



Ontario Food Processing Research and Services Committee

Strategic Priorities Report 2004-2008

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Minutes of the 2003 Annual Meeting of the Ontario Food Processing Research & Services Committee

Special thanks to members of the food industry who participated in the food industry focus group meeting and the food industry association interviews; and to researchers who completed the survey of food researchers. Also, thanks to OMAF's Food Industry Competitiveness Branch staff, Doug Chapman, Eugene Jaworski and Peter Illyckji, who facilitated the involvement of food industry members; and Nega Yahya, OMAF Food Inspection Branch; and Vicky Grahovac and Carolyn Moore, OMAF Innovation and Risk Management Branch who prepared background information.

Introduction

OASCC

The Ontario Agricultural Services Coordinating Committee meets annually to review regularly the broad aspects of agri-food research, extension, and education in Ontario with the objective of :

- facilitating communication and coordination among different groups at the management level;
- assessing immediate and future needs, and developing proposals for ways to take care of them;
- advising on joint uses of facilities and people;
- contributing information and ideas about regional and national policies affecting agriculture and food.

The Ontario Food Processing Research and Services Committee (OFPRSC) is one of nine committees that report to the Ontario Agricultural Services Coordinating Committee (OASCC). The OFPRSC is comprised of representatives of the food industry in Ontario, research institutions, Agriculture and Agri-Food Canada and the Ontario Ministry of Agriculture and Food. It is mandated to identify and prioritize food processing research needs and services to facilitate the effective conduct of publicly funded food research and development in Ontario.

Every four years, the OFPRSC completes a strategic priority setting process. In 2003, a new process was used by the OFPRSC to develop strategic priority recommendations for the period 2004-2008. In June, 2003 a focus group meeting was held with food industry representatives to discuss short term and long term issues facing the food industry in Ontario. During the summer of 2003, interviews were conducted with Ontario food industry association executive staff and a written survey was also sent to researchers to gain their input. To provide background information to the OFPRSC, a report was prepared that described Ontario's food processing industry, current food issues and trends, the food research capacity in Ontario, and research priorities in other jurisdictions.

Using the information gathered in the processes described above, the OFPRSC met on September 19, 2003 and identified four strategic research priority areas and two service priorities. This report describes these recommendations. The recommendations were forwarded to OMAF in November, 2003 and presented to the OASCC committee in February, 2004. The recommendations were also forwarded to all of the Expert Committees that report to the Canada Committee on Food (CCF). The CCF, after reviewing the report, forwarded Overall Recommendation #2 (Improve Research Communications Throughout the Food Continuum) to the Canadian Agricultural Research Council (CARC). This recommendation was accepted and distributed as a part of the overall CARC recommendation for 2004.

The Ontario Agriculture and Food System 2003

Producers
59,728 Farms
\$9.1B/130,000 Jobs Equivalents*

Food, Beverage & Tobacco Manufacturers
3,771 Firms
\$30.3B/109,200 Jobs

Foodservice
36,436 Firms
\$16.9B/305,100 Jobs

Food Stores
13,731 Firms
\$21.0B/176,000 Jobs

* Job Equivalents - The number of farm job equivalents has been determined by adding the number of census farm operators to an estimate of hired farm paid labour which was based on the number of weeks of year-round plus seasonal paid labour reported on the census.

Highlights from 2003 Annual Meeting

The OFPRSC annual meeting, held on September 19, 2003, was chaired by Doug Chapman, and attended by ten members of the OFPRSC and seven guests. The purpose of the meeting was to establish strategic priorities for food research in Ontario. To set the strategic tone for the meeting, Dr. Ricky Yada, Scientific Director, Canadian Advanced Foods and Biomaterials Network, was invited to speak about this new and exciting initiative. This was followed by a presentation by Carolyn Moore, Research Analyst, OMAF describing trends related to the food industry and research. Doug Chapman, Chair, OFPRSC reported the results of the food industry focus group, interviews with food industry association executives and the survey/focus group with researchers. The information from these presentations are highlighted on pages 3-5. Following the presentations, the chair facilitated a discussion to determine the strategic priority areas for research and services. The committee's recommendations are presented on the following pages.

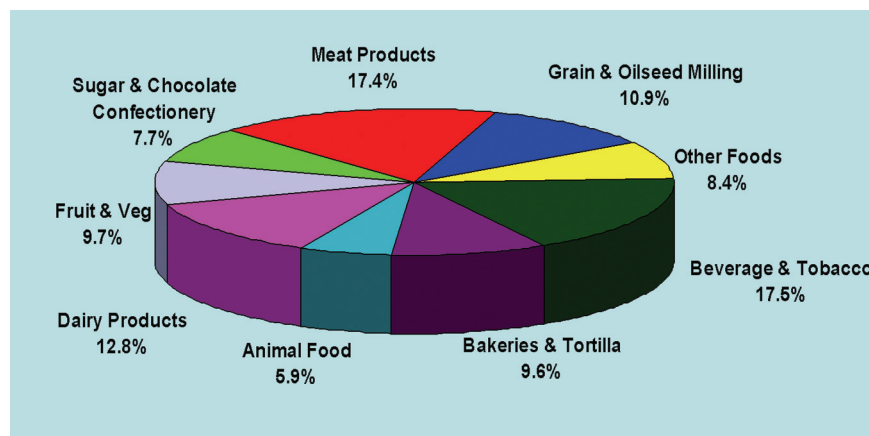
Canadian Advanced Foods and Materials Network

The Canadian Advanced Foods and Materials Network, announced in November, 2003, is a Canada-wide interdisciplinary network of world class researchers who will work on different aspects of advanced foods and materials. This nationally funded Network will undertake activity in three theme areas:

1. Structure-Dynamics-Function of Food and Materials (including bio-surfaces; and bio-structures and bio-products);
2. Functional Foods and Nutraceuticals (including extraction and identification; and mechanism and efficacy); and
3. Genetics, Ethics, Economics, Environment, Law and Society (including consumer and citizen perception and acceptance; regulation and policy; and risk assessment and management).

The Network will support enabling research and technologies and train the next generation of scientists/researchers and policy makers.

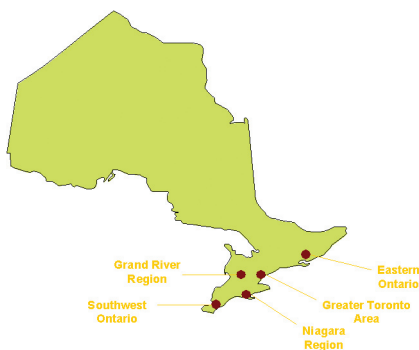
Ontario's Food Industry is Well-Diversified Ontario 2003 Total Value of Shipments: \$30.3 Billion



Source: Statistics Canada

The Ontario Food Processing Research and Services Committee

Chair: **Douglas Chapman**, Director, Food Industry Competitiveness Branch, OMAF; **Pat Collins**, General Manager, Laboratory Services, University of Guelph; **Ken Darley**, Vice President - Technical, Griffith Laboratories; **Levente Diosady**, Professor, Department of Chemical Engineering, University of Toronto; **Jim Gordon**, Director, Research and Development, Schnieder Foods; **Jane Graham**, Executive Director, Alliance of Ontario Food Processors Association; **Michael Hincks**, VP Life Sciences, Bodycote Materials Testing; **Terry Maurice**, President & CEO, Guelph Food Technology Centre; **Puni Piyasena**, Acting Director, Agriculture and Agri-Food Canada Food Research Centre; **Peter Purslow**, Chair, Department of Food Science, University of Guelph; **Venket Rao**, Professor, Dept. of Nutritional Sciences, University of Toronto; **Susan Read**, Science Program Coordinator, Health Canada; **Gordon Timbers**, Research Co-ordinator, Agriculture and Agri-Food Canada; **Margaret Treloar**, President, Treloar Product Development Inc.; **Ron Osborne**, Vice-President, Quality Assurance and Food Safety, Caravelle Foods; **Carolyn Moore**, Research Analyst, OMAF.



Trends Related to the Ontario Food Industry and Research

1. The Ontario food industry is primarily located in five clusters in Ontario, is well diversified and contributes \$31.5 billion to the provincial economy. Toronto is the second largest food cluster in North America and the fastest growing.
2. Ontario exports have tripled over the past decade, with 87% of Ontario exports going to the U.S. market. Globalization is resulting in the need for food to be transported greater distances, the use of international food standards, and the emergence of a global e-commerce system for food purchasing.
3. Seeking opportunities for value-added continues to interest Ontario food producers and manufacturers. It is estimated that the functional foods and nutraceuticals market in Canada is worth over \$1 billion/year. Specialized ingredients, convenience, and the ethnic market present additional opportunities for the Ontario industry.
4. Demographics will continue to drive the health and wellness trend, with older Canadians and increasing numbers of young consumers ranking nutrition as an important factor when choosing food. In general, consumers are more closely scrutinizing the food they eat, and although they want it to be fast and fresh, they also are concerned about its safety.
5. The increasing incidence of obesity and related diseases, diabetes and cardiovascular disease, has the public, government, health professionals and the food industry considering the steps necessary to help consumers make healthy food choices. Trans fat, the role of macronutrients in satiety and weight control, sugar sweetened drinks and sodium are topics being discussed.
6. Food recalls cost the food industry millions of dollars each year. Microbial food safety continues to be important, and further research is needed on foodborne viruses and antibiotic resistant strains of Salmonella. Chemical contamination, including allergens, residues of pesticides, veterinary drugs, and chemicals formed during processing are also important. Traceability programs are being developed to deal with tracking and tracing, product recalls, crises management and identity preservation.
7. The Ontario food industry is facing significant federal and provincial regulatory change including: nutrition labeling, natural health products, labeling of genetically modified organisms (voluntary), food fortification, revisions to the Food and Drug Act, environmental protection, waste diversion, and nutrient management.
8. The food research capacity (public) in Ontario has grown in recent years as a result of investments from the Ontario Research and Development Challenge Fund, the Ontario Institute for Innovation and the Canadian Foundation for Innovation. Programs at the University of Guelph, Agriculture and Agri-Food Canada, the University of Toronto, Brock University, University of Western Ontario, and Health Canada provide expertise in the province related to food safety and quality, materials science, functional foods, and nutrition.
9. The role of publicly funded research is increasingly being linked to innovation, technology transfer, the development of public policy and building a critical mass of expertise.

Summary of Input From Food Companies, Food Associations and Researchers on Current and Future Issues and Direction for Research (not listed in priority order)

Food Companies	Food Associations	Researchers
Canadian Nutrient Database/Nutrition Surveillance	Production Enhancement of High Quality, Raw Ingredients	Obesity and Health
Obesity	Looking at the Agri-Food Industry as One, Rather Than Parts	Consumer Directed Communications Programs and Information Needs of Consumers
Allergens	Food Quality and Safety	Regulatory Issues
Regulatory	New and Improved Food Products/Ingredients	Understanding Pathogens & Their Environment
Competitiveness, Help for Small Businesses	Diet and Health, Consumer Science	Food Quality and Health
Waste Management	Processing/Packaging/ Energy/Waste/ Environment	Environmental Issues
Tracing Systems Tools to	Track and Identify Legal and Regulatory Obligations	Health Impacts of New Foods and Technologies
Health Concerns of a Maturing Population/Impacts of Demographics		Safety and Quality of Organic Foods
Business and Industry Leadership		Foodborne Viruses and Natural Toxicants
Uses of Phytochemicals		Strategies to Control Foodborne Pathogens and Intervention Methods
New Food Processing Technologies		Development and Validation Methods for Foodborne Pathogens
New/Novel Food Products and Acceptability		Effectiveness of Food Safety Policy/Consumer Confidence in Food Safety

Food Companies, Associations and Research Institutions Who Provided Input

- Aki Fine Foods
- Backerhaus Veit
- Better Beef
- Brittany Acres Ltd
- Burnbrae Farms
- Campbell Soup Co. Ltd.
- Casco
- DiPardo Packing
- Effem Foods
- Flavours of North America
- Food Development Group
- Griffith Laboratories
- Heinz Foods
- Kraft (Dresden)
- Keybrand Foods
- Malbar Super SpicePride Pak
- Sensient Technologies
- Alliance of Ontario Food Processing Associations
- Brewers of Ontario
- Ontario Dairy Council
- Ontario Flour Millers Association
- Ontario Food Processors Association
- Ontario Vegetable Growers Association
- Food and Consumer Products Manufacturers of Canada
- Soy 20/20
- Wine Council of Ontario
- Niagara College/Brock University
- Queen's University
- Central West Planning Information Network - McMaster University
- University of Guelph
- University of Toronto
- Agriculture and Agri-Food Canada
- Health Canada

OFPRSC Research Recommendations

The Agricultural Policy Framework

“Co-ordinate along the whole value-chain” is one of three main goals for the Science and Innovation Chapter of the Agricultural Policy Framework. The Soy 20/20 initiative, funded as a pilot project under the Agricultural Policy Framework, is a partnership between industry, government and academia to stimulate and seize new global opportunities for Canadian soybeans. This project is using expert global intelligence, research and analysis and is focusing on higher margin, specialty trait soy products and commodity based industrial products.



Overall Recommendations for Food Research in Ontario

In addition to determining priorities for areas of research, the Ontario Food Processing Research and Services Committee made the following recommendations about how food processing research should be coordinated and communicated. These recommendations apply to all the priority areas of research identified in the pages that follow.

1. **Link Food Processing Research to Value or Supply Chains.** Provincially funded food processing research has an important role in providing new, industry relevant knowledge and technologies in support of the Ontario food sector, often at the applied level. Historically in Ontario, agri-food research has been compartmentalized, from production through to the consumer. However, increasingly, issues such as food safety, food traceability and product innovation are being dealt with by industry through networks and coalitions of some or all the players in a value-chain. During its deliberations, the Ontario Food Processing Research and Services Committee felt strongly that food processing research needs to follow the lead of industry, and be better linked to the many stakeholders and other researchers involved along the food continuum.
2. **Improve Research Communications throughout the Food Continuum.** The committee also identified that funders and coordinators of research need to improve their communications related to research priorities, funding opportunities and research results. The food continuum is complex with many players. Increased communications will support researchers to pursue research in those areas that are strategic and focussed on making a difference and better linked to the needs of the customer. Improved communications will also facilitate better transfer of new knowledge and technologies; provide more accountability for the research undertaken; and leverage current funding with resources from other sources.
3. **Consider the Needs of the Consumer.** The ultimate customer of a value-chain is the consumer. The Ontario Food Processing Research and Services committee recommends that there is a need to focus on the end consumer as the most important element in the food chain. Consumers are not a homogenous group and as Ontario's position in a global marketplace expands, it is necessary to consider the needs of consumers not only in Ontario (both conventional and niche markets) but also around the world.

Research Priority Area # 1: Create New Knowledge, Technologies and Products that Contribute to the Nutrition and Health of Canadians

At the start of the 21st century, consumers are spending less time preparing food but more time scrutinizing what is in it, how it was produced and its overall role in health. Increasingly they are looking to natural health products, organic foods, and functional foods and nutraceuticals to improve and/or maintain their overall health. Health Canada has passed new regulations permitting expanded nutrition labelling and nutrition and health claims that will provide additional information to help consumers make informed food choices. New regulations for food fortification and for natural health products are being proposed.

Increasingly, food is being positioned as a wellness product by industry. This trend may have originated in response to the baby boomers who are seeking to delay the ageing process. However, the growing problems with diet-related chronic diseases such as obesity, type II diabetes, cardiovascular disease and cancer in younger age groups may alter how society views food in general. Improved efforts to educate consumers about food choices and portion sizes will have to be made. However, opportunity exists to improve the overall diet through providing food choices that combine consumers' need for fast, fresh, convenient, tasty, and good value with improved nutrition.

There is clearly a need for research to advance the understanding of the connection between food, nutrition and health; and to transfer this knowledge to the public, health professionals, and to industry to facilitate the development of new and improved food products. Ontario is home to some of the leading medical, food science, engineering and agriculture faculties in Canada. This provides the capacity to conduct interdisciplinary research that will address strategic health concerns while at the same time supporting the expanded use of Ontario food products in the diets of Canadians and other consumers around the world.

Research needed in this priority area:

- Provide data on the composition of Ontario foods that can be used by consumers, industry and government for the purposes of nutritional surveillance, policy and regulatory development, nutrition labelling, research, and nutrition education. Data needed includes information on the bioavailability of nutrients, the phytochemical and antioxidant content of food, the presence and level of trans fatty acids, and nutrient profiles on single ingredient commodity foods, novel foods and those foods produced using alternate production methods such as organic farming.
- Determine the health benefits of plant and animal based foods produced in Ontario, in relation to chronic diseases and illnesses that have significant impacts in Canada and/or elsewhere.
- Use new or existing technologies, from plant and animal breeding through to food processing, that can improve the nutrition profile of Ontario foods e.g. reduction of trans fats, improved profile of fatty acids in oilseeds.
- Formulate new wellness products that address the health needs of specific target audiences e.g. osteoporosis in women.
- Assess and/or develop methods of processing, storing, packaging, and distributing food that preserves nutrients and other bioactive components.
- Provide data to support health claim substantiation studies.
- Use new methods to overcome problem sensory attributes of healthful foods.
- Develop a better understanding of the role of nutrients in satiety and use this knowledge to enhance the satiety value of foods.
- Increase the understanding of the acceptance of new technologies and foods by consumers. E.g. Use of biotechnology to genetically modify crops to nutritionally enhance products; will these be accepted by consumers?
- Increase the understanding of consumer perceptions and attitudes related to functional foods vs. nutraceuticals (pills). Why may functional ingredients be acceptable in some foods and not others e.g. probiotics in dairy products vs. cereal products?
- Determine effective and alternative delivery systems for communicating with consumers e.g. interactive kiosks, broadscale communication programs, websites, labelling, direct to consumer communications.
- Develop methodologies for new consumer testing that can be targeted at specific groups e.g. seniors, children, restaurant patrons, convenience users.

"Canadians are now more likely to be obese than adults in most other OECD countries. Countries such as the Netherlands, Norway, Sweden and Switzerland have adult obesity results more than one-third lower than Canada. On the other hand, the U.S. and U.K. have higher obesity rateswhile obesity can be influenced by genetic factors, physical inactivity and poor diet are clearly factors".

- Building on Values, The Future of Health Care in Canada, The Commission on Health Care in Canada, 2002

Fast Facts:

For the period 2001-2002, the Canadian Food Inspection Agency reported a total of 474 food recalls in Canada. The following list provides a breakdown into the major reasons for the recalls:

Allergens	258 (54%)
Microbiological	107 (23%)
Chemical	66 (14%)
Extraneous	37 (8%)

In July 2003, the Canadian Council of Grocery Distributors, the Food and Consumer Products Manufacturers of Canada, the Canadian Federation of Independent Grocers and the Electronic Commerce of Canada signed an agreement to form an alliance aimed at defining Canadian requirements, consistent with global standards, for tracking and tracing, and developing industry-led recommendations for a national tracking and tracing solution set relative to food safety in Canada.

Research Priority Area # 2: Conduct Research to Optimise the Ontario Food Safety System, including Traceability and Assurance Programs

Research has been a cornerstone of Ontario's ability to produce, manufacture and distribute safe food. Research supports industry's implementation of food safety programs such as HACCP, provides science-based evidence to develop policy and regulation, and provides the capacity to monitor and test food. With the cluster of federal health and agriculture laboratories, the University of Guelph programs and the Canadian Research Institute for Food Safety in Guelph, and microbiology programs at other Ontario universities, Ontario has the capacity to be a leader in food safety research. In the decade ahead, it will be important to build upon existing food safety research knowledge, technology and capacity to address emerging needs that are important for public health and to support industry as it looks to grow its domestic and international markets. The Ontario food safety system must maintain the flexibility needed to keep pace with rapid changes in the nature of food, increased globalization, and shifting public expectations.

In addition, the food industry will increasingly need to develop and comply with traceability systems demanding more information about the vertical food supply chain and specifically, the origin and handling of basic commodities and food products produced and consumed locally and throughout the world. A key purpose of traceability systems is to minimize product recalls and provide/support quality and safety assurance programs. Food research should be focusing on the development of tools and procedures for traceability.

To support food safety and traceability, Ontario research needs to focus on the following areas. As the food safety system evolves, other related areas of research may also be needed.

- Research on the development of test and sampling methodologies to improve accuracy, speed, specificity and affordability of existing and novel methodologies. The emphasis should be on linking detection methods with virulence genes or proteins to differentiate highly virulent from avirulent or weakly virulent food-borne pathogens.
- Research on synergistic effects of current and emerging hurdle technologies (thermal and non-thermal), for the quantitative reduction/control of pathogens; advantages and limitations of non-thermal processing.
- Research to establish food allergen thresholds; risk assessment/identification of compounds formed during processing and storage; methods/strategies to remove naturally occurring toxic contaminants; determinations of the safety of genetically engineered foods in terms of food allergens and other potentially toxic chemicals.
- Research to detect dietary supplements, allergens, veterinary drugs, genetically modified organisms and decontamination procedures designed to remove and/or chemically modify toxic contaminants.
- Research to increase the understanding of consumer perceptions and attitudes related to food safety; to determine effective delivery systems for communicating with consumers.

Research Priority Area # 3: Develop Alternative Uses for Ontario Food Processing Waste and Co-Products, Including Value Added Components

The management of liquid and solid waste as well as co-products generated by Ontario's over 3700 food and beverage manufacturers and 47,000 foodservice and retail establishments presents a growing problem as well as an opportunity. In the face of increasing pressure from regulatory bodies and the cost associated with handling waste, there is a need to minimize waste production and encourage environmentally friendly, cost effective options for waste utilization. Low margin food processing could be greatly improved if co-products of processing provided a return instead of a cost burden.

Improved utilization of the co-products of food manufacturing presents an enormous opportunity for the food industry. Of the total tonnage of grain milled in Ontario, 28-30% results in bran that is primarily used as livestock feed. Spent grain from ethanol, alcohol and beer fermentation is another coproduct. Cheese manufacturing produces 90% whey. No more than 60 - 70% of the raw products are utilized during vegetable processing with less than 50% in the fresh - cut vegetable processing sector. Less than 45% of the live animal is used for meat.

Food processing co-products contain valuable components and the growing worldwide functional foods and nutraceutical market is an attractive opportunity to create new uses for what would otherwise go into the waste stream. Other potential applications are food ingredients, medical, pharmaceutical and cosmetic use.

New federal government regulations have banned the use of specified risk materials in the human food chain. The federal government is expected to also ban ruminant meat and bonemeal from all animal feed which will require changes to the rendering system. Products that used to have value are now becoming a waste product. New technologies will be required for safe disposal or utilization.

Research required in this area includes:

- Identification of functional components of waste and co-products.
- Environmentally friendly and safe extraction technologies to remove valuable components from waste and co-products from Ontario processing plants.
- New packaging technologies that can extend the shelf life of food and/or be recycled to minimize waste.
- Development of biobased and biodegradable packaging.
- Technologies to purify plant processing water for recycling through the plant.
- Generation of energy from solid waste to be used on site to reduce energy costs.



OFPRSC Service Recommendations



Service Priority # 1: Develop Programs/Initiatives to Address the Need for Skilled Labour in the Food Industry

An important outcome of research funding is the training provided at the undergraduate and graduate levels. Participants in these programs, who most often fill technical, engineering and management positions in the food industry, are important links in the transfer of new technology to industry. The University of Guelph has the only food science program in Ontario that is accredited by the Institute of Food Technologists. The current enrollment in this program is insufficient in number to meet the needs of the Ontario food industry. It is recommended that efforts be made to attract and retain students into these programs.

Service Priority # 2: Provide Policy and Market Trend Analysis to Support the Competitiveness and Innovation of Ontario's Food Industry

Understanding the enablers and barriers to innovation and competitiveness is needed if Ontario's food industry is going to successfully compete internationally. During consultations with food industry, several issues were raised that participants felt needed further analysis to help direct government policies, research and industry.

These issues include:

- Impact of regulation on competitiveness and innovation, including:
- Regulatory burden on food industry by federal, provincial and municipal jurisdictions.
- Lack of harmonization of regulation between Canadian provinces and between Canada and the U.S.
- Current regulations on the transfer of new technologies or novel applications and the ability of Ontario companies to innovate.
- Analysis of emerging markets and the behaviors and preferences of consumers in those markets.
- The sectors or product areas in which Ontario firms are world leaders and the areas where they are not. What is Ontario's standing relative to other jurisdictions in the areas where they are not world leaders?
- Competitiveness of Ontario plants related to labour costs, raw materials, freight costs, productivity costs, energy and supply management.
- Quantification of waste generation and current efforts to divert usable and non-usable food residuals from the waste stream.
- Models to engage consumers in the development of food policy.