discussion and debate including consultation with stakeholders with a view to identifying the best HACCP strategy for Ontario and deciding whether it should be made mandatory. To date, there has been a lack of will and/or resources to implement a mandatory program.

Before reviewing the current use of HACCP in Ontario, it is helpful to outline the development of HACCP in other jurisdictions.

3.7.1 European Union and United Kingdom

The European Union (EU), in spite of its unique structure and jurisdiction, has developed a systematic approach to HACCP for its member states.

⁶⁵ *Ibid.*, p.4.

The European Commission's (EC) approach to HACCP has been to develop a series of directives to be incorporated into the legal systems of the member states. In 1993, the EC adopted a general food hygiene directive based on some HACCP principles which came into effect in 1995.⁶⁶ It covers all stages beyond primary production, but does not include farms or abattoirs.

After a serious outbreak of *E. coli* O157:H7 in central Scotland in 1996 the Scottish government commissioned an expert report to investigate the cause and make recommendations to improve food safety.⁶⁷

This expert group, known as the Pennington Group, carefully considered the benefits of a HACCP system. They appropriately described HACCP as both a philosophy and a practical approach to food safety.⁶⁸ The Pennington Group's recommendations included that mandatory HACCP be implemented throughout the continuum from slaughterhouse to butcher shops. In making these recommendations, the Pennington Group stated:

*We endorse whole-heartedly the implementation of HACCP. We believe there is a particular need to raise the level of awareness of, and expertise in tackling the hazards involved in food handling and production. The most effective way of minimizing risk must be to influence the attitudes of all those involved throughout the food production process and to ensure that they take appropriate personal responsibility for the adoption of good practice in food handling and hygiene. We have had reports of its impressive effect in other countries. We, therefore, accept entirely that HACCP should underpin the approach to food safety at all stages of the food chain.*⁶⁹

In the U.K., regulations were enacted in 2002 requiring meat plant operators to introduce hygiene procedures based on HACCP principles and to undertake microbiological testing in red meat plants. These regulations

⁶⁶ EU, Council Directive 93/43/EEC on the hygiene of foodstuffs, [1993] O.J.L. 175/1.

⁶⁷ The Pennington Group, *Report on the circumstances leading to the 1996 outbreak of infection with E. coli O157 in Central Scotland, the implications for food safety and the lessons to be learned* (Scottish Office, 1998), available from <http://www.scotland.gov.uk/deleted/library/documents-w4/pgr-00.htm> [accessed 4 June 2004].

⁶⁸ *Ibid.*, Ch. 4, s. 4.2.

⁶⁹ *Ibid.*, Ch. 4, s. 4.7.

apply to all abattoirs and meat processors. Operators of small and medium-sized plants were given a phase-in period prior to mandatory compliance.⁷⁰

3.8 United States

The U.S. has also been active in implementing HACCP in its food safety programs. In the U.S., food products are regulated by two agencies. The Food and Drug Administration (FDA) oversees all domestic and imported food except meat and poultry which are regulated by the FSIS of the USDA.

The FDA mandated the implementation of HACCP for seafood plants in 1996 and for fruit and vegetables in 2001. With respect to meat and poultry, FSIS released its Final Rule on Pathogen Reduction and HACCP systems (Final Rule) on July 25, 1996.⁷¹ In all cases, mandatory HACCP requirements were phased in to allow industry a reasonable opportunity to implement the programs.

The HACCP models used by both FDA and USDA have common program elements, including the necessity of good manufacturing practices/sanitation operating procedures (GMPs/SOPs) as prerequisites together with a food safety program based on general HACCP principles. In addition, the programs require industry development of verification methods, implementation and maintenance of effective HACCP systems, and performance standards. The programs also have internal and external programs for education, training and sponsorship of research to evaluate HACCP and to develop program improvements.⁷² The performance standards set out in the Final Rule are drafted in such a way as to prescribe the expected levels of performance, while affording establishments considerable flexibility in determining how to achieve those standards. The guidebooks developed by FSIS for their HACCP plan follow the Codex principles, but allow each facility to develop its HACCP program as it sees fit. This approach requires greater involvement on the part of government

⁷⁰ U.K., Food Standards Agency, *HACCP in Meat Plants*, available from <http://www.food.gov.uk/foodindustry/meat/haccpmeatplants/> [accessed 4 June 2004]; *The Meat (Hazard Analysis Critical Control Point) Regulations 2002*, S.I. 2002/889.

⁷¹ USDA, FSIS, *Pathogen Reduction; Hazard Analysis and Critical Control Point (HACCP) Systems; Final Rule*, 61 Fed. Reg. 144 (1996).

⁷² J. Kvenberg et al., *HACCP development and regulatory assessment in the United States of America*, *Food Control*, 11:387-401 (2000).

inspectors and auditors who are required to examine each plant on an individual basis to determine if the HACCP plan is in compliance with the regulation.

FSIS conducted microbiological studies of meat and poultry establishments prior to the implementation of the Final Rule in order to set clear microbial performance standards. This allows FSIS the ability to evaluate the effectiveness of the mandatory HACCP regulation. The results to date have provided strong evidence that mandatory HACCP-based programs in the U.S. have resulted in a reduction of pathogen contamination in meat and poultry.⁷³ In May 2002, the CDC reported a 21% decrease in all foodborne illnesses in the U.S.⁷⁴ These results were attributed to a successful USDA strategy to reduce foodborne illness, the foundation of which was HACCP.

The CDC, through its emerging Infections Program Foodborne Diseases Active Surveillance Network (FoodNet), has been collecting data since 1996 on diseases caused by enteric pathogens transmitted through food. On April 30, 2004, the CDC reported on preliminary surveillance data for 2003, which showed substantial declines in the incidence of infections caused by five major pathogens. In particular, the data showed a one year 36% drop in *E. coli* 0157:H7 infections from 2002 to 2003 and a 42% drop overall since 1996. It is reported that efforts by the meat industry to reduce *E. coli* 0157:H7 in beef products are the major contributing factor to this downward trend. The CDC also reported that *Campylobacter* illnesses have dropped 28% and *Salmonella* illnesses dropped 49% since 1996. Foodborne illnesses caused by *Listeria monocytogenes* also showed significant decrease. The report specifically credits the control measures implemented by government agencies and the food industry, including enhanced food-safety education efforts and mandatory HACCP systems in meat slaughter and processing plants, as the primary reasons for the significant decreases.⁷⁵

⁷³ Meat Industry Internet News Service, *HACCP Program Has Cut Salmonella Risk* (23 March 2000), available from <http://www.spcnetwork.com/mii/2000/000368.htm> [accessed 4 June 2004].

⁷⁴ USDA, *Performance and Accountability Report for FY 2003*, *supra* note 18, p. 55.

⁷⁵ USDA, News Release, *Statement Regarding CDC Foodborne Illness Data Dr. Elsa Murano, USDA Undersecretary For Food Safety*, Washington, D.C. (29 April 2004); U.S., CDC, *Morbidity and Mortality Weekly Reports* (Vol. 53, No. 16, 30 April 2004).

3.8.1 Australia and New Zealand

Both Australia and New Zealand, through their food regulatory bodies, have been reviewing their meat inspection and food safety systems. To date, they have not enacted mandatory HACCP-based programs, but it appears that they are moving in this direction. The HACCP-based programs have been developed on a voluntary basis usually in order to comply with international standards for trade purposes.⁷⁶

3.8.2 Other Canadian Provinces

No other province has yet enacted mandatory HACCP at all stages. A number of provinces are, however, updating their food safety laws and are moving towards mandatory implementation of food safety systems based on HACCP including the National Meat and Poultry Regulations and Code (NMPRC). There is growing recognition by the provinces that HACCP must become part of their provincial food safety system.

3.9 HACCP in the Canadian Federal System

In 1991, the CFIA in conjunction with the food industry implemented the Food Safety Enhancement Program (FSEP). FSEP was initially a voluntary program designed to encourage and support the development, implementation and maintenance of HACCP systems in federally registered establishments involving meat, dairy, honey, maple syrup, processed fruit and vegetables, eggs and poultry hatcheries. By September 2004, FSEP will be mandatory in all federally registered meat and poultry establishments.

In announcing its intention to make FSEP mandatory, the CFIA gave four reasons for doing so:

- HACCP is science-based, and if properly designed and implemented, significantly reduces the risk of biological, physical or chemical hazards reaching the consumer. HACCP ensures that all aspects of an operation are analyzed on a continuous basis allowing for improvement and plant efficiencies and resulting in less product waste and fewer product recalls;

⁷⁶ OMAF, Science and Advisory Unit, *Hazard Analysis Critical Control Points (HACCP) Background Paper – Draft 1* (2001).

- HACCP systems are recognized under Codex as an internationally accepted standard for food safety and are already mandatory in many other countries;
- by setting out clear rules and responsibilities for industry and government in meat inspection activities, HACCP encourages shared responsibility for food safety leading to greater efficiency and effectiveness in the inspection process. Inspectors are able to focus more on critical food safety areas in the production process while trained industry employees assume more responsibility for detecting and removing food safety hazards; and
- mandatory FSEP provides the CFIA with the opportunity to adapt its meat inspection program to make it more effective. Inspection staff is given a broader scope for compliance and enforcement activities, focusing on the verification of the effectiveness of HACCP systems implemented by meat establishments and ensuring conformance with all applicable regulations and policies in them.⁷⁷

The FSEP program contains both prerequisite programs and the HACCP plan. The prerequisite programs include specific rules regarding premises, transportation and storage, equipment, personnel, sanitation and pest control and recalls. The HACCP plan involves the twelve step/seven principles endorsed by the CAC.⁷⁸

A very important part of the FSEP program involves various tools and aids, including implementation manuals,⁷⁹ a reference database for hazard identification, and other helpful resources to make the program understandable and easy to implement.

⁷⁷ CFIA, *The Food Safety Enhancement Program (FSEP): Mandatory FSEP for Federally Registered Meat and Poultry Establishments*, available from <http://www.inspection.gc.ca/english/fssa/polstrat/haccp/overvuee.shtml> [accessed 4 June 2004].

⁷⁸ *Ibid.*, p. 3; OMAF, Science and Advisory Unit, *Hazard Analysis Critical Control Points (HACCP) Background Paper – Draft 1 (2001)*, p. 33.

⁷⁹ CFIA, *FSEP Implementation Manual*, available from <http://www.inspection.gc.ca/english/fssa/polstrat/haccp/manu/manue.shtml> [accessed 3 May 2004].

The FSEP materials also include generic models covering many different processes and products that can be used as a starting point or a template for developing a customized HACCP plan.⁸⁰ There are at least 17 available generic models available for meat and poultry products from slaughter to various forms of processing.⁸¹ These materials and tools are readily available and reasonably priced.

The underlying philosophy of the FSEP plan is the partnership between the food industry and the government. Each food-processing establishment develops the HACCP system tailored to its own products and operations. The HACCP system must meet all current program requirements (regulations) and the six prerequisite programs. Each establishment must develop a HACCP plan which includes details on the CCPs and establishes that adequate control measures are in place for any potential hazards to be identified. The plant personnel are responsible for monitoring and verifying each control point, keeping accurate records, and taking appropriate corrective actions when potentially hazardous situations are noted.

Like most HACCP plans, the primary responsibility for ensuring that the HACCP plan is working properly is on management. The CFIA will verify the company's HACCP plan and no plant can be CFIA-recognized until the system has been fully evaluated using the requirements of the FSEP program. CFIA inspectors, in addition to their regular inspection function, will periodically audit the establishment's records and procedures, assessing specific control measures and corrective measures taken and observing the processing at CCP's. If the HACCP system is found to be non-compliant or ineffective, the inspector will identify a non-conformance and the plant will be required to take corrective action. Failure to comply would result in compliance or enforcement actions taken by the CFIA.

⁸⁰ For example, FSEP has generic models for meat and poultry products including beef, slaughter, boneless beef, cooked sausage, dried meat, ready-to-eat poultry products, ready-to-cook poultry products, poultry slaughter, hog slaughter.

⁸¹ CFIA, *Food Safety Enhancement Program HACCP Generic Models*, available from <http://www.inspection.gc.ca/english/fssa/polstrat/haccp/modele.shtml> [accessed 4 June 2004].

3.10 HACCP-Based Food Safety Programs in Ontario Abattoirs and Meat Processing Plants

There are currently no mandatory HACCP food safety programs in Ontario. Some provincially inspected meat plants have implemented HACCP on a voluntary basis often in conjunction with industry-developed programs. Some provincial plants have implemented HACCP due to market forces. Many customers, such as national grocery chains, require that all meat and poultry products come from a plant with a HACCP program.

OMAF has recognized the importance of HACCP-based systems and acknowledged that HACCP systems in meat production establishments enhance food safety, improve quality, decrease business liability and contribute to maintaining market share in a very competitive environment.⁸² OMAF has undertaken considerable study and stakeholder consultation in respect of HACCP and has three HACCP advisors on staff.

The stakeholder consultation process has shown significant support for science-based food safety standards including HACCP, microbial performance standards and food handler training, as long as there is appropriate government oversight and recognition.⁸³ Some licensed operators have raised concerns regarding costs of implementation, level of record keeping and the capacity of the provincial government to provide appropriate assistance. Most stakeholders recognize a need for a HACCP program, but want a role in developing and implementing the program.

In response, OMAF in consultation with industry and appropriate food safety experts, developed a voluntary HACCP program for food manufacturers in Ontario called HACCP Advantage. This program was unveiled for voluntary implementation on March 8, 2004. The HACCP Advantage Program consists of 57 prerequisite program standards and eight HACCP plan forms.⁸⁴ The prerequisite programs designed to control

⁸² OMAF, Science and Advisory Unit, *Hazard Analysis Critical Control Points (HACCP) Background Paper – Draft 1* (2001), p. 5 & 6.

⁸³ OMAF, *Report on Consultations for the Provincially Regulated Meat and Poultry Industry* (September 2001).

⁸⁴ M. Elliott et al., OMAF, *The HACCP Advantage: Program Manual*, (Toronto: Queen's Printer for Ontario, 2003).

environmental and personnel-related hazards are divided into four groups: Control Programs, Training, Operational Controls and Environmental Controls. Each of these four categories is divided into sub-groups containing individual standards of performance. The HACCP plan development has 12 steps. The first five are preliminary steps that must be addressed prior to applying the seven HACCP principles. The completion of the forms will generate CCPs where key hazards are identified together with controls that are needed to eliminate, prevent or reduce the hazard to an acceptable level.

The HACCP Advantage Program appears to be a relatively straightforward, user-friendly program supported by an easy to use manual with some additional tools and resources readily available. While it is too early to assess the success of the HACCP Advantage Program, my impression of the overall program is favourable. Initial feedback from industry has also been positive. The strength of the HACCP Advantage Program is that it maintains the integrity and requirements of a true HACCP system as outlined by CAC and, at the same time, is practical and feasible for all facilities regardless of size, the commodity produced or volume processed. Additional materials, including a guidebook, are under development. There are no specific generic model or hazard identification databases developed to date and there have not been any specific guidelines or strategies developed for SMEs.

Recognition and verification are important elements of any HACCP program. These elements of the HACCP Advantage Program have not yet been fully unveiled. The current plan is that the recognition would be delivered by the CGSB. The operator would design and implement its HACCP system and then apply directly to the CGSB for recognition. The CGSB would then schedule and conduct a HACCP audit. The results of the audit would be provided to the facility with a certificate of recognition from CGSB and OMAF. Certified establishments will be listed on OMAF's website. It is expected that certification will be done on a three-year cycle requiring a full re-certification audit every three years and partial audits in between. Audits will consist of documentation review and on-site visits.

3.11 Will HACCP Work in Ontario?

As mentioned earlier, results from studies done to date in the U.S. and U.K. demonstrate that HACCP does improve food safety because it reduces the level of contamination of the meat. At the federal level, the CFIA has not yet measured the effectiveness of FSEP and is conducting baseline studies in order to do so.

In order to test the HACCP Advantage Program, OMAF supported a Proof of Concept project involving a medium-sized provincially licensed poultry slaughter facility. The purpose of the project was to apply HACCP in a SME, to demonstrate and test its economic feasibility and effectiveness in achieving food safety outcomes.

The Proof of Concept project began in the summer of 2003 and is expected to be completed in the fall of 2004. OMAF advises that preliminary results from the project demonstrate that the HACCP Advantage Program has had a very positive impact on reducing pathogen contamination. Those results show that with the implementation of HACCP, the prevalence of *Salmonella* on chicken carcasses was reduced by 61% and the prevalence of *Campylobacter jejuni/coli* was reduced by 71%, *Salmonella* and *Campylobacter jejuni/coli* counts dropped by 78% and 94% respectively. These results are impressive because the particular plant being tested was already a highly rated plant by OMAF even before HACCP was implemented.

Earlier in this report, I reviewed in detail the importance and benefits of a mandatory HACCP-based food safety program. The HACCP Advantage Program is a good program, although there is additional work to be done to complete its development. While there has been significant interest expressed by operators, it remains to be seen how widely it will be adopted voluntarily.

At this time, OMAF has no specific plan to make the HACCP Advantage Program mandatory. If HACCP is to be mandatory in Ontario, it is my view that the HACCP Advantage Program is an appropriate model to be used at abattoirs and food processors. HACCP Advantage remains a work in

progress and further development is required to develop more process specific generic models and implementation tools. A plan to reduce barriers for SMEs and a developed recognition and verification program are also required.

Earlier in this report, I recommended that in conjunction with the proclamation of the *FSQA*, the Province of Ontario adopt meat and poultry regulations that are equivalent to the NMPRC. The adoption of NMPRC will require a mandatory HACCP-based food safety program including written sanitation, pest controls and maintenance programs, HACCP plan and microbiological performance standards.

3.12 Should HACCP be Voluntary or Mandatory?

HACCP originally developed as a voluntary program. Many larger companies and industry associations implemented HACCP to respond to international trade and market demands. There is a very clear trend toward mandatory HACCP food safety programs in all meat plants. HACCP is now mandatory in meat plants in the U.S., U.K. and in federally inspected plants in Canada.

OMAF consulted with operators of provincial meat plants in developing its HACCP program. The feedback from them has consistently been that HACCP should be voluntary and not mandatory. In my own discussions with operators of provincial plants, I heard a similar message from some operators. However, a significant number of operators also felt that HACCP food safety programs were important and should be made mandatory, albeit with appropriate assistance from the provincial government. This assistance should include support to develop and implement the plans, to provide training and financial assistance for costs of implementation and capital improvement costs. Concerns have been expressed to me that a mandatory HACCP program may cause a number of the small operators to suffer financial distress and perhaps go out of business. This could lead to a shortage of abattoir services in some areas or for some segments of the market currently serviced by these small operators.

Supporters of mandatory HACCP argue that in order to restore consumer and business confidence in provincially inspected meat, a mandatory

HACCP program is necessary. Opponents of mandatory HACCP argue that HACCP should be voluntary rather than mandatory to alleviate economic burdens, especially on small businesses. They suggest that market forces and advancing technology will cause HACCP programs to be implemented on a voluntary basis.

In the U.S., these opposing viewpoints were debated extensively. In the end, FSIS determined that mandatory HACCP was “the only viable option”⁸⁵ and concluded that HACCP was the optimal framework for targeting and reducing the many potential, but largely preventable, hazards associated with meat and poultry products and the risks of related foodborne illness would be minimized to the greatest extent possible only if the HACCP systems were implemented in every establishment.⁸⁶

I am very sensitive to the concerns raised by small plant operators. I do, however, believe that there are ways to overcome these concerns, and that mandatory HACCP can be implemented in all plants irrespective of size, in such a way that would allow those operators to remain financially viable. I believe that once properly implemented, HACCP food safety programs will help to create an industry that will thrive and will produce meat that is safer. This will help restore consumer and business confidence in the meat and poultry industry which may have been lost. It is important to remember that it takes only one incident of unsafe meat entering the system to damage public confidence and to cause serious damage to the industry as a whole. Such an incident can occur in a large or small plant with similar devastating impact on the whole industry. The general public will not make a distinction between a plant with or without a HACCP system. Accepting, as I do, that HACCP will make meat safer, there is no good reason not to hold all provincial plants to the same standards provided that appropriate supporting measures and assistance are provided to address the concerns of SMEs.

⁸⁵ USDA, FSIS, *Pathogen Reduction; Hazard Analysis and Critical Control Point (HACCP) Systems; Final Rule*, *supra* note 69, p. 38820.

⁸⁶ *Ibid.*, p. 38821.

3.13 HACCP in Small and Medium Sized Enterprises

SMEs have considerable concerns that they will face undue hardship if they are required to implement a mandatory HACCP program. I believe it is important to address these legitimate concerns and to recommend steps that should be taken by the provincial government to minimize any hardship.

The seven HACCP principles can be applied to any type of operation regardless of size. It has been suggested that the principles of HACCP should be scaled down for implementation in smaller facilities, but there is an equally legitimate concern that this could compromise food safety.⁸⁷

Mandatory HACCP programs in small facilities have been successfully implemented in various jurisdictions. FSIS has reported that mandatory HACCP programs have been successfully implemented in approximately 6,500 national and state-inspected meat and poultry facilities in the U.S., a large portion of which were SMEs.⁸⁸ The major strategies included a phase-in of the mandatory program to accommodate smaller producers and to make appropriate training and support tools readily available.

FSIS put a number of support structures in place specifically for smaller plants including:

- appointed a National HACCP Small Plant Coordinator to coordinate a Small Plant Outreach Program;
- established a network of contacts and coordinators throughout the country who disseminate information on HACCP and provide technical guidance to small plants;
- asked large plants to act as sponsors for small plants to provide technical assistance, guidance and industry-oriented advice;
- held a series of implementation meetings around the U.S. to prepare for implementation in small plants;
- provided language assistance;

⁸⁷ *Ibid.*, p. 38819-38820; T. Mayes & S. Mortimore, *Making the most of HACCP*, (Cambridge: Woodhead Publishing Limited, 2001).

⁸⁸ U.S. Food and Drug Administration, *Hazard Analysis and Critical Control Point (HAACP); Procedures for the Safe and Sanitary Processing and Importing of Juice; Final Rule*, 66 Fed. Reg. 13 (2001).

- developed generic HACCP models for a variety of processes;
- established a HACCP hotline to field questions from industry; and
- sent a series of letters to small plants to remind them of key preparation tasks and provide advice on when these should be accomplished so that implementation deadlines could be met.⁸⁹

Similarly, in the U.K., a special program was designed to provide assistance for SMEs⁹⁰ in the implementation of their mandatory HACCP program.

In the development of a HACCP model for Ontario, OMAF identified several requirements that are critical for the successful implementation of HACCP in SMEs including:

- a strong requirement for a sound GMP program to control all general hazards and thus allow for control of many specific hazards in the HACCP plan;
- HACCP must be implemented by a properly trained person or group who possesses the knowledge, understanding and expertise in identifying hazards and assessing risks as well as the technical expertise in food microbiology and food chemistry;
- a trained, competent workforce that can develop, operate and maintain the newly implemented HACCP system; and
- full commitment from management and the workforce with an overriding internal belief in the HACCP approach and what it can accomplish.⁹¹

OMAF commissioned a consultant to review the potential support mechanisms for successful implementation of HACCP in Ontario in 2003.⁹² The consultant identified 28 potential support measures, but in the end

⁸⁹ U.S., FSIS, *HACCP Implementation – Phase III for Very Small Plants* (1999), available from <http://www.fsis.usda.gov/OA/background/phase3.htm> [accessed June 6, 2004]; Meat Industry Internet News Service, *HACCP Program Has Cut Salmonella Risk*, *supra* note 73.

⁹⁰ T. Mayes & S. Mortimore, *Making the most of HACCP*, *supra* note 87.

⁹¹ M. Brown, *HACCP in the Meat Industry*, (Cambridge: Woodhead Publishing Limited, 2000); S. Mortimore, *How to Make HACCP Really Work in Practice*, *Food Control* (Vol. 12, Issue 4, June 2001), p. 209-215.

⁹² JRG Consulting Group, OMAF, *Potential Support Mechanisms for Successful Implementation of HACCP in Ontario* (May 2003).

recommended 15 support measures for consideration as part of Ontario's overall HACCP approach. The recommended measures were as follows:

- provide low cost training to operators (at, or close to, the work site);
- provide sector specific guide and workbooks to implementing HACCP (at minimal cost);
- provide Ontario food processors access to an OMAF supported HACCP website;
- provide on-site assistance and extension services (at minimal cost);
- provide materials to assist with prerequisite compliance;
- provide information on CCPs common to industry sectors;
- provide generic HACCP models for each sector;
- provide information on SOPs for each sector;
- provide access to sector specific hazard databases;
- provide sector specific templates for record keeping;
- provide awareness-building activities;
- provide pre-HACCP business case analysis;
- provide a third party advisory panel for SMEs;
- provide on-going assistance to operators through field staff/extension agents; and
- provide tax incentives for food safety and HACCP training.

The consultant's report provides a detailed analysis of the options and how they could be implemented.

Many strategies have been developed for the implementation of HACCP in SMEs which have been successful in other jurisdictions. Much can be learned from those experiences. A WHO consultation group prepared a detailed and helpful report outlining strategies for implementing HACCP in small and/or less developed businesses which, in my view, sets out a helpful blueprint and foundation for the province to use as specific strategies are

developed.⁹³ Additional strategies recommended by the WHO consultation group include:

- engaging industry and trade associations to promote HACCP in SMEs and to support them in the implementation of the HACCP system;
- prioritizing the industry sectors for which the implementation of HACCP is more important and phase-in mandatory HACCP based on these priorities and focus implementation on a sector-by-sector basis;
- establishing HACCP implementation committees in collaboration with all interested parties including consumers, industry representatives and trade associations;
- funding initiatives to accelerate the implementation of HACCP in high-risk sectors;
- bulk purchasing of equipment or services by industries/trade associations or government to support HACCP implementation and minimize the cost of implementation by individual businesses;
- providing relevant and technical training with consideration to the level of education, culture and language of SME managers and staff;
- facilitating availability of appropriate, current scientific support and low cost laboratory services;
- communicating to industry with respect to the need for change and the benefits of HACCP; and
- measuring the cost benefits of the HACCP program once implemented to demonstrate the effectiveness of HACCP and the success of the program.⁹⁴

A mandatory HACCP program for Ontario should contain as many of the measures set out herein as practicable to ensure that the HACCP program is successfully implemented in all plants in such a manner as to minimize the

⁹³ WHO, *Strategies for Implementing HACCP in Small and/or Less Developed Businesses*, *supra* note 56.

⁹⁴ *Ibid.*, p. 6-11.

financial burden to SMEs and to ensure that the programs operate effectively.

3.14 Summary and Conclusions re HACCP

The Expert Advisory Panel recommends that a mandatory HACCP-based food safety system should be implemented continuously from production through to the retail and food service sector.⁹⁵ They recommend that an overall framework should be built for the whole food continuum concurrent with the development of the producer and processor programs. The basic framework should be continuous, transparent, user-friendly and easily understood by all. In making this recommendation, the Expert Advisory Panel states:

HACCP-based food safety has been accepted globally as the “gold standard” for food safety programs. In Canada, it is being applied across the food continuum, from the farm through to the consumer, although not with equal degrees of maturity in all sectors. Therefore it seems logical to apply its principles at provincial and local levels. Emphasis to start should be placed at the primary production and processing levels. The raw material for the processor comes from the farm and is an essential ingredient for building a strong HACCP-based food safety program at the slaughter plant. Healthy, clean, well nourished, stress-free animals produce higher quality and safe food products. It is easier to keep safe an already safe product and possibly improve food safety throughout the continuum than it is to build food safety into the product. This is particularly true with fresh, perishable products.⁹⁶

I agree with this statement and adopt it.

The Expert Advisory Panel has recommended a phase-in period of three to five years depending on the grace period during the initial implementation, which might last up to two years. I agree that this is a reasonable period of time. When FSIS implemented mandatory HACCP in 1996, it required all large plants (greater than 500 employees) to comply by January 1998,

⁹⁵ Expert Advisory Panel Report, *supra* note 1, p. 140.

⁹⁶ *Ibid.*, p. 139.

smaller plants by January 1999 and very small plants (less than ten employees) by January 2000. Most other jurisdictions who have implemented mandatory HACCP have done so with a reasonable phase-in period. In my opinion, Ontario should adopt a similar approach.

I recommend that the provincial government promulgate regulations to require mandatory HACCP-based food safety programs across all sectors of the food continuum including farms, abattoirs, transportation, free standing meat processors and food premises.⁹⁷ This food safety program should adhere to or surpass internationally recognized food safety guidelines and principles including the Codex. This food safety program should include distinct programs for all sectors of the food continuum keeping in mind the particular characteristics and risks associated with each sector. The programs should include an appropriate verification and recognition process.

I recommend that the provincial government provide appropriate resources to support the development and implementation of mandatory HACCP-based food safety programs and to ensure there is appropriate training of inspectors, auditors, operators and employees involved in these programs. I also recommend that the provincial government develop appropriate written materials and tools, guidelines, and generic models for industry and make them readily available at a reasonable cost.

I recommend that the provincial government develop a strategy to provide support and assistance to small and medium-sized enterprises in the implementation of mandatory HACCP programs. This support and assistance should include the measures that I have referred to in my Report. It must be recognized by the provincial government that SMEs will require added support to minimize the financial burden associated with HACCP implementation. **I recommend that the provincial government provide small and medium-sized enterprises with financial assistance in the form of grants and low interest loans to be applied towards HACCP implementation costs including capital costs.**

⁹⁷"Food Premises" as defined in the *Health Protection and Promotion Act*, R.S.O. 1990, c. H.7.

Mandatory HACCP should be implemented with an appropriate phase-in period to provide additional time for SMEs to comply. Mandatory HACCP in larger operations should be implemented as soon as possible and within a period not exceeding one year. With respect to SMEs, I would suggest that the phase-in period occur over a period of two to three years with specific deadlines for implementation over these four stages.

1. implementation of all prerequisite programs;
2. HACCP studies to identify specific areas that need additional control;
3. development of valid CCP control measures and monitoring routines; and
4. full HACCP implementation including appropriate systems of verification and review.

During the Review, some operators of smaller plants expressed some frustration that they were doing their best to comply with all food safety laws and regulations, but that the rules were constantly changing. As an example, one operator explained how substantial capital investment had been made in the business to improve facilities with the knowledge and approval of an OMAF official only to find shortly thereafter that the standards had changed and the renovated facility was not in compliance with current requirements.

It must be recognized that producers of food in Ontario need to have assurance that as a result of their investment and efforts, they will achieve a reasonable rate of return. A producer who is not profitable will not continue to operate indefinitely. These producers need an opportunity to plan for changes that will impact their business. They need a reasonable opportunity to know the expectations that will be placed upon them and have an opportunity to budget for implementation of those requirements to avoid undue financial stress.

The goal of food safety requirements including HACCP is not to destroy producers' livelihoods, but is rather to implement a system of making food production safer in such a way that will be better for the consumer as well as

for the producer. For that reason, the provincial government should develop the mandatory HACCP plan for each sector at the earliest opportunity in consultation with industry, organizations and producers. Once these plans are finalized, a reasonable time frame should be set for their implementation. Government, however, should give producers the earliest notice of its intention to implement mandatory HACCP and any other mandatory requirements so that producers can start to plan and budget in order to meet what will be expected of them.

I recommend that in developing mandatory HACCP-based food safety programs, the provincial government establish clear food safety objectives and prioritize hazards along the food continuum to ensure the areas of greatest risk are effectively identified and managed.

3.15 Traceability

3.15.1 Introduction

An ideal food safety system has an infrastructure to trace the origins and destination of whole and processed food and their inputs.⁹⁸ Traceability is an important component of a comprehensive food safety system for two reasons, namely, disease control in the event of an outbreak and emergency food recalls. It also increases consumer confidence. Traceability is the ability to trace the history and location of an item by means of recorded identification. Common elements of any traceability system are unique identifiers for each item traced, a data capture and transfer system and a recording system which allows for reliable management of the information as the item moves from one place to another.⁹⁹

The importance of traceability was seen in the recent case of a BSE positive dairy cow in the U.S., where traceability mechanisms in the dairy industry in Canada and the U.S. were used to identify the exact Alberta herd from which the animal originated, allowing a concerted disease control effort to focus on other cows from the same herd. In light of the importance of

⁹⁸ *Expert Advisory Panel Report, supra* note 1, p. 134.

⁹⁹ OMAF, *On-Farm Food Safety Strategy for Ontario, Background Paper Working Group 5: Traceability* (16 January 2004), available from http://www.gov.on.ca/OMAFRA/english/offacts/back_gr5.htm [accessed 20 May 2004].

traceability to food safety, governments have an important role to play in the development and ultimate implementation of traceability systems.

Traceability will improve meat safety as there will be ongoing accountability for the wholesomeness and safety of the meat product from farm to fork. In addition, in the event a meat safety problem is identified at any point in the continuum, there is the ability to follow the path of the meat product to determine the origin and cause and to reduce or eliminate its adverse impact. Traceability also helps with herd/flock management and inventory control and is important to industry branding and quality assurance programs and organic certification.¹⁰⁰

The ability to trace meat from initial production to consumer sale is a difficult and complex process. Traceability relies upon science and technology to create systems that are effective and affordable together with properly trained people to implement them. Traceability systems using radio frequency identifiers are now widely in use and traceability systems using DNA fingerprints are under development for commercial usage.¹⁰¹ Traceability is continuing to evolve, as new technologies and standards are being developed to make it feasible from farm to fork.

3.15.2 Definition of Traceability

While there is widespread international support for traceability, there is considerable disagreement as to its definition and scope of application.¹⁰² The Codex Committee on General Principles is currently attempting to define traceability/product tracing of food and to develop principles for its application.¹⁰³

¹⁰⁰ *Ibid.*, p. 2.

¹⁰¹ Beef Improvement Ontario is currently testing DNA tracing in cattle. The Ontario Sheep Marketing Agency is undertaking a pilot project using DNA technology to trace lamb from farm to retail. Maple Leaf Foods Inc. is developing a product identification program for pork using DNA technology.

¹⁰² Codex Alimentarius Commission, *Definition of Traceability/Product Tracing of Foodstuffs, Government Comments*, Codex Committee on General Principles, 20th Sess., CX/GP 04/20/6-Add.1 & 2 (Paris, 3-7 May 2004).

¹⁰³ The definition of traceability being considered by the Codex Alimentarius Commission relates to tracing as a tool to promote food safety and fair trading practices as well.

The proposed definition being considered is as follows:

The implementation of measures to ensure, at any stage of the food chain, that the path of a food and the relevant information about it are known including:

- *product identification, a unique means to identify a food or batch thereof;*
- *product information;*
- *the raw materials used;*
- *how it was changed (if appropriate);*
- *where and when it came from and where and when it was sent (one step backward and one step forward);*
- *the controls, which the product has been subject to; and*
- *the linkages between product identification and product information.*¹⁰⁴

Traceability has two key components, tracking and tracing.¹⁰⁵ Tracking is the ability to follow a product's path as it moves through the continuum forward from the point of production to the point of consumption. In the meat industry, animal identification and tracking systems allow for an animal's movement to be followed over time, identifying and recording all locations of the animal over its lifetime. Tracking systems may include the physical identification of the individual animal or group of animals (flock) and the recording of details of health treatments and movements.

Tracing, on the other hand, is the ability to identify the origin of a product or group of products by moving upstream in the continuum to trace the history of its production back to the point of origin.¹⁰⁶ Although the terms tracing and/or tracking are sometimes used interchangeably, the paths they describe

¹⁰⁴ Codex Alimentarius Commission, *Definition of Traceability/Product Tracing of Foodstuffs, Government Comments*, *supra* note 102, Appendix I.

¹⁰⁵ The Electronic Commerce Council of Canada, *Can-Trace Initiative: Tracking and Tracing of Food Products in Canada* (9 December 2003), p. 5., available from <http://www.can-trace.org/About/docs/TrackingAndTracingInitiativeWhitePaper.pdf> [accessed 18 June 2004].

¹⁰⁶ *Ibid.*, p. 15.

go in opposite directions. Animal identification must be distinguished from traceability, as it is usually just the first step in a traceability program.

Premises identity is also an important component of a traceability system as all premises that hold a commodity need to be identified and recorded.

3.15.3 Development of Traceability Models

The development of traceability models and the necessary technology to implement them has been driven by industry. Traceability creates access to new markets and the ability to preserve the identity of a product's quality and content and inventory management processes. There are many different traceability models in use around the world that generally follow one of three patterns. The one-up/one-down system is the simplest and most common system and requires that specific products received and products shipped be documented along the continuum. The commodity/segment system focuses on a particular commodity and its route through the continuum from raw material to point of sale. The central data management system involves the centralization of data related to the product and allows easy and rapid tracing of a product along the continuum.¹⁰⁷

Throughout the world, a number of industry groups and organizations have developed standards for product identification and tracing.¹⁰⁸ The bar codes seen on various products are examples of these international standards. In the food industry, European Article Number and Uniform Council Code (EAN.UCC)¹⁰⁹ systems are widely accepted commercial identification and communication standards. EAN.UCC has developed models specifically for

¹⁰⁷ *Ibid.*, p. 12-14.

¹⁰⁸ *Expert Advisory Panel Report, supra* note 1, p. 16.

¹⁰⁹ EAN International, News Release, *United Nations recommend EAN•UCC System for the identification of Meat Carcasses and Cuts* (21 March 2001), available from <http://www.ean-int.org/pressreleases/Meat%20Carcasses%20and%20Cuts.html> [accessed 3 June 2004]; The Electronic Commerce Council of Canada, *Can-Trace Initiative: Tracking and Tracing of Food Products in Canada, supra* note 105, p. 15; EAN International, *About EAN International: History*, available from <http://www.ean.int.org/history.html> [accessed 19 May 2004]; The Electronic Commerce Council of Canada, *Can-Trace Initiative (Roadmap document): Industry Action Plans for the Development of Common Standards for the Tracking and Tracing of Food Products in Canada, Final* (5 December 2003), available from <http://www.can-trace.org/About/docs/WEBRoadmap%20V2.pdf> [accessed 4 June 2004].

meat which provide for product traceability from a live animal through to the point of retail sale.¹¹⁰

3.15.4 Traceability in Other Jurisdictions

Traceability is a much-discussed issue worldwide. However, few countries have developed a full traceability system that operates throughout the food continuum. Many countries have animal identification programs that track animals from the farm to the abattoir. A significant number of countries are expanding their animal identification programs toward a complete traceability system. There is also a movement toward making traceability systems or parts thereof mandatory. Belgium, New Zealand, Ireland and the U.K. have shown leadership in developing mandatory traceability systems. In the U.K., outbreaks of BSE and foot and mouth disease (FMD) were the catalysts for these initiatives. In Belgium, food contamination that resulted from the discovery of dioxin in animal feed was the impetus for the development of a mandatory animal identification program in 1999. New Zealand, which relies heavily on agriculture, undertook mandatory traceability in order to preserve and enhance its access to international markets.¹¹¹

In the European Union, all livestock are required to be tagged within 20 days of birth. Each animal is given an identification code which follows the animal through a mandatory meat labelling system. A passport is issued for livestock containing the identification code, birth date, sex, breed or coat colour, identification code of the dam and sire, identification code of the farm of birth and all farms where the animal has been kept. The passport must accompany the animal through all movements. The European Community has adopted various other regulations to promote the traceability of all food products. New regulations scheduled to come into

¹¹⁰ The beef model starts with each animal having an ear tag number and a valid passport or health certificate to the abattoir where a carcass ticket is produced with appropriate bar code which then becomes a processing label as the meat is cut and then ultimately a consumer label of the packaging at the point of sale. The bar code system contains various information in respect of the meat which enables the product to be traced back to the specific live animal.

¹¹¹ OMAF, *On-Farm Food Safety Strategy for Ontario, Background Paper Working Group 5: Traceability*, *supra* note 99.

force in January 2005 will place traceability obligations on all operators in the food system.¹¹²

Primarily in response to BSE, Japan has legislated a compulsory system of full traceability of cattle from farm to retail sale. Each animal's identification number, breed, sex and production history is entered into a national database.¹¹³

The U.S. is in the process of implementing an animal identification program.¹¹⁴ The U.S. legislation on Country of Origin Labelling (COOL) will require mandatory tracking and labelling for beef, lamb, pork, fish and a number of other items.¹¹⁵ At present, the system is voluntary. Due to domestic and international opposition, the COOL provisions were amended in January 2004 to delay its implementation until September 30, 2006, except for fish and seafood for which COOL will be mandatory on September 30, 2004.¹¹⁶

3.15.5 Traceability of Meat in Canada

In Canada, the federal government, through its Agricultural Policy Framework, has set a goal to put in place comprehensive tracking and tracing systems throughout the food continuum and has set an ambitious objective of achieving 80% traceability for Canadian foods by 2008. One of the stated purposes of this goal is to increase the capacity for targeted, effective responses to potential disease or contamination outbreaks.¹¹⁷ The goal, however, requires industry to take the lead in defining traceability standards and solutions.

¹¹² Quebec, *Emerging Food Safety Issues in Quebec: Discussion Paper*, (Quebec: Secretariat des Commissions, National Assembly, 2003), p. 29; C. Peck, ed., *Around the ID World*, BEEF (1 December 2003), available from http://articles.findarticles.com/p/articles/mi_m0HDV/is_4_40/ai_111090901 [accessed 25 May 2004].

¹¹³ *Ibid.*, C. Peck, ed., *Around the ID World*.

¹¹⁴ *Ibid.*

¹¹⁵ *Farm Security and Rural Investment Act of 2002*, Public Law 107-171, May 13, 2002.

¹¹⁶ C. Hanson, *Industry groups unite over voluntary COOL* (26 May 2004), available from <http://www.meatingplace.com> [accessed 4 June 2004].

¹¹⁷ The Electronic Commerce Council of Canada, *Car-Trace Initiative: Tracking and Tracing of Food Products in Canada*, *supra* note 105, p. 5.

The Canadian food industry, through an initiative called “Can-Trace”, is working to develop the framework for a Canadian food traceability system.¹¹⁸ In April 2004, Can-Trace released draft traceability standards which are being tested and validated in pilot projects involving beef and pork.¹¹⁹

In Canada, there is no national strategy for traceability that allows meat to be traced from farm to fork. The Expert Advisory Panel has noted:

*The current fragmentation of the federal and provincial food system does not lend itself to a seamless tracking of products and because of this it is likely that commodity groups will create their own specific systems in response to buyer requirements. The technology to support a traceability system infrastructure is available, but the methods and barriers to effective implementation have been inadequately researched to date.*¹²⁰

3.15.6 Animal Identification and Tracking in Canada

In Ontario and throughout Canada, cattle identification and tracking is undertaken pursuant to the Canadian Cattle Identification Program administered by the Canadian Cattle Identification Agency (CCIA).¹²¹ The CCIA is a non-profit industry-based agency that developed animal identification, herd of origin and tag retirement programs for cattle and bison.¹²² Since January 1, 2001, the program has been mandatory.¹²³ The CCIA administers the program on behalf of the federal government. Under the program, an approved ear tag displaying a specific number is attached to

¹¹⁸ The Can-Trace project is being undertaken by the Electronic Commerce Council of Canada (ECCC), which is the Canadian counterpart of EAN-UCC. See <http://www.can-trace.org/About/?langid=e&pageid=main>.

¹¹⁹ Representatives of the federal government and four provinces, including Ontario, participated in the early group drafting these standards.

¹²⁰ *Expert Advisory Panel Report, supra* note 1, p. 15.

¹²¹ Canadian Cattle Identification Agency, Details of the Canadian Cattle Identification Program, available from <http://www.canadaid.com/about/details.shtml> [accessed 3 June 2004].

¹²² Canadian Cattle Identification Agency, *What is CCIA?*, available from http://www.canadaid.com/about/what_is.shtml [accessed 19 May 2004].

¹²³ Participation in the program is mandatory for all Canadian cattle, bison and sheep under the authority of regulations under the *Health of Animals Act*. The Canadian Livestock Identification Agency (CLIA) will assume responsibility for this program.

each animal prior to leaving their herd of origin. The tags are to be retired when the animal is disposed of through slaughter or other means. Animals that lose tags are to be re-tagged. The CCIA system only traces the animal to the point of carcass inspection. Participation in the program has been expanded in 2004 to include sheep.¹²⁴ All information reported to the CCIA is entered into a confidential database. In the event of a health or safety issue involving an animal, CFIA is provided access to the database.

The current system has a number of limitations. The information that is traced is restricted to herd of origin. There are problems with lost ear tags, tag collection and information reporting; all of which create gaps in the ability to trace an animal from farm to the abattoir.

There will be improvements when the current bar coded tags are phased out by 2005 and replaced with electronic tags using radio frequency technology. These radio frequency identification tags will allow additional information to be tracked including birth date, age and pedigree of the animal as well as all animal movements. This will be important in respect of cattle in establishing whether an animal is 30 months old or older, as BSE precautions and surveillance are generally aimed at these older cattle.¹²⁵

The Province of Quebec has the most advanced system of cattle traceability in Canada with a system that provides for full traceability/tracking from birth to processor. Currently, the program applies to cattle only but is to be extended to sheep and hogs. Electronic identification tags which meet all requirements of CCIA must be applied on all cattle within seven days of birth and replaced within seven days, if lost. Producers or their proxies are required to activate the tags in the government database. The system tracks the animal's place of birth and all of its movements within Quebec. The system requires the traceability link to be established within two hours of a tracing request and each establishment is required to conduct an annual

¹²⁴ The Canadian Sheep Identification Program (CSIP) was implemented January 2004 and traces animal movement.

¹²⁵ Canadian Cattle Identification Agency, *CCIA Assistance to BSE Investigation*, CCIA News (Spring 2004).

evaluation of the traceability system both upstream and downstream.¹²⁶ Quebec is currently considering expanding its traceability system to trace meat from the processor to retail sale.

3.15.7 Traceability in Ontario

While Ontario does not have a formal traceability program, OMAF has been working on such a program and has been supportive of various national traceability initiatives. As part of OMAF's on-farm food safety strategy (OFSS), a working group was created with a view to developing an action plan for traceability including premises identification and registration. This working group has put forward two recommendations now also approved by the OFSS Steering Committee. These recommendations are the formation of a non-governmental traceability entity in Ontario working within the national framework and the development of a premises identification model that would uniquely identify Ontario farm premises.¹²⁷

At the present time, there are no plans nor initiatives underway in Ontario to develop a traceability program that would operate throughout the food continuum. The current focus is on birth to slaughter of animals.

One traceability initiative that OMAF is involved in is the barbeque pig identification and certification program designed to ensure residue-free weaner and suckling pigs. As part of that program, OMAF created and now maintains a database of the performance record of each barbeque pig producer and now adjusts the frequency of residue testing accordingly.¹²⁸ There has been a substantial reduction in residues since the program was introduced. This initiative suggests that if a traceability system is in place, it will be easier to identify and to correct pathogen, disease or residue issues whatever their source.

¹²⁶ *Emerging Food Safety Issues in Quebec*, supra note 15, p. 32-35; OMAF, *On-Farm Food Safety Strategy for Ontario, Background Paper Working Group 5: Traceability*, supra note 99, p. 9.

¹²⁷ OMAF, *Traceability Working Group 5: Final Progress Report* (19 April 2004), available from http://www.gov.on.ca/OMAFRA/english/offss/facts/prog_gr5.htm [accessed 3 June 2004].

¹²⁸ OMAF, *On-Farm Food Safety Programs in Ontario, Discussion Paper* (March 2002), available from <http://www.gov.on.ca/OMAFRA/english/offss/facts/background.htm> [accessed 3 June 2004].

OMAF is also playing an important role in facilitating the retirement of tags under the CCIA program. The obligation to retire tags placed on abattoirs is an onerous one, particularly on small and medium enterprises.¹²⁹ In order to assist smaller abattoirs OMAF's meat inspectors have been recording retired identification numbers at small abattoirs, about 87,000 cattle tags each year, and providing them to Beef Improvement Ontario (BIO) which forwards the information to the CCIA. BIO has developed software which enables meat inspectors to electronically communicate retired tag numbers to BIO.¹³⁰

At the present time, there are many different animal identification/traceability initiatives underway led by industry and supported by government.¹³¹

Because of the regular movement of livestock across provincial boundaries, animal identification and tracing systems should be national in scope. Ontario should continue to work with the federal government, other provincial governments and industry to expedite the process of developing a national strategy for traceability which should include traceability across the meat production continuum.

The Expert Advisory Panel has recommended that all sectors of the meat industry develop effective food safety traceability systems and that all commodity groups develop programs for the transfer of relevant animal health and on-farm food safety information that would accompany animals sent from farm to slaughter.¹³² I agree with these recommendations, but I also believe that the provincial government should play a role in working with industry and commodity groups to facilitate the development and implementation of these programs. There is a need to develop a farm to fork traceability system for Ontario which is both effective and affordable.

¹²⁹ *Health of Animals Regulations*, C.R.C., c. 296, ss.186 & 187.

¹³⁰ BIO is a beef industry operator organization actively involved in the development of new animal identification and traceability systems in conjunction with government.

¹³¹ For a good summary of national, provincial and industry led initiatives on traceability in Canada see OMAF, *On-Farm Food Safety Strategy for Ontario, Background Paper Working Group 5: Traceability*, *supra* note 105.

¹³² For example, the Canadian Sheep Federation has developed a voluntary Food-Safe Farm Practices Program which includes detailed shipping records that outline each animal's identification number, medication/animal health products administered and physical residues. See <http://www.cansheep.ca>.

Traceability systems are commonly seen in the distribution and retail sectors where, through the use of bar codes and similar international standards, many products can be readily traced at least back to the point of packaging. However, not all retailers are currently using these labelling systems. This information and ability to trace using timely and accurate information is especially important in food recalls. For example, the recall of meat from Aylmer Meat Packers Inc. in August 2003 was hampered by the lack of a current and accurate list of retail stores who purchased their meat from this plant. As a result, the government agencies could not accurately identify all retail stores who had purchased meat from this operation in order to ensure withdrawal of the meat and to warn the public. Also, because lists were out of date, some retailers who had not purchased meat from this plant for sometime were being incorrectly identified in the public announcements. These problems could easily have been avoided if the information had been kept current.

While industry has taken a lead in developing traceability systems throughout the retail and distribution sectors, there is a need to ensure that the system places a mandatory obligation on all producers, distributors and food premises to maintain accurate information regarding the purchase, distribution and sale of their products. This information must be readily available to authorities with recall powers.

With new technologies and industry support, the ability to develop such a traceability system is achievable. Once the system is developed, the provincial government will need to enact the required legislative and regulatory framework to ensure there is full and mandatory participation in the program. Traceability requires the disclosure of information that is, in part, confidential and proprietary in nature. Legislation will be required to mandate the disclosure of information to facilitate effective traceability. Safeguards should be included to ensure that confidential or proprietary information disclosed to facilitate traceability is otherwise protected and proprietary rights maintained.

I recommend that the provincial government work together with industry and commodity groups as well as the governments of Canada and the other provinces to develop a national strategy for traceability.

I recommend that the provincial government in conjunction with commodity and industry groups develop an effective meat safety traceability system for Ontario designed to allow meat to be traced across the food continuum.

The traceability system for Ontario should include a system which will facilitate the collection and flow of all important information regarding animals, including place and date of birth, all movements, health, medications and feed history.¹³³ I also believe that in the development of a traceability system consideration should be given to a passport or other record-keeping system for each animal or flock to allow the information to follow the animals from the farm of origin to the place of slaughter and subsequent processing.

3.15.8 Premises Identity

Premises identity is an important component of a traceability system, particularly in the event of a disease outbreak, as we have seen recently in British Columbia with Avian Influenza.¹³⁴ For a traceability system to function, all premises holding product need to be identified and recorded. Knowledge of locations and densities of farms in an area is an important tool for epidemiologists to forecast potential outbreaks, track the spread of disease and make timely decisions for appropriate action.

¹³³ *Expert Advisory Panel Report, supra* note 1, p. 15-16.

¹³⁴ On March 11, 2004, the federal Minister of Agriculture declared BC's Fraser Valley as a control area to prevent the spread of avian influenza. A high risk region, a 5 km zone and a surveillance region, a further 20 km zone around the initial positive case were also established. Live birds could not be moved outside the control area and biosecurity measures were put into effect. Approximately 19 million birds were depopulated including commercial establishments and backyard flocks. As of June 18, the response shifted to decontamination and surveillance. See CFIA, *Avian Influenza*, available from <http://www.inspection.gc.ca/english/anima/heasan/disemala/avflu/avflue.shtm> [accessed 18 June 2004].

Currently, a comprehensive list of farm and food processing locations does not exist at either the provincial or national level. A number of commodity group initiatives are already underway in Ontario including:

- the Dairy Farmers of Ontario (DFO) has mapped all dairy farms shipping milk. The bulk-tank storage locations have been recorded into a Geographic Information System (GIS)¹³⁵ maintained and used by the DFO to route milk trucks and be available in the event of a disease outbreak.
- the poultry industry (chicken, eggs and turkeys) has all of its producer locations in the province mapped using the Global Positioning System (GPS).¹³⁶ Individual barns are not mapped.
- Ontario Pork recently completed a premises identification project that has recorded GPS coordinates for each hog operation in the province in a database to be used in the event of a Foreign Animal Disease (FAD) outbreak.
- the Ontario Cattlemen's Association has developed a GIS template, which includes mapping pastures and facilities used by Ontario beef cattle. The primary goal is to provide assistance in the event of a FAD outbreak.

Quebec has developed a livestock premises identification system as part of its provincial livestock traceability system, which is coordinated through Agri-Traceability Quebec. The system is voluntary, but there are financial incentives for participating.¹³⁷

At the federal level, the CCIA and others have developed a national template for premises identification in Canada. It would integrate geographically referenced livestock data from multiple sources into a standardized up-to-date model and be accessible to support a national

¹³⁵ GIS involves mapping relevant data using geographic coordinates and software patterns analysis and decision making.

¹³⁶ GPS is a satellite navigation system enabling a receiver to compute their global location.

¹³⁷ OMAF, *On-Farm Food Safety Strategy for Ontario, Background Paper Working Group 5: Traceability*, *supra* note 99.

livestock identification and traceability program as well as all agencies involved in FAD mitigation. The project is awaiting further funding.¹³⁸

The USDA has also recently announced the framework for the implementation of a national animal identification system to identify all premises where livestock are held in the U.S.¹³⁹

As stated earlier, OMAF's Working Group on traceability has recommended the development of a model in order to identify all Ontario farm premises. In Ontario, farm businesses that declare gross farm income of \$7,000 or more are required to register, but many farms are not required to do so.¹⁴⁰ The registration data is not used as part of the traceability system. There are challenges in securing the participation of hobby farmers in a voluntary initiative since these farmers often are not members of the commodity groups and may not be registered as a farm. While the numbers of animals raised on these farms is usually small and, therefore, a lower risk, it remains important to identify them for the purpose of disease surveillance and emergency response. A mandatory registration program for all livestock premises is the only way to ensure all farms are identified.

I recommend that the provincial government in consultation with the federal government and stakeholders support the development of mandatory registration for all livestock farms in Ontario.

3.15.9 Feed Identity

Feed is generally regulated under the *Feeds Act* (Canada).¹⁴¹ Many farmers mix their own feed and the regulations that apply to feed manufacturers apply on-farm with respect to feed safety. One of the most important safety considerations for any feed manufacturer is to be able to trace every ingredient used throughout the manufacturing process. Representative sampling of each incoming ingredient and of each finished feed is crucial to

¹³⁸ *Ibid.*

¹³⁹ *Food Traceability Report* (Vol. 4, Issue 5, 1 May 2004), available from http://www.foodtraceabilityreport.com/ejournals/issues/issue_archive.asp?section=1065 [accessed 3 June 2004].

¹⁴⁰ *Farm Registration and Farm Organizations Funding Act, 1993*, S.O. 1993, c. 21 and O. Reg. 723/93.

¹⁴¹ *Feeds Act*, R.S.C. 1985, c. F-9.

this process. The samples are labelled by origin and date. If a problem develops with a load of feed, the retained sample can be analyzed in a laboratory to determine the cause and to ensure corrective actions are taken. Similar records and retained samples are important on-farm with respect to purchased feed.

On-farm food safety programs should reinforce the need to keep these records.¹⁴² Because the feed fed to livestock can impact the safety of the meat produced, I believe that Ontario's traceability program should include feed. I believe that the provincial government should ensure that feed monitoring is included as part of the traceability system developed for Ontario.

3.16 Biosecurity

Biosecurity is a relatively new concept that is rapidly gaining prominence in any discussion of food safety. Biosecurity measures became prominent as a result of worldwide efforts to prevent the spread of F.M.D. during the outbreak in the U.K. in 2001 and in the aftermath of the September 11, 2001 terrorist attack in the U.S. Biosecurity in food and agriculture encompasses all policy and regulatory frameworks that manage risks associated with food safety,¹⁴³ animal life and health, and plant life and health. Biosecurity applies to food production and addresses the deliberate or inadvertent introduction of pests, diseases and zoonoses.¹⁴⁴

Government has a role in biosecurity by developing a strategic and integrated approach to analyzing and managing these risks.¹⁴⁵ While

¹⁴² For example, the OVQA on-farm food safety program provides a feed inventory form and gives instructions for taking and storing representative samples from different types of feed. By law, every load of manufactured feed must be accompanied by a feed tag, which should be kept in farm records. It is also suggested that samples be kept from premixes and supplements.

¹⁴³ FAO, *Biosecurity in Food and Agriculture: Scope and Relevance, Report of the Expert Consultation on Biosecurity in Food and Agriculture*, TC/BRM 03/02, (Rome, 10-13 September 2002).

¹⁴⁴ A. Torres, *A New International Theme: "Biosecurity" in Food and Agriculture Discussions at the FAO* (2003), available from <http://www.animalagriculture.org/Proceedings/203%20Proc/Torres.htm> [accessed 15 June 2004].

¹⁴⁵ FAO, *Introduction to Biosecurity*, available from <http://www.fao.org/biosecurity/> [accessed 15 June 2004].

biosecurity measures are necessary to protect agriculture, the food industry and the environment, they also play an important role in protecting human health and consumer confidence in food.¹⁴⁶ Biosecurity programs will benefit producers in terms of healthier animals, improved animal welfare and well-being, and improved efficiency and profitability.¹⁴⁷ Government also has an important responsibility to provide timely information and advice to producers regarding actions to be taken in the event of a disease outbreak.

Biosecurity measures are implemented at different levels. At the local level, herd biosecurity is undertaken by the herd owner to try to exclude any disease that is not already present in the herd or limit the spread of disease within the herd.¹⁴⁸ To be successful, herd biosecurity plans should address how groups of animals will be isolated from others, how the movement of people, animals and equipment will be regulated to avoid disease transmission and how cleaning and disinfection procedures will be used to reduce pathogen levels.¹⁴⁹ Examples of herd biosecurity measures include animal vaccinations, nutrient management, controlling and limiting livestock movement, visitor control, and sanitation of clothing, boots, equipment and vehicles.¹⁵⁰

Biosecurity measures may also be taken at the national and provincial levels. Australia and New Zealand were among the first countries to establish national programs on biosecurity.¹⁵¹ Biosecurity measures go hand in hand with good traceability and surveillance systems as they are also designed to provide early detection and isolation and/or zoning of disease to minimize its impact.

¹⁴⁶FAO, Committee on Agriculture, *Biosecurity in Food and Agriculture*, 17th Sess., (Rome, 31 March –4 April 2003), p. 2, available from <http://www.fao.org/DOCREP/MEETING/006/Y8453E.HTM> [accessed 15 June 2004].

¹⁴⁷G. Bowman & W. Shulaw, *Biosecurity Fundamentals for Extension Personnel* (Ohio State University, 2001), available from <http://www.gov.on.ca/OMAFRA/english/livestock/biosecurity/facts/extension.htm> [accessed 3 June 2004].

¹⁴⁸*Ibid.*

¹⁴⁹*Ibid.*

¹⁵⁰J. Dalrymple & P. Innes, OMAF, *Biosecurity Fundamentals for Visitors to Livestock Facilities* (February 2004), available from <http://www.gov.on.ca/OMAFRA/english/livestock/vet/facts/04-003.htm> [accessed 4 May 2004].

¹⁵¹FAO, *Toward Biosecurity*, Agriculture 21, available from <http://www.fao.org/ag/magazine/0103sp1.htm> [accessed 26 May 2004].

In the U.S., biosecurity of the food supply has become a significant issue, partly as a result of the recent concern over bioterrorism. The FSIS has developed a plan and infrastructure to address biosecurity issues in order to protect food production, processing, storage and distribution, to respond to threats against the agricultural sector and to address the risk of outbreaks of foodborne illness.¹⁵²

In Canada, the CFIA has developed strategies to address biosecurity and to promote the security of Canada's food supply.¹⁵³ In addition, the CFIA is addressing emergency preparedness to achieve a state of readiness to ensure an effective and rapid response to food safety, animal food safety or animal disease emergencies.¹⁵⁴ These strategies were in operation during the course of the Review in responding to the outbreak of Avian Influenza in poultry flocks in British Columbia.

It is important for Ontario to do its part to promote biosecurity. This should include working with commodity groups to develop and implement on-farm biosecurity plans and ensuring that timely communication links to producers are in place. Many industry and commodity groups currently have or are developing biosecurity plans and measures. On-farm biosecurity should be a component of on-farm food safety programs.

In the development of a biosecurity plan, it is important to address the biosecurity risk associated with government inspectors, auditors, investigators and veterinarians who are required to enter farms and plants. Biosecurity plans must not interfere with their ability to perform their regulatory functions, however, government personnel should be properly trained in biosecurity measures and equipped to ensure that the risk of cross-contamination is minimized.

Biosecurity plans are also required at other stages of food production and need to be incorporated into all HACCP-based food safety programs. The

¹⁵² USDA, FSIS, *Biosecurity and the Food Supply* (June 2002), available from <http://www.fsis.usda.gov/OA/background/biosecurity.htm> [accessed 26 May 2004].

¹⁵³ CFIA, *Corporate Business Plan 2003-2008*, available from <http://www.inspection.gc.ca/english/corpaffr/busplan/2003-2008/indexe.shtml> [accessed 3 June 2004].

¹⁵⁴ *Ibid.*, p. 22-29.

provincial government should work with industry groups to develop and implement these measures throughout the food continuum.

I recommend that the provincial government develop a biosecurity strategy and plan for livestock, poultry and meat products in Ontario. The provincial government should work with industry and commodity groups in the development of an overall biosecurity strategy for Ontario.

Ontario should also be part of a national biosecurity strategy. This strategy should encompass all aspects of biosecurity throughout the meat production continuum.

I recommend that the provincial government work in cooperation with the federal government, including the Canadian Food Inspection Agency, and other provincial governments to develop a national biosecurity strategy. This strategy should encompass all aspects of biosecurity throughout the meat production continuum.

3.17 Surveillance

3.17.1 Introduction

The surveillance of foodborne disease is an important component of any food safety program. In the context of public health, surveillance is the ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in reducing morbidity and mortality and improving health.¹⁵⁵ Foodborne disease surveillance has a number of important purposes including:

- enabling prompt control measures for foodborne diseases and outbreaks;
- monitoring and interpreting trends in foodborne disease to assist in the design of preventative measures, educational activities and HACCP-based systems and to prepare risk assessments;

¹⁵⁵ U.S., CDC, *Guidelines for Evaluating Surveillance Systems*, Morbidity and Mortality Weekly Reports (Vol. 37, No. S-5, 6 May 1988); and *Updated Guidelines for Evaluating Public Health Surveillance Systems*, Morbidity and Mortality Weekly Reports (Vol. 50, No. RR13, 27 July 2001), available from <http://www.cdc.gov/mmwr/index.html> [accessed 31 May 2004].

- measuring the burden of foodborne disease including the identification of populations at high risk, identification of new or emerging health concerns;
- estimating health and economic impacts of foodborne disease;
- evaluating the effectiveness of foodborne disease and prevention and control measures and strategies;
- identifying priorities and setting policy in the control and prevention of foodborne disease;
- guiding the planning, implementation, and evaluation of programs to prevent and control foodborne disease including emergency preparedness; and
- providing the basis for epidemiological research including the identification of emerging problems and the focusing of research in areas of high risk.¹⁵⁶

The World Health Assembly, in 2000, adopted a resolution recognizing that food safety is an essential public health function and encouraging member countries “*to implement and keep national, and when appropriate, regional mechanisms for foodborne disease surveillance.*”¹⁵⁷

In the context of meat, foodborne disease surveillance has three distinct components:

- animal health surveillance;
- food hazard surveillance; and
- foodborne illness surveillance.

A good foodborne disease surveillance system requires that all three components be linked to each other. When integrated and reviewed on a regular basis, the data obtained from these three surveillance systems can

¹⁵⁶ *Ibid.*, CDC, *Updated Guidelines for Evaluating Public Health Surveillance Systems*, p. 4; FAO/WHO, Global Form of Food Safety Regulators, January 2002, Conference Room Document Proposed by the WHO, GF/CRD WHO-2, <http://www.fao.org/DOCREP/MEETING/004/AC114EHTM>; OMAF, *Ontario Food Safety Strategy - Surveillance Component Team Report* (November 1998).

¹⁵⁷ WHO, WHA Res. 53.15, 53rd World Health Assembly (20 May 2000).

provide useful insights into the sources and pathways of pathogens in the food chain.¹⁵⁸

Surveillance systems may be classified as being passive or active. Passive systems rely upon reporting of notifiable diseases on a case-by-case basis by laboratories and veterinarians in respect of animals and by physicians in respect of humans. These systems are efficient for tracking disease over a period of time, but reporting is often incomplete and may not allow an outbreak to be promptly identified or disclose the true incidence of the outbreak.¹⁵⁹ Active surveillance, on the other hand, involves regular outreach for information to identify and obtain data in respect to specific conditions. A comprehensive system requires both active and passive surveillance.¹⁶⁰

3.17.2 Animal Health Surveillance

Surveillance of animal health is increasingly important to food safety and public health. At the farm, the main focus is on the ability to detect zoonotic animal diseases, which can enter the food chain and cause foodborne illness to humans. Once the diseased animal is identified, it can be properly treated or removed from the food chain altogether. Disease surveillance is crucial for HACCP programs to help identify CCPs and to evaluate the success of the program in reducing pathogens.

Both the federal and provincial governments have important roles to play in animal disease surveillance. To be effective, they need to collaborate in their surveillance efforts.

The CFIA's Animal Disease Surveillance Unit (ADSU) is responsible for animal disease surveillance at the federal level and also to ensure that

¹⁵⁸ *Expert Advisory Panel Report, supra* note 1, p. 52.

¹⁵⁹ OMAF, *Ontario Food Safety Strategy - Surveillance Component Team Report, supra* note 156, p. 3.

¹⁶⁰ Organization for Economic Cooperation and Development, Directorate for Food, Agriculture and Fisheries, *The Incidence and Cause of Foodborne Illness*, AGRI/CA/APM (2002) 28/Final (10 September 2003).

Canada has current knowledge of international developments in animal disease outbreaks, surveillance methods and identification approaches.¹⁶¹

The CFIA's laboratories are responsible under the *Health of Animals Act* for the detection, research, and scientific advice for diseases exotic to Canada and some indigenous disease that are of national or public health significance.¹⁶² Animal disease surveillance is undertaken utilizing a nationwide network known as the Canadian Animal Health Network (CAHNet). CAHNet is a partnership including representatives of federal, provincial and territorial veterinary services, diagnostic laboratories,¹⁶³ veterinary colleges, veterinary practitioners, producer organizations and wildlife interest groups.¹⁶⁴ CAHNet's role includes educating producers and practitioners of the need to report animal disease problems.

The ADSU and CAHNet are expected to facilitate a timely method of distribution of animal health related information across Canada and internationally, with the Office International des Epizooties (OIE).¹⁶⁵

In Ontario, animal health surveillance is undertaken by OMAF through the Ontario Animal Health Surveillance Network (OAHSN). OAHSN comprises a network of professionals of veterinary science, animal health, food inspection and extension education. The OAHSN monitors a range of surveillance data, generated largely by veterinarians sending in samples from farm animals, animals rejected at sales barns and animals identified at abattoirs. The Animal Health Laboratory at the University of Guelph in Ontario generates surveillance data and the OAHSN monitors the data for unusual trends. OAHSN also monitors the number of a species collected by deadstock collectors in Ontario for unusual trends.

¹⁶¹ CFIA, *Animal Disease Surveillance*, available from <http://www.inspection.gc.ca/english/anima/surv/surve.shtml> [accessed 15 June 2004].

¹⁶² *Expert Advisory Panel Report*, *supra* note 1, p. 55.

¹⁶³ Health Canada has health of animals laboratories at 16 sites across Canada including Guelph.

¹⁶⁴ Canadian Animal Health Network, *About Us: CAHNet in General*, available from <http://www.cahnet.org/general.htm> [accessed 15 June 2004].

¹⁶⁵ The OIE is an intergovernmental organization which was created in 1924. The OIE collects and analyses animal disease information and distributes it to member countries. See http://www.oie.int/eng/en_index.htm.

In addition, several commodity groups have established specific surveillance programs, often in collaboration with OMAF. For example, OAHSN is linked to the Ontario Swine Health Information Plan run by OMAF for 32 swine breeding herds. Under the plan, a minimum of four herd-health visits are conducted per year by OMAF veterinarians and private practitioners. Quantitative assessments of biosecurity, health, medications and vaccinations are conducted.¹⁶⁶

This initiative and others illustrate how coordinated and integrated programs can be delivered on-farm. OMAF, in collaboration with all commodity groups, should be encouraged to develop specific disease surveillance programs.

It is important for Ontario to have an effective animal health surveillance system that is appropriately integrated with the surveillance systems monitoring food hazards and foodborne illnesses. The provincial government should collaborate with the federal government, CFIA and the other provinces to develop a national strategy and program for animal health surveillance. In order to ensure that the animal health surveillance system is functioning properly and to ensure that it is properly integrated with the provincial foodborne disease surveillance, I believe that it should be overseen by a Chief Veterinarian of Ontario (CVO) whose role and responsibilities I will outline later in my Report.

3.17.3 Food Hazard Surveillance

Another essential component of an effective foodborne disease surveillance system involves the surveillance of the food product itself. In the context of meat, this includes surveillance of laboratory testing of foodborne pathogens, drug and other chemical residues.

3.17.3.1 Abattoirs and Meat Processors

In Ontario, OMAF undertakes a variety of programs for foodborne hazard surveillance in provincially licensed abattoirs. There are over 50 testing

¹⁶⁶ OMAF, Ontario Animal Health Surveillance Network, *Surveillance Coverage of Livestock Populations at Risk*, available from <http://www.gov.on.ca/OMAFRA/english/research/oahsn/ahsn4.html#Swine> [accessed June 16, 2004].

projects included in OMAF's meat inspection program.¹⁶⁷ These testing projects target such things as microbiological hazards, antimicrobial residues, pesticides, heavy metals, anabolic hormones, water and ice, microbiological quality, histopathology of meat inspection specimens, parasitology, and BSE surveillance testing.¹⁶⁸

The laboratory testing projects which form part of OMAF's meat inspection program may be categorized into three groups: surveillance projects, monitoring projects and baseline studies and pathogen monitoring projects. Surveillance projects address high risk issues such as non-ambulatory animals, antibiotic residue testing and testing for sulphha drugs in barbeque pigs. In these projects, the carcasses are held until the test results are received and reviewed by a scientist. Monitoring projects are conducted using a random sampling plan and are designed to ascertain the level of risk associated with normal animals presented for slaughter for a particular substance. The carcasses are not held. The results of the testing are subjected to statistical analysis. Baseline studies and pathogen monitoring projects are designed to determine the levels of selected microbial pathogens and indicator organisms in carcasses of selected species. These projects also involve ready-to-eat meats produced from secondary processing. Carcasses and meat products are not held. The results of the testing are analyzed and used to establish performance standards which are used to measure operator performance.¹⁶⁹

I was advised during the course of the Review that the funding for ongoing BSE and water testing to the levels recommended in the policies was not sufficient in the last two years.

I recommend that the provincial government provide necessary resources to ensure that disease surveillance, testing and reporting continue to the levels set out in the existing policies year round.

¹⁶⁷ OMAF, *Meat Inspection Policy and Procedure Manual* (Revised, 1 June 2003).

¹⁶⁸ *Ibid.*; *Expert Advisory Panel Report*, *supra* note 1, p.58

¹⁶⁹ OMAF, *Meat Inspection Policy & Procedure Manual*, *supra* note 167, Section 08.00-Laboratory Testing.

The Food Safety Decision Support System (FSDSS) is the computer system used by OMAF to support its food inspection program including laboratory services and surveillance. In the area of testing and surveillance, the system has been designed to provide timely exchange of testing information and data as between the food inspection program and the laboratory. During the Review, I learned that meat inspectors who submit test samples are not given access to test results even though they are available in the FSDSS. It is important that meat inspectors have access to the results of all testing done at plants under their inspection through the FSDSS. This information will assist inspectors in their work and help them assess a plant's overall performance.

I recommend that the Ministry of Agriculture and Food ensure that on-site meat inspectors have access to the results of testing through the Food Safety Decision Support System.

On balance, it appears that the FSDSS system is a good one and, with appropriate ongoing upgrades, training and support, it will continue to improve the inspection services provided by OMAF.

At the present time, meat processors who do not engage in animal slaughter are not subject to the same type of testing and surveillance programs undertaken in provincially licensed abattoirs. This is not acceptable and needs to be corrected as food hazard surveillance is as important at free standing meat processors as it is at abattoirs.

3.17.3.2 Meat Retail and Distribution

At the present time, food retailers and distributors are subject to inspections by public health inspectors pursuant to the *Health Protection and Promotion Act (HPPA)* unless these operations are part of licensed abattoirs. Public health inspectors from Boards of Health are primarily responsible for undertaking testing in support of their food safety programs.¹⁷⁰ In general, the laboratory testing of food premises falls into these categories:

- illness and outbreak investigations where sampling of contaminated surfaces, food or other samples are taken by the inspector during

¹⁷⁰ *Expert Advisory Panel Report, supra* note 1, p.56.

investigation and matched with clinical samples from the affected individuals with a view to providing an epidemiological link;

- audit of food in high-risk food premises where environmental and food samples are collected on the basis of a risk assessment process that prioritizes premises based on various factors;
- special surveys done at the request of MOHLTC targeting specific products or premises as part of larger province-wide studies; and
- seizures where an inspector will seize and hold a product suspected to be a health hazard to the public and samples are taken to confirm the risk.¹⁷¹

It is difficult to facilitate any type of coordinated surveillance, given the involvement of 37 individual Boards of Health. For that reason, the MOHLTC must play an important role in developing and implementing a clear strategy with respect to surveillance of foodborne hazards in food premises currently under the inspection of Boards of Health. The MOHLTC does not appear to have a clear publicly articulated strategy for its surveillance programs. This, at least in part, appears to be due to the lack of direction and resources within the Public Health Branch of MOHLTC. I will outline the problems which I have identified within the Public Health Branch of the MOHLTC in Chapter 9.

From the information provided to the Review by the public health units and a review of the mandatory programs and guidelines set by the MOHLTC, it is clear that there is no standard testing program in place across the province for meat products at food premises. Testing varies across the province: some Boards of Health conduct random sample testing of food products;¹⁷² others conduct testing during HACCP audits; others conduct testing of specific meats;¹⁷³ and there are some that conduct no testing of any meat products.

¹⁷¹ *Expert Advisory Panel Report, supra* note 1, p.57.

¹⁷² During foodborne illness outbreaks, foodborne illness investigations or in response to public complaints.

¹⁷³ Health units identified dried meats and ready -to-eat sausages as products which are randomly tested.

3.17.4 Foodborne Illness Surveillance

The recognition of a change in the distribution of illness is an essential part of any program for the control of outbreaks of illness.¹⁷⁴ The Pennington Group in its report investigating an outbreak of *E. coli* O157:H7 in Scotland describes the importance of a surveillance program in the following way:

*The best surveillance system in the world cannot prevent outbreaks. However, early identification of an outbreak is an important element in aiding the investigation and management of the outbreak and in helping to ensure that it can be brought under control as swiftly as possible. Surveillance can help inform appropriate research and aid understanding of the epidemiology of infection, leading to improvements in the understanding of the organisms involved, the factors influencing outbreaks and the spread of infection and the most appropriate means to manage and control future outbreaks. In addition, sound surveillance data can inform policy decisions and form the basis for legislative change.*¹⁷⁵

At the federal level, Health Canada has established a number of initiatives to undertake foodborne illness surveillance. The Canadian Enteric Outbreak Surveillance Centre (CEOSC) was established to enable public health professionals across the country to have quick and efficient access to enteric outbreak information. CEOSC allows outbreak information to be shared confidentially by health officials at various levels of government.¹⁷⁶

In addition to this passive surveillance program, Health Canada is also involved in an active surveillance program, namely, the National Studies on Acute Gastrointestinal Illness which involves a study of enteric disease by surveying the general population, physicians, laboratories and public health authorities.¹⁷⁷

¹⁷⁴ The Pennington Group, *Report on the circumstances leading to the 1996 outbreak of infection with E. coli O157:H7 in Central Scotland, the implications for food safety and the lessons to be learned* (Scottish Office, 1998), Ch. 10, available from <http://www.scotland.gov.uk/deleted/library/documents-w4/pgr-00.htm> [accessed 4 June 2004].

¹⁷⁵ *Ibid.*

¹⁷⁶ *Expert Advisory Panel Report*, *supra* note 1, p.64-65.

¹⁷⁷ Health Canada, National Studies on Acute Gastrointestinal Illness, *Background*, available from http://www.hc-sc.gc.ca/pphb-dqsp/psp/nsagi-enmga/info_e.html [accessed 29 April 2004].

Recognizing that there are gaps in Canada's health surveillance systems, Health Canada also created the Canadian Integrated Public Health Surveillance (CIPHS) program as a strategic alliance of public health and information technology professionals designed to create an integrated, easy to use system which would allow for the capture, integration and forwarding of data by front-line health care workers in the course of their regular duties.¹⁷⁸ CIPHS has the potential to improve public health coordination by standardizing processes and the collection of information used by public health workers, laboratory workers and epidemiologists.¹⁷⁹

One component of CIPHS is the Public Health Information System (i-PHIS). i-PHIS is designed to be an automated, integrated client health record and reporting system that will support public health provider interventions, tracking, follow-up, case management and reporting. i-PHIS includes case management and surveillance components and is designed to be used centrally, providing secure access to one record by multiple public health providers and programs and allowing communicable disease surveillance and immunization information to be shared. It has been designed to be used by all levels of government and public health authorities. Ontario is in the process of implementing i-PHIS which is expected to be complete by the fall 2004.¹⁸⁰ It is important for Ontario to complete the implementation of i-PHIS as planned.

In addition to the programs outlined, Health Canada has many other programs and initiatives to address health surveillance.¹⁸¹ In May 2004, the federal government announced the creation of the new Public Health Agency of Canada and the International Centre for Infectious Diseases

¹⁷⁸ *Expert Advisory Panel Report, supra* note 1, p.65; Health Canada, Centre for Surveillance Coordination, *Canadian Integrated Public Health Surveillance*, available from http://www.hc-sc.gc.ca/pphb-dqsp/csc-ccs/ciphs_e.html [accessed 15 June 2004].

¹⁷⁹ *Ibid.* p.2.

¹⁸⁰ MOHLTC, *Public Health Renewal in Ontario, Backgrounder*, available from <http://ogov.newswire.ca/ontario/GPOE/2004/04/20/c3159.html?lmatch=&lang=e.html> [accessed 15 June 2004].

¹⁸¹ These programs are under the direction of the Population Public Health Branch (PPHB), Division of Disease Surveillance Centre for Infectious Disease Prevention and Control (See <http://www.hc-sc.gc.ca/pph>) and are undertaken through the Centre for Surveillance Coordination and the Network for Health Surveillance in Canada. See http://www.hc-sc.gc.ca/pphb-dqsp/csc-ccs/network_e.html.

together with a plan to strengthen the country's public health system. Included in the announcement was a promise of \$100 million of funding for improved surveillance systems and other significant funding for public health.¹⁸² It is important for the Province of Ontario to take advantage of opportunities which may arise from these new federal initiatives and to ensure that Ontario coordinates its surveillance activities with the federal programs.

Canada also participates in an early warning system for outbreaks of foodborne disease called PulseNet. PulseNet is a national network of U.S. and Canadian public health laboratories that performs DNA fingerprinting on bacteria that may be foodborne. This network identifies and labels each fingerprint pattern and permits rapid comparison through an electronic database at the CDC to identify the strain and to make epidemiological linkages to other reported outbreaks. PulseNet Canada is the Canadian network which is coordinated by the National Microbiological Laboratory (Health Canada) in Winnipeg and is linked to most federal and provincial laboratories including the Ontario Public Health Laboratory.¹⁸³

In Ontario, the MOHLTC and the Boards of Health are responsible to assess the level of foodborne illness. In order to do so, they should be identifying, measuring and tracking illnesses, analyzing the information for trends, responding to outbreaks, investigating potential hazards and outbreaks, and attempting to design their programs and services to prevent foodborne illnesses based on this information.

The *HPPA* requires all practitioners under the *Regulated Health Professions Act, 1991*¹⁸⁴ as well as hospital administrators, superintendents of institutions, school principals and laboratories to notify the local medical officer of health where a person has or may have a reportable disease. Reportable diseases are defined in the *Specification of Reportable Diseases*

¹⁸² Health Canada, News Release, *Government of Canada announces details of new Public Health Agency of Canada and appoints Acting Chief Public Health Officer* (17 May 2004), available from http://www.hc-sc.gc.ca/english/pha/releases/2004_26.html [accessed 18 June 2004].

¹⁸³ *Expert Advisory Panel Report*, *supra* note 1, p. 65-66; U.S., CDC, *What is PulseNet?*, available from http://www.cdc.gov/pulsenet/what_is.htm [accessed 16 June 2004].

¹⁸⁴ *Regulated Health Professions Act, 1991*, S.O. 1991, c. 18.

regulation and include illnesses caused by common foodborne pathogens such as *Campylobacter*, *Salmonella* and *E. coli* and all food poisonings.¹⁸⁵

As noted earlier, surveillance of foodborne illness based on reported cases has inherent weakness due to significant non-reporting or reporting errors. However, compounding the problem in Ontario is the lack of a reliable provincial reportable disease information system. At the present time, all Boards of Health are required to report all confirmed cases of reportable communicable disease to the Public Health Division of the MOHLTC. The current health surveillance software used by the MOHLTC and Boards of Health is the Reportable Disease Information System (RDIS) which was developed in the 1980s and is out of date. There are serious operational deficiencies in RDIS to the extent that all time critical surveillance reports of communicable diseases must be provided to the MOHLTC by telephone, e-mails, letters or faxes.¹⁸⁶

In 2003, the provincial auditor concluded that the RDIS contained data that was not current, changes to the data were not monitored and information such as laboratory slips and school lists, were not being entered by the health units. In short, Ontario does not have an effective system to manage health surveillance data. However, it should be noted that despite the identified weakness of the RDIS, the MOHLTC has attempted to measure the extent of enteric foodborne disease since at least 1997.¹⁸⁷

In the *Interim Report of the SARS Commission* and the *Final Report of the Expert Panel on SARS*, recommendations were recently made to improve and update the software system to ensure that a software program that is efficient and capable of handling foodborne illness data is in place and used by all public health agencies in Ontario to ensure the timely and complete entry and access to data.¹⁸⁸ I would add my support to those

¹⁸⁵ O. Reg. 559/91, s. 1.

¹⁸⁶ *Expert Advisory Panel Report*, *supra* note 1, p. 64.

¹⁸⁷ J. Lim & D. Middleton, MOHLTC, *Enteric Outbreaks Reported in Ontario, 2000-2002*, *supra* note 32; M. Lee, MOHLTC, *Enteric Illness in Ontario, Canada, from 1997 to 2001*, Public Health and Epidemiology Report Ontario (Vol. 14, No. 10, 30 November 2003).

¹⁸⁸ Ontario, *The SARS Commission Interim Report: SARS and Public Health in Ontario* (15 April 2004), principles 3,5 and 20; Ontario, *For the Public's Health: A Plan of Action, Final*

recommendations. Foodborne illness outbreaks can occur at any time and spread rapidly. Without a timely, accessible and universal system across Ontario, future outbreaks could be more severe than those already encountered and have catastrophic impacts on public health and the economy.

3.17.5 Emergency Preparedness

Traceability, biosecurity and surveillance systems are all to a certain extent interrelated. The strength or weakness of one of these systems may very well impact the effectiveness of another. Two important aspects of public health that are very much dependent on their effectiveness are food safety investigations, outbreaks and responses, and emergency preparedness. Food safety investigations, outbreaks and responses will be reviewed in Chapter 9.

Emergency preparedness refers to the need for the food safety system in Ontario to be able to rapidly identify the presence of a threat introduced accidentally or purposefully.¹⁸⁹

Because surveillance is an important component of emergency preparedness, there is a need to ensure that there are linkages between the various food safety surveillance systems undertaken by various levels of government and industry. As outlined earlier, many of these government surveillance systems remain antiquated, under-funded and unable to cross communicate in a real-time fashion.

Under the *Emergency Preparedness Act*,¹⁹⁰ the CFIA's mandate is to prepare for and respond to emergencies involving food safety, animal health or any other situation related to the agency's programs.¹⁹¹ Recently, the federal government announced the creation of a new portfolio, Public Safety and Emergency Preparedness, which includes emergency preparedness, crisis management and national security amongst its functions.

Report of the Ontario Expert Panel on SARS and Infectious Disease Control(April 2004), [also known as the "Walker Panel" or "Walker Report"], recommendations 82,83 and 84.

¹⁸⁹ *Expert Advisory Panel Report*, *supra* note 1, p. 122.

¹⁹⁰ *Emergency Preparedness Act*, R.S.C. 1985, c. 6 (4th Supp.).

¹⁹¹ CFIA, *Corporate Business Plan 2003-2008*, *supra* note 153, p. 28.

In Ontario, emergency preparedness has been addressed, in part, by the creation of the Office of the Commissioner of Emergency Management and the adoption of the Ontario *Emergency Management Act*¹⁹² which has established emergency preparedness standards to be implemented by all municipalities.

Since 2001, the U.S. has significantly increased its emergency preparedness capability. Surveillance systems have been enhanced by the creation of the Food Emergency Response Network (FERN) and the expansion of the Electronic Laboratory Exchange Network (eLEXNET) system. FERN is a network of U.S. federal and state laboratories that are partnered with other U.S. government authorities who are committed to analyze food samples in the event of a biological, chemical or radiological attack.¹⁹³ eLEXNET is an integrated web-based information network that allows health officials in the U.S. and multiple government agencies that engage in food safety activities to compare, share and coordinate laboratory analysis findings. It provides the necessary infrastructure for an early warning system that identifies potentially hazardous foods and enables health authorities to assess risks and analyze trends.¹⁹⁴

In Ontario and across Canada, there is a need to implement these types of emergency preparedness strategies with a seamless and coordinated approach. The Expert Advisory Panel has made a number of recommendations to address these weaknesses in our current surveillance systems including:

- establishing an Ontario Food Safety Reporting Centre (OFSRC). This centre would be responsible for coordinating all matters relating to food safety reporting in the province. The OFSRC would report to the Chief Medical Officer of Health (CMOH) for the

¹⁹² *Emergency Management Act*, R.S.O. 1990, c. E.9.

¹⁹³ U.S. Food and Drug Administration, *Ensuring the Safety and Security of the Nation's Food Supply: Progress Report to Secretary Tommy G. Thompson* (23 July 2003), available from <http://www.cfsan.fda.gov/~dms/fssrep.html> [accessed 10 June 2004]; and *Statement of Lester M. Crawford, D.V.M., Ph.D., Deputy Commissioner, Food and Drug Administration* (19 November 2003), available from <http://www.fda.gov/ola/2003/counterterrorism1119.html> [accessed 10 June 2004].

¹⁹⁴ See <http://www.elexnet.com>.

province of Ontario. All Ministries in the province that have responsibilities in food safety (OMAF, MOHLTC and MNR) would be required to report any data, issues and concerns to the OFSRC. The OFSRC would be equipped with the technology and resources to provide real-time reporting from multiple jurisdictions and analytical and GIS mapping capability. This centre would provide early warning and coordination to ensure rapid investigation of threats and unusual occurrences in Ontario, risk communication with the public and provide linkages to federal authorities.

- implementing electronic submission and reporting forms for the food safety investigation samples submitted by public health inspectors that would be comparable to the electronic system currently in use by the meat inspection program.
- implementing the eLEXNET system (or a comparable system) in all federal, provincial and private food laboratories in Ontario. This type of system can extract and integrate data from differing reporting systems.
- carrying out a review to determine whether the capacity of the current level 3 containment facilities is adequate to support investigations into emerging pathogens and other sources of foodborne illness and funding the necessary enhancement.
- expanding the province's capacity to conduct testing and research on the causes of foodborne illnesses and on prion related zoonotic diseases such as BSE.¹⁹⁵

For the reasons set out by the Expert Advisory Panel, I believe these recommendations are sound and if implemented would improve food safety in Ontario.

¹⁹⁵ *Expert Advisory Panel Report, supra note 1, p. 123-124.*

3.17.6 Conclusions and Recommendations

In summarizing its review of Ontario's provincial surveillance system, the Expert Advisory Panel states:

High-quality surveillance is critical in order to identify foodborne disease trends and emerging problems, identify and minimize the impact of outbreaks, prevent spread to larger populations, and to plan and evaluate food safety programs (e.g. HACCP, inspector and food handler training programs). In addition to surveillance of foodborne diseases, there is continued need for surveillance of hazards throughout the food chain through ongoing monitoring, as well as periodic baseline or targeted studies. These data should support risk analysis and be used to develop food safety criteria. The current foodborne disease surveillance system is fragmented and relies on outdated methodologies. There is need for improved foodborne disease reporting, more resources for timely data analysis, interpretation and dissemination to those that need to know (e.g. enhanced computer systems, new technologies, more epidemiological expertise), and for better coordination among responsible officials at the provincial level, and among provincial and federal partners in foodborne disease control.¹⁹⁶

I agree with these comments. The goal of the Ontario food safety system must be to protect human health. The protection of human health is the core responsibility of the public health system in Ontario and at the head of that system, the CMOH. Later in this report I will outline my recommendation for a CVO whose responsibilities will include overseeing animal health and foodborne hazards surveillance in abattoirs and free standing meat processors. The CMOH should work closely with the CVO to ensure that all provincial surveillance systems for animal health, foodborne hazards and foodborne illness are properly integrated and coordinated to ensure that there is a timely exchange of information and analysis and that the system can supply data to support and evaluate HACCP-based programs and risk-based resource allocation. The food safety system must be informed by its

¹⁹⁶ *Ibid.*, p. 142-143.

risks. The risks cannot be known unless there is a strong surveillance system with communication and coordination of the surveillance data amongst the parties involved in food safety.

I recommend that the provincial government undertake a review to ensure that Ontario has effective surveillance strategies and programs for animal health, food hazards and foodborne illnesses in a system that is integrated, transparent, properly resourced and coordinated with national surveillance programs.

I recommend that the Ministry of Health and Long-Term Care expedite the implementation of a system such as the Integrated Public Health Information System (iPHIS), to track all foodborne illnesses across the province and permit access and analysis of the data, by all Boards of Health in the province.

I recommend that the provincial government establish an Ontario Food Safety Reporting Centre to be responsible for the coordination of all matters relating to food safety in the province.

I recommend that the provincial government implement a system such as the Electronic Laboratory Exchange Network (eLEXNET) system in provincial and private food laboratories in Ontario to permit the extraction and integration of data from different reporting systems.

I recommend that the provincial government undertake a review to ensure that Ontario has level three containment facilities that are capable of supporting investigations into emerging pathogens and other foodborne illnesses.

I recommend that the Ministry of Health and Long-Term Care develop a standard food safety testing policy and procedure for the Boards of Health which should form part of the Mandatory Health Programs and Services Guidelines.

I recommend that the provincial government review its capacity to conduct testing and research of the causes of foodborne illnesses and or prion related zoonotic diseases such as bovine spongiform

encephalopathy (BSE) and expand its capacity as necessary based on the outcome of that review.

The MOHLTC should provide laboratory support for this testing, and ensure that the results of the tests are analyzed and used in the planning, development and revision of programs and services regarding meat safety and a reduction of foodborne illness.

I recommend that the Ministry of Health and Long-Term Care develop and implement a system of electronic submission and reporting forms for the food safety investigation samples submitted by public health inspectors.

The system should be comparable to the electronic submission system currently in place for the meat inspectorate of OMAF's Food Inspection Division.

3.18 Microbiological Standards for Meat

Science enables standards to be developed which can be used to improve the safety of the food that we consume. Microbiological testing is an important scientific tool used to determine these standards. While microbiological testing of finished products for pathogens will assess the safety of finished products, it is limited in its effectiveness.¹⁹⁷ The primary benefits of testing relate to surveillance, HACCP verification and validation, and re-validation of control procedures. In order to make microbiological testing useful, it is important that microbiological criterion and performance standards be determined.

Microbiological criteria and standards for food define the acceptability of a specific food by setting the limits for the presence or number of specific micro-organisms, or quantity of their toxins, per unit of mass, volume or area.¹⁹⁸ The standard should describe the food to which it applies, the level of the food chain where it applies and any actions to be taken when the

¹⁹⁷ Codex Alimentarius Commission, *Principles for the Establishment and Application of Microbiological Criteria for Foods*, CAC/GL-21 (1997), p. 1 & 2.

¹⁹⁸ *Ibid.*, p. 2.

standard is not met.¹⁹⁹ Governments in both the U.S. and U.K. have established advisory committees to provide advice on microbiological safety issues including the development of microbiological criterion and standards.²⁰⁰ The Province of Ontario does not have a similar advisory committee.

In the U.S., the establishment of microbiological performance standards began with a pathogen reduction program and the Final Rule. FSIS has completed baseline studies that are used to determine performance standards and measure performance.²⁰¹

At the federal level, both Health Canada and the CFIA are developing performance standards for meat and poultry based on results of risk assessments and the level of contamination of the carcass.²⁰² Health Canada's Food Directorate is responsible for establishing policies, setting standards and providing advice and information on the safety and nutritional values of food including policies and standards related to chemical and microbiological contaminants of foods.

OMAF has completed a number of baseline studies of microbiological contamination in raw beef, pork and chicken and also chemical contamination due to veterinarian drug residues in raw meats in provincially inspected plants. Baseline studies have also been completed for some fish species. OMAF is planning to undertake additional studies related to the

¹⁹⁹ *Ibid.*, p. 2; Health Canada, *Food Program Guideline Concerning Microbiological Criteria* (April 1998), p. 5, available from http://www.hc-sc.gc.ca/food-aliment/mh-dm/mhe-dme/compendium/volume_1/pdf/e_guidance.pdf [accessed 6 June 2004].

²⁰⁰ In the U.S., the national Advisory Committee on Microbiological Criteria for Foods was established in 1988 and is co-sponsored by a number of organizations including FSIS, FDA and CDC. In the U.K., the Advisory Committee on Microbiological Safety of Food (ACMSF) was formed in 1990 as a statutory committee to provide independent expert advice to the government on questions relating to microbes in food. It provides advice to the government and the Food Standards Agency on questions relating to microbes in food.

²⁰¹ Under FSIS, the Office of Public Health Science collects, analyzes and reports scientific information related to meat, poultry and egg products from farm to table and uses the information. See P. Johnson et al., OMAF, *Overview of Microbiological Baseline Studies of Raw Pork, Beef and Chicken Carcasses in Ontario Abattoirs* (2003), available from http://www.aic.ca/aicf/conference/Pat_Johnson.pdf [accessed 6 June 2004].

²⁰² Health Canada, Food Directorate, *First Annual Report on Program Priorities & Achievements, 2003-2004*, *supra* note 20; CFIA, *2002-2003 Annual Report*, available from <http://www.inspection.gc.ca/english/corpaffr/ar/ar03/ar03e.shtml> [accessed 9 June 2004].

microbiological quality of ready-to-eat meats and environmental chemical residues. Baseline studies provide important data that can be used to:

- assess the level of food safety risk;
- develop performance standards for meat coming from provincially inspected plants;
- measure the impact of regulatory and non-regulatory programs post-implementation;
- target and prioritize resources ;
- examine operational variables in plants across Ontario, eg. plant practices, processing rates; and
- undertake performance comparison between provincially inspected plants and federally inspected plants and with other jurisdictions.²⁰³

Some of the results of OMAF's baseline studies are set out in the tables below:

Table - Prevalence of Pathogens on Pork Carcasses from Provincially Inspected Abattoirs in Ontario²⁰⁴

Organism	All samples		BBQ Hogs		Market Hogs	
	No. of samples	% +ve	Nov. of samples	% +ve	No. of samples	% +ve
<i>E. coli</i> ^d	1557	39.5	168	49.4	1389	38.3
<i>Verotoxigenic E. coli</i>	1556	2.1	168	1.2	1388	2.2
<i>Salmonella</i>	1540	4.8	168	17.5	1374	3.3
<i>Campylobacter jejuni/coli</i>	1556	26.7	168	33.3	1388	25.9
<i>Listeria monocytogenes</i>	1556	10.7	168	4.8	1388	11.4

²⁰³ See the following studies from the OMAF: *Microbiological Baseline Survey of Raw Beef Carcasses in Ontario Abattoirs* (2001); *OMAF & CFIA Chemical Residue Monitoring Program, Comparison of Chickens* (undated); *Baseline Risk Study of Chemical Contaminants in Raw Meats Processed in Ontario's Provincially Licensed Plants* (April 2002); *Microbiological Analysis of Raw Chicken Carcasses in Ontario Abattoirs* (June 2003); *Microbiological Analysis of Raw Pork Carcasses in Ontario Abattoirs* (January 2003); and *Microbiological Baseline Study for Ready-to-Eat Meats, Draft* (July 2002).

²⁰⁴ P. Johnson et al., OMAF, *Overview of Microbiological Baseline Studies of Raw Pork, Beef and Chicken Carcasses in Ontario Abattoirs*, *supra* note 201.

Table - Prevalence of Pathogens on Beef Carcasses from Provincially Inspected Abattoirs in Ontario²⁰⁵

Organism	All samples		Culled Beef		Fed Beef	
	No. of samples	% +ve	No. of samples	% +ve	No. of samples	% +ve
<i>E. coli</i>	1557	18.6	189	24.9	1239	17.9
<i>Verotoxigenic E. coli</i>	1556	0.3	189	0	1238	0.3
<i>Salmonella</i>	1540	1.6	189	4.2	1239	1.3
<i>Campylobacter jejuni/coli</i>	1556	1.5	186	4.3	1227	1.2
<i>Listeria monocytogenes</i>	1556	9.9	189	7.9	1239	10.2

Table - Prevalence of Pathogens on Chicken Carcasses from Provincially Inspected Abattoirs in Ontario²⁰⁶

Organism	All samples	
	No. of Samples	% +ve
<i>E. coli</i>	1480	99.0
<i>Verotoxigenic E. coli</i>	1468	0
<i>Salmonella</i>	1480	31.6
<i>Campylobacter jejuni/coli</i>	1469	63.9
<i>Listeria monocytogenes</i>	1469	30.0

The studies completed to date have already provided some interesting results. For example, the baseline study on market hogs showed that incidences of *Campylobacter* and *Salmonella* on carcasses processed at provincially licensed plants were at lower levels than those processed in federally registered plants in the U.K. and the U.S. The study also showed that the carcass quality from small plants was as high and in some cases higher than carcasses processed at larger plants. Results from the microbiological analysis of raw chicken carcasses demonstrated that small plants had significantly lower incidences of *Listeria* and *Salmonella* and lower *E. coli* counts than larger plants, but significantly higher incidences of *Campylobacter*. The study also demonstrated that there were differences in the pathogen findings depending on the season and geography. Manual evisceration resulted in significantly lower incidences of *E. coli* and *Salmonella*, but significantly higher incidences of *Campylobacter*. This

²⁰⁵ *Ibid.*

²⁰⁶ *Ibid.*

may explain the difference in the results between larger and smaller plants, since smaller plants tend to use manual evisceration methods.²⁰⁷

Microbiological testing and the development of microbiological performance standards are mandatory and important aspects of both the NMPRC standards as well as any HACCP-based food safety program. Baseline testing in Ontario is important and should continue.

Both the NMPRC standards and HACCP will require an operator to undertake routine testing to demonstrate that their meat satisfies or exceeds these microbiological performance standards. Compliance will be determined by appropriate government verification, auditing and inspection. The expected result will be safer meat.

I recommend that the Ministry of Agriculture and Food complete all baseline studies currently being undertaken and those which are planned. I recommend that the provincial government, at the earliest opportunity, establish mandatory microbiological performance standards and that these standards be enacted by way of regulation and communicated to the industry. Following a reasonable period to enable the operators to achieve compliance, the province should undertake appropriate inspection and auditing to ensure that these standards are being met.

The development of microbiological performance standards and criteria for Ontario should not be done in a vacuum. It would be preferable if these standards were established in conjunction with national standards and a national strategy on microbiological criteria. **I recommend that the provincial government continue its work with the federal government and other provincial governments to establish a national strategy on microbiological food safety and national microbiological performance standards.**

²⁰⁷ OMAF, *Microbiological Analysis of Raw Chicken Carcasses in Ontario Abattoirs*, *supra* note 203.

In order to ensure that the province has the benefit of the best scientific advice on the issues related to microbiological food safety, **I recommend that the provincial government in cooperation with the federal government and other provincial governments, establish an advisory committee which should be mandated to provide expert advice on questions relating to the microbiological safety of food.**

3.19 Science Capacity in Ontario

The importance of good science in the development of a food safety program cannot be underestimated. The Expert Advisory Panel in its report noted:

Food safety systems must be firmly based on sound science for the efficient and effective management of food safety problems, protection of public health and maintenance of consumer and business confidence. These systems should adhere to good risk analysis principles, and should have adequate scientific expertise and laboratory capacity to support policy development and programs. The current inspection regimes are solidly based in risk analysis and have been aggressively and appropriately using research, baseline studies and risk assessments to support the meat inspection, HACCP, and other programs that are intended to improve food safety. It is critical to maintain a high-quality food safety science capacity in Ontario that is based on solid research, surveillance and risk analysis.²⁰⁸

It is important for Ontario to maintain a high quality food safety science capacity.²⁰⁹ I agree with the recommendation of the Expert Advisory Panel. The proclamation of the *FSQA*, enactment of meat inspection regulations equivalent to the NMPRC standards and mandatory HACCP will all require a strong science and laboratory capacity to provide the necessary scientific foundation for the safety of meat in this province. For that reason, **I recommend that the provincial government provide necessary direction and resources to ensure that it has a high quality food safety science and laboratory capacity to provide research, surveillance and risk analysis.**

²⁰⁸ *Expert Advisory Panel Report, supra note 1, p. 202.*

²⁰⁹ *Ibid.*, p. 205.