

# FOOD Safety: A Scientific Perspective

Brought to you by the team of Registered Dietitians at Kellogg Canada Inc.

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Dr. Powell is an Assistant Professor in the Department of Plant Agriculture at the University of Guelph and Scientific Director for the Food Safety Network, where he leads a diverse research team that integrates scientific knowledge with public perceptions to garner the benefits of a particular agricultural technology or product while managing and mitigating identified risks.

## INTRODUCTION

Food- and water-borne illnesses are often more than just a couple of days of gastrointestinal distress. They can cause a lifetime of discomfort, seriously injure, and sometimes be fatal.

While accurate numbers concerning the extent of foodborne illness in Canada are not available, Health Canada estimates there are about 2 million cases each year, based on actual reports of 10,000 to 30,000 cases of foodborne illness with some 30 deaths (1,2). Canadian health authorities believe that for every case reported, there are at least 100 unreported (3). The medical cost and productivity losses for foodborne illness or food poisoning are further estimated at over \$1 billion per annum (4). Recent U.S. data based on active surveillance rather than passive reporting pegs the annual incidence of foodborne diseases at 76 million illnesses -- approximately 1-in-4 -- including 325,000 hospitalizations, and 5,000 deaths. Underreporting is also considered to be a major complication in providing accurate estimates (5). From 1993 to 1997, 68 per cent of outbreaks were of unknown origin (6).

With DNA fingerprinting, increased awareness and active media interest, the reporting of foodborne outbreaks and issues will continue to increase and media accounts will proliferate. The tragic outbreak in Walkerton, Ont., placed *E. coli* O157:H7 firmly in the minds of Canadians in 2000. Yet as recent outbreaks in New Brunswick (involving the death of a young child), Ontario and Regina have painfully illustrated, have our political and community leaders begun to comprehend that food and water safety is a primary concern for their constituents, worthy of a national action plan, or is it just one of those things that will, by some unknown force, be resolved? There are pockets of hopeful activity, both provincial and federal, with farmers leading the way.

And dietitians have an important role.

## FOOD SAFETY IN CANADA

Most Canadians and Americans think the most dangerous foods in the kitchen are chicken, other meats, and seafood. Yet increasingly fresh fruits and vegetables are a significant source of foodborne illness. That is why an on-farm food safety program was developed, implemented and analyzed for the Ontario Greenhouse Vegetable Growers in Ontario, Canada over a two-and-a-half-year period (7). This Hazard Analysis and Critical Control Point (HACCP) based system was designed to reduce the potential of microbial contamination along the entire production and distribution process. Through the use of microbiological testing, on-site visits and surveys it was determined that the program has increased grower's knowledge, understanding and awareness of microbial risks associated with fresh produce and caused improvement in practices used within the greenhouse and packing sheds. Both the Ontario Processing Vegetable Growers' Association (OPVGA), and the Ontario Fruit and Vegetable Growers' Association (OFVGA) have followed suit.

These industry-led programs are a fundamental component of a farm-to-fork food safety system.

At the fork end, dietitians have a leadership role to play in recognizing and fully understanding the complexity and subtle implications of simple food safety messages.

## DIFFERENCES OF SCIENTIFIC OPINION

It's never that simple. And consumers know it-

For example, The Canadian Food Inspection Agency (CFIA), like many other government and industry bodies, is adamant that frozen poultry or other meat should never be thawed on the kitchen counter. The preferred method is in the fridge. But barring an extra appliance, do many Canadians have room in

the refrigerator to house a frozen turkey for up to a week while it thaws? Some scientists, and even the Australian New Zealand Food Authority, recommend thawing on the countertop, followed by thorough cooking. The issue is that a frozen bird may never completely thaw in the fridge, and may therefore never reach a sufficient internal temperature to kill dangerous bacteria when cooking. And even if one uses a refrigerator, CFIA suggests that it takes about 10 hours per kilogram to thaw turkey. Other sources say it may take 26 to 33 hours per kilogram to thaw meat or poultry. In fact, there are significant differences of scientific opinion at almost every step of meal preparation that need to be acknowledged. Simple messages are never that simple, and may unintentionally amplify consumer concerns. Dietitians and others need to be honest about the limitations of science

## AGRICULTURAL CHEMICALS AND THE ROLE OF GENETIC ENGINEERING

As early as 1,000 B.C., the Chinese used sulphur as a fumigant. In the 16th century, arsenic-containing compounds were utilized as insecticides, and by the 1930s, the production of modern synthetic chemicals commenced. With the onset of World War II there was a rapid increase in the production and use of chemical substances such as DDT, used for control of insects transmitting malaria. As a direct result of technical advancements in chemical production during this period, various insecticides, fungicides and fumigants found their place in agriculture and food production. The desire to increase crop yields to meet escalating demands for food was one of the driving forces supporting the use of chemical applications in agriculture in the past, and continues today. As such, the post-war era marked the start of the modern agrochemical industry (8). Today, rather than externally spraying chemicals to bolster crop production, natural chemicals are genetically engineered into plants. And like pesticides before, the public discussion of agricultural biotechnology is evolving in similar manner of risk versus benefit, rather than a richer discussion of maximizing benefit while minimizing risk.

Independent scientific advisory bodies have repeatedly stressed that the benefits of a diet rich in a variety of fruit and vegetables far outweigh any potential adverse effects associated with the proper use of agricultural chemicals, including a 1997 report by the Canadian Cancer Society and the National Cancer Institute of Canada (9), which concluded that current pesticide regulations provide the public with a wide margin of safety. The report also emphasized the fact that the use of pesticides in agricultural applications is important in providing affordable and high quality food products, especially fruits and vegetables.

A comparative study released by InterNutrition (10), the Swiss Association for Research and Nutrition, concluded that many of the perceived environmental risks resulting from the planting of genetically modified crops are not justified by the emerging body of scientific evidence. In fact, such crops undergo more stringent testing than conventional foods.

## ORGANIC OR NOT

In response to the proliferating headlines about food safety, consumers are rightly asking, "What can I do?" One response is that consumer demand for organic food is increasing steadily. Studies have shown the primary reason that North American and European consumers purchase organic foods is a perception of "healthier" (12,13,11,14) even though the U.K. Advertising Standards Agency recently upheld complaints against claims that organic food is tastier, healthier and better for the environment and animals, finding that no such claims could be substantiated.

Further, the InterNutrition study (10) concludes that organic foods are neither healthier nor safer than conventional or genetically modified products. The comparison of organic and conventionally produced foods in more than 150 studies revealed only very slight differences in nutritional content and health-relevant constituents (vitamins, trace elements, minerals, heavy metals, protein, starch and sugar content), usually due to soil or climatic differences rather than the type of production system.

In some cases, significantly higher natural toxin concentrations were measured in various organic foods than in conventionally farmed products. These findings, though not conclusive, underline the need for stringent controls and further studies to ensure the safety of all food products, whatever their production method.

## KEY COMPONENT OF A FOOD SAFETY SYSTEM

What are the elements of a great food safety system, one that can rigorously promote the production and consumption of safe, high quality food? Here are five key components:

### *Effective and rapid surveillance*

If government and consumers demand programs to enhance the safety of the food supply, there should be a system of surveillance -- of numbers of sick people, of incidents of contaminated food -- to show that a particular program is working or not.

### *Effective communication about the risk.*

It's not enough to say, "We have safe food," especially when outbreaks of foodborne illness are documented on an almost daily basis. Instead, all players in the farm-to-fork continuum (Danes say, stable-to-table; fish people say, boat-to-throat), including farmers, processors, distributors, retailers, consumers and others need to talk about the risks inherent in any food production system and ways to reduce that risk.

### *A credible, open and responsive regulatory system*

Those same players want to know what the rules are and they want those rules to be fair. Ontario Bill 87, the Food Safety and Quality Act, goes some way toward this, as did the creation of the Canadian Food Inspection Agency at the federal level.

### *Demonstrable efforts to reduce uncertainty and risk*

Programs have been -- or need to be -- created to reduce risk on the farm, right through to the kitchen.

The Ontario Greenhouse Vegetable Growers have worked for the past three years to create, implement and monitor a food safety program for greenhouse cucumbers and tomatoes. On-site visits have been conducted with each of the 220 members and the primary areas of focus are water quality, worker hygiene, cleanliness of equipment, proper storage and transportation of the product. The growers have taken a hands-on and intensive individual approach to food safety, teaching operators how to identify and address potential microbial issues while following HACCP principles.

#### Evidence that actions match words

Having a program is nice, but discerning customers will demand the data, the proof, that such a program is actually working. Regardless of who does the inspection, results need to be public - - so researchers and others can offer a critical perspective, compare the effectiveness of Canadian standards with those of other countries, identify and rectify problems and assure consumers that perhaps, some food is safe.

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- (12) Davies et al., 1995 \*
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\* Not all references were available at the time of printing—please contact Dr. Powell at: (519) 824-4120 ext.2506 or, [dpowell@uoguelph.ca](mailto:dpowell@uoguelph.ca), for references.

# FOOD Safety: An Industry Perspective



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Laurie Curry is Vice President, Public Policy & Scientific Affairs for The Food and Consumer Products Manufacturers of Canada (FCPMC), and is also a Registered Dietician. FCPMC is a national association of more than 165 companies engaged in the manufacturing and marketing of consumer packaged goods available through retail and foodservice outlets. Ms. Curry concentrates her efforts on advancing public policy in Canada and internationally to improve food safety, food security and healthy food choices.

*Canadian Food Manufacturers are committed to Producing a Safe, High Quality Food Supply*

## INTRODUCTION

Did you know that 74% of Canadians say they are concerned about the safety of the food they eat, with Canadians 55 and older expressing even more concern? And that 41% of these Canadians feel food safety is primarily an issue during the processing stage of the food supply chain? These are some of the findings from an Ipsos-Reid<sup>1</sup> poll conducted in the Fall of 2001 on Canadians and food safety. Faced with such negative consumer perceptions of Canada's food supply, it is our responsibility as health professionals to help consumers understand how securely our food supply in Canada is safeguarded and the rigorous standards in place to which food companies adhere.

## CANADA'S WORLD CLASS REGULATORY STANDARDS

Food manufacturers are committed to producing a safe and high quality food supply for Canadian consumers. In fact, Canada's food and drug regulations are some of the most stringent in the world, which means that all food manufacturers maintain the absolute highest standards of quality. Looking at archetype analysis conducted by Dr. C.G. Rapaille on how Canadian consumers view food and the role of eating in their lives, we can understand why they place such a high emphasis on quality and safety. According to the analysis, the Canadian archetype sees food and eating in a maintenance role and adheres to the adage "you are what you eat."

Food manufacturers are proud of Canada's world-class regulatory standards, which help deliver the safe and high quality products that consumers demand. Overall, manufacturing processes in Canada are governed by 353 federal and provincial pieces of legislation ranging from food safety and nutritional quality to human rights and labour relations. Examples of major food safety legislation include the *Food and Drugs Act*, the core federal legislation regulating the safety and nutritional quality of food sold in Canada, and Ontario's recent *Food Safety and Quality Act*, the consolidation of six food-related acts to ensure a common approach and consistent standards for the safety and quality of our food.

## MANUFACTURERS GO BEYOND

In addition to legislation, manufacturers go beyond government standards by drawing on thousands of regulations and self-imposed standards, such as ISO certification, to ensure their food products meet and exceed compliance with health and safety requirements. After finished goods have left processing facilities, food manufacturers also have policies and systems in place to help retailers properly handle and store their products to ensure consumers buy a safe and high quality product. Some of these policies and systems include quality checks of store shelves, retail reimbursement programs for outdated products and policies to reclaim and destroy out-of-date product.

As the association representing food manufacturers (FCPMC) does its part to ensure the safety of our food supply by working with the Canadian government to set and maintain the highest food safety standards. The Canadian government is responsible for ensuring the safety of all products approved, including those made using new technologies, before they reach the marketplace. Consistent with the government's goal, we are helping to improve Canada's ability to develop and provide safe and nutritious products through ongoing involvement in regulatory development.

In 1996 FCPMC worked with Agriculture and Agri-Food Canada, Industry Canada and other industry partners to develop the Guide to Food Labelling and Advertising. The guide is an important reference document for the food industry on policies and regulations for the labelling and advertising of foods in Canada including application of 'best before' dates.

### References

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## PARTNERS IN-FOOD-SAFETY

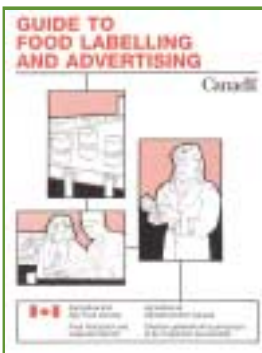
FCPMC builds strategic partnerships between the public and private sectors by working with a variety of groups, including government agencies, such as Health Canada and the Canadian Food Inspection Agency (CFIA), health organizations such as the Dietitians of Canada and Anaphylaxis Canada, and consumer groups, such as Canada's Association for the 50+ (CARP). Dietitians employed by the food industry and other related organizations are also involved in committee work at various levels of food safety and scientific regulatory standards.

### *Here is a sample of the food safety initiatives undertaken by FCPMC on behalf of its members:*

- Actively participate on the Canadian Supply Chain Food Safety Coalition. The Coalition provides leadership, working with all levels of government, to develop a national food safety strategy.
- In cooperation with the retail sector and CFIA, produced a *Supply Chain Food Product Recall Manual* for developing recall plans to ensure consumers are informed and protected about food recalls.
- Offers educational seminars for its members on different aspects of food safety.
- Develops manuals that serve as templates for the development of food industry best practices guidelines. In 1993, a manual was developed as part of an innovative education program on allergen management for the manufacturing industry, called *Allergy Beware*. This program was designed to minimize the potential for cross contact and possible consumer exposure to allergens during the food production process.
- To help navigate the sea of Canadian legislative requirements, FCPMC compiled an extensive on-line resource called the *Code of Practice*, which offers the latest information via direct links to all federal, provincial and territorial regulatory data on every aspect of food and consumer product manufacturers' corporate activity.
- Supporting member of the *Fight Bac!* Program, run by the Canadian Partnership for Consumer Food Safety Education. The partnership is committed to reducing foodborne illness in Canada.

*It is important to remember that everyone involved in the food chain, from the primary producer to the consumer, has a role to play in ensuring the safety of our food supply. Industry and health professionals, such as dietitians, also have a role to play in communicating to Canadians about the safety of our food supply, so that they feel confident about the foods they are eating.*

## RESOURCES



The Guide to Food Labelling and Advertising and the Supply Chain Food Product Recall Manual can be accessed through the Canadian Food Inspection Agency at: [www.inspection.gc.ca](http://www.inspection.gc.ca)

Allergy Beware Manual and Supply Chain Food Product Recall Manual can be ordered at: [www.fcpmc.com](http://www.fcpmc.com)

For more information about the legislative statutes governing the food industry, visit: <http://www.fcpmc.com/english/publications/code/index.htm>.

The Food Safety Network can be found at: [www.foodsafetynetwork.ca](http://www.foodsafetynetwork.ca)

For more information about the Fight Bac!, food safety program, visit: <http://www.canfightbac.org>

