A Global Hub for Food Processing

AGRI-FOOD ASSET MAP

AN ANALYSIS OF ONTARIO'S R&D EXCELLENCE AND COMMERCIALIZATION CAPACITY IN FOOD PROCESSING
<table>
<thead>
<tr>
<th>TABLE OF CONTENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Summary 2</td>
</tr>
<tr>
<td>The Ontario Advantage 4</td>
</tr>
<tr>
<td>A Flourishing Food Processing Industry 14</td>
</tr>
<tr>
<td>Strength in Research and Innovation 22</td>
</tr>
<tr>
<td>Capitalizing on the Ontario Advantage 36</td>
</tr>
<tr>
<td>Appendices 42</td>
</tr>
</tbody>
</table>
“From the farm to your table, the revolution in Ontario’s food economy shows the power of creativity to transform every single sector of the economy. It’s a tremendous economic, cultural and environmental success story that regions and countries around the world should look to as an inspiration.”

– Richard Florida, Director of the Martin Prosperity Institute at the University of Toronto, Professor of Business & Creativity at the university’s Rotman School of Management, and Author, *The Great Reset.*
EXECUTIVE SUMMARY

WITH ITS COMPETITIVE COSTS, innovative research climate and easy access to ingredients and global markets, Ontario’s agri-food industry has emerged as a leading North American hub for world-class business in food processing.

This Agri-Food Asset Map highlights Ontario’s agri-food strengths and provides an overview of the cutting-edge research, industry research collaborations, food and agriculture resources, unique commercialization facilities and government supports in place to drive the growth of food processing and to ensure Ontario’s continued competitive advantage in this key sector.

A variety of factors converge to give Ontario its competitive advantage in the agri-food sector. The province boasts rich agricultural lands that produce more than 200 agricultural commodities – a diversity unmatched in most parts of the world. Ontario’s extensive transportation networks help speed just-in-time deliveries and connect the province with markets in North America and around the globe. Innovation costs and business taxes are low, and the province is home to an exceptional workforce that is well educated, skilled and ethnically diverse.

With manufacturing revenue totaling $34 billion, Ontario’s food and beverage processing sector is one of North America’s largest and most significant. Approximately 3,200 food and beverage businesses are registered in Ontario, including multinationals, homegrown giants and successful niche-driven businesses that have recognized the tremendous advantages of doing business here.
Ontario food and beverage suppliers have an excellent reputation for flexibility and customer-focused service, and have proven experience with custom production runs. The ability to serve specialty markets, combined with the province’s agricultural and multicultural diversity, has positioned Ontario for success in key growth food processing markets, such as private label and healthy and ethnic foods.

International buyers continually choose to source products from Ontario suppliers, who are known for being ahead of the curve with food trends. Ontario agriculture and research are also innovative in supporting alternative crops, such as ginseng, and new products, such as omega-3 eggs, for emerging and growing markets.

Ontario’s world-leading and extensive network of universities and colleges provides state-of-the-art food and nutrition research programs. Scientists here are undertaking groundbreaking research into food science and nutritional sciences and exploring topics that include food nanostructure, functional foods and food safety, to name just a few.

Ontario also possesses unique commercialization facilities and industry networks that assist researchers and food and beverage manufacturers in bringing innovative agri-food products to market.
In today’s global business environment, large and small companies locate their businesses wherever they find the best combination of talent, cost-efficiency and market access. With its innovative research climate, competitive costs and easy access to global markets, Ontario has emerged as an efficient North American hub for global business. Multinationals have recognized the tremendous advantages of doing business here. In its forecast of the international business environment through to 2011, The Economist Intelligence Unit ranked Canada as the number one place in the G7 to do business, thanks to Ontario’s openness to foreign trade and capital, high-quality infrastructure and opportunities to reach the North American marketplace.

Ontario is Canada’s economic engine, the nation’s financial and manufacturing centre, generating almost 40% of the country’s GDP (gross domestic product). With one of North America’s top 10 economies, Ontario’s GDP of more than $587 billion is larger than that of Switzerland, Belgium, Greece, Sweden or Austria, to name a few.

Ontario’s economy is tightly connected to global markets: an integral part of the North American Free Trade Agreement (NAFTA), Ontario offers direct access to the US$17-trillion-plus North American market and its population of 456.5 million. NAFTA rules allow goods to enter the United States and Mexico duty-free when at least 62.5% of their content is manufactured here.

In 2009, Ontario’s international exports were close to $147.7 billion, accounting for 41% of Canada’s exports. Ontario has forged strong trade partnerships with Europe and Asia: total trade with leading European countries has grown to $30 billion annually and to almost $40 billion with Asia’s leading countries.

Ontario stretches more than one million square kilometres (415,000 square miles) — an area larger than France and Spain combined. The northern edge of the province lies at roughly the same latitude as Copenhagen and the Alaskan panhandle. The southern, more temperate border along the Great Lakes (one of the largest freshwater basins in the world) is on the same latitude as Rome and Northern California. Ontario also has almost 20% of Canada’s freshwater resources.

The rich agricultural lands and mild climate of southern Ontario allow for the production of more than 200 agricultural commodities — a diversity unmatched in most parts of the world. Many of these commodities are processed within the province; Ontario has a well-developed supply chain network of primary processors, ingredients manufacturers, specialty importers and value-added processors.
Sophisticated Distribution Networks

Ontario’s proximity to major U.S. markets, combined with the province’s highly efficient transportation infrastructure, makes delivering products from factory to market quick and convenient. Considering that business costs in Ontario are lower than in the United States, it is not surprising that so many multinational corporations have established large operations here.

Strategically located right in the middle of the North American marketplace, Ontario is a natural distribution centre for important markets. Ontario’s transportation infrastructures are extensive and well integrated with U.S. and global systems. Highway and rail networks with advanced traffic-management systems help speed just-in-time deliveries and connect Ontario with markets in Eastern Canada, Western Canada, the United States and Latin America. Marine lines offer shipping options to ports throughout the Great Lakes and around the world. With five international airports and 80 regional airports, Ontario business centres, such as Toronto, Hamilton, Ottawa, Thunder Bay and London, are only a short flight from other major North American cities, including Detroit, Chicago, New York and Boston. Ontario’s largest airport, Toronto’s Pearson International, is serviced by more than 75 airlines that provide direct routes to 50 cities in the United States and 105 cities abroad.

Fifteen road, rail and marine border-crossings provide access to the U.S. market. Ontario’s largest city, Toronto, is located within one day’s drive of 158 million consumers (see Figure 1, page 8). The U.S. states within this radius are home to approximately 49% of the U.S. population. The border crossing between Windsor, in southern Ontario, and Detroit, in the northern United States, is the busiest trade corridor in North America. Every year, more than 16 million trucks and cars and $140 billion in goods pass through this gateway.

Pictured below is the Ambassador Bridge which connects Detroit, Michigan, in the United States, with Windsor, Ontario, in Canada.
**Figure 1:** Significant Markets Located in Close Proximity to Ontario
A Hub of Innovation and Research Excellence

Ontario is home to outstanding research and educational institutions, such as the universities of Guelph, Toronto, Western Ontario and Queen’s. World-class researchers are exploring virtually every area of advanced manufacturing, information technology, agriculture and life science. Ontario is a world leader in food technology research and development.

More than $12.5 billion in R&D takes place every year in Ontario. Throughout the province are incubators, research parks and technology transfer offices. Such organizations as the Ministry of Research and Innovation and Ontario’s Centres of Excellence work closely with industry partners to bring innovations to market. The Ministry of Agriculture, Food and Rural Affairs (OMAFRA) is investing significant amounts through the OMAFRA/University of Guelph Agreement and its competitive funding programs into research that meets food industry priorities, and it is a source of funding for collaboration between the food industry and academic institutions. Ontario is investing in an aggressive innovation agenda to ensure it is one of the winning economies in the twenty-first century. Supported by close to $3 billion in spending with a focus on seizing global market opportunities, this agenda builds on the strength of Ontario’s creative environment, diverse culture, highly skilled workforce, world-class education system and internationally recognized research community.

Innovation costs are low in Ontario. Recognizing that tomorrow’s economic growth depends on today’s investments, the province has developed a strategic Innovation Agenda focused on rapidly commercializing new discoveries and supporting research and commercialization across virtually every sector of the economy. Canada’s R&D tax incentive program is one of the most generous in the world; when tax credits are factored in, the after-tax cost of $100 in R&D spending can be reduced to less than $41.

HOME TO INTERNATIONAL INDUSTRY GIANTS

International business thrives in Ontario because multinationals have discovered the tremendous advantages of doing business here. As Canada’s manufacturing, R&D and financial centre, Ontario is the destination of choice for about 35% of the billions of dollars of international investment that pours into Canada each year. Six of the world’s largest automotive companies and eight of the world’s largest chemical companies are here.

The food and beverage processing industry is big business in Ontario: it’s the second-largest manufacturing sector in Ontario, following transportation, and the largest employer in Canada. A significant source of food for much of North America and Europe, Ontario is the third-largest food processing jurisdiction in North America, based on employment. The province has long been home to many of the world’s largest food processing companies. About 3,200 food and beverage businesses are registered in Ontario, including such international industry giants as Coca Cola, PepsiCo, Nestle, Kellogg Company, Ferrero, Kraft Foods Inc., General Foods Corporation, Campbell Company of Canada and H.J. Heinz Company.

Clustered near a diverse consumer population, our food processing operations are an integral part of a strong Ontario economy (Figure 2, page 10).

WORKING TOGETHER WITH INDUSTRY

Under the guidance of its director, Dr. G. Harvey Anderson, professor, Departments of Nutritional Sciences and Physiology, University of Toronto, the Program for Food Safety, Nutrition and Regulatory Affairs (PFSNRA) is enhancing R&D partnerships in academic settings; identifying and evaluating the scientific evidence required to address issues put forth by the membership; and serving as an information resource on food, nutrition and health. PFSNRA’s membership is currently made up of 15 of the world’s (and Canada’s) largest agri-food and food processing organizations. The associate director of the PFSNRA is Dr. Ian C. Munro, executive vice-president CANTOX Health Sciences International and professor, Department of Nutritional Sciences, University of Toronto. http://www.pfsnra.com.
Figure 2: Food Processing Plants in Ontario
An analysis of Ontario’s R&D excellence and commercialization capacity in food processing
KELLOGG COMES TO ONTARIO

In 2007, the Ontario government helped Kellogg open its first new North American manufacturing plant in more than 20 years. The province invested $9.7 million to support Kellogg’s new $97-million plant in Belleville, Ontario, which produces Mini-Wheats cereal. The government’s investment was part of the Advanced Manufacturing Investment Strategy (AMIS), which provided companies with repayable, interest-free loans for up to five years to support investments in technology and innovation. With 2009 sales of nearly $13 billion, Kellogg is the world’s leading cereal producer and a leading producer of convenience foods.28

CONFECTIONERY INNOVATION AT FERRERO CANADA

The Italian company Ferrero Group, which produces confectionery products, has established a plant in Brantford, Ontario. Ferrero received $1.7 million from OMAFRA’s Rural Economic Development (RED) program in 2006 for a recruitment and training strategy. In 2007, Ferrero also received approval for a $5.5-million Advanced Manufacturing Investment Strategy (AMIS) loan from the Ministry of Economic Development and Trade (MEDT). The financing supported a state-of-the-art $55-million Confectionery Centre of Excellence to introduce new processes and products. In 2010, a further $9.2 million loan supported additional strategic investment at the plant. The plant is the industrial Ferrero hub in North America and produces Tic Tac, Nutella and Rocher. 29

Ferrero is the world’s largest hazelnut buyer. OMAFRA is working with the University of Guelph to investigate Ontario’s capability of growing 4,045 hectares (10,000 acres) of hazelnuts to supply Ferrero.
Competitive Business Costs, an Exceptional Workforce and Livability

Ontario offers an excellent business environment that supports the growth of sophisticated, high-value-added companies. Ontario’s business taxes are competitive (see Figure 3): the combined federal-provincial corporate income tax rate of 34.12% for manufacturers is more than three percentage points below the U.S. average – and by 2012, it will be almost 10 percentage points lower. According to KPMG’s 2006 Competitive Alternatives study of international business costs, Canada’s business costs are the most competitive of the G7 countries (United States, United Kingdom, France, Germany, Italy, Japan and Canada). Salary expectations, utility rates, construction costs and other factors all help to keep costs low in Ontario.

Ontario is constantly streamlining regulatory systems wherever possible. As part of Ontario’s Open for Business strategy – an ongoing plan to make government faster and friendlier for businesses – the government is on track to reduce the amount of regulation in Ontario by 25% by March 2011. Site permitting happens much more quickly in Ontario than in many jurisdictions. Business start-ups require only two simple steps here, compared with as many as 20 steps needed in other industrialized countries.

With food processing as one of its leading sectors, Ontario is making strides to increase the industry’s competitiveness. In 2007, the Ontario government cut business education taxes by more than $540 million over seven years to accelerate the elimination of the capital tax.

The Ontario workforce is

> **Well educated:** The percentage of workers who have post-secondary education is higher than in any other G7 country.

> **Skilled:** A network of 20 universities and 24 colleges train students in every field from the skilled trades to the most advanced areas of science, engineering and business.

> **Dependable:** Ontario workers average eight years on the job. In manufacturing, the on-the-job average is 10 years, which translates into lower training costs.

> **Ethnically diverse:** Ontario’s workforce speaks more than 100 languages, which means its members can work with your customers and suppliers in their own language, anywhere in the world.

Ontario is designed for global business success and the high quality of life that goes with it. The United Nations consistently ranks Canada as one of the best places to live in the world. Ontario’s population of more than 13 million is largely urban and well educated and has an international perspective. Toronto, the provincial capital, is one of the world’s most ethnically diverse cities.

The cost of living in Ontario is lower than in many comparable jurisdictions. The province provides high-quality, publicly funded, universal healthcare. Ontario’s public education system is excellent and its universities and colleges are ranked among the best in the world.

Ontario’s unique combination of quality of life and business advantages, and its reputation for innovation, are compelling reasons that investors choose Ontario for their global business expansion.

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**Figure 3: Ontario’s Corporate Income Tax Rates, 2009**

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<th>Type of Income</th>
<th>Federal</th>
<th>Ontario</th>
<th>Combined</th>
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<tr>
<td>General</td>
<td>19.0%</td>
<td>14.0%</td>
<td>33.0%</td>
</tr>
<tr>
<td>Manufacturing and processing</td>
<td>19.0%</td>
<td>12.0%</td>
<td>31.0%</td>
</tr>
<tr>
<td>Small business</td>
<td>11.0%</td>
<td>5.5%</td>
<td>16.5%</td>
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Source: Deloitte (6/2009)
A FLOURISHING FOOD PROCESSING INDUSTRY
Ontario’s Agri-Food Cluster

With annual sales totaling $34 billion, Ontario is one of North America’s largest and most significant food and beverage processing regions (Figure 4). Approximately 3,200 food processing companies, including multinationals, homegrown giants and successful niche-driven businesses, are located throughout the province, with a concentration along the major transportation corridors.

Figure 4: Food and Beverage Processing in Ontario

A cluster initiative consists of a group of private corporations, government agencies, research groups and academia that distinguish themselves by appearing as a formal organization through collaboration. In Europe, several agri-food cluster initiatives have formed. The Toronto-Guelph region of Ontario is well positioned to be the first agri-food cluster initiative in North America, according to a 2009 report commissioned by the Toronto Region Research Alliance.

Ontario’s agri-food cluster demonstrates a range of valuable attributes, which are discussed in the sections that follow.

A Hub of Innovative Food Companies

Ontario’s highly sophisticated food processing companies are a good mix of small, medium and large food establishments and are complemented by excellent conventional and organic farmers. The majority of food processors are located close to large urban centres (keeping transportation costs low) and are able to easily serve Ontario, the United States and international markets.

Easy Access to Quality Ingredients

From competitively priced sugar to high-quality beef, Ontario has a great diversity of first-class ingredients to draw from. The province has 57,211 farms, including more than 669 certified organic farms, on which more than 200 agricultural commodities are grown.

In addition to providing easy access for imports from around the world, Ontario produces a broad mix of crops and livestock. Major field crops include corn, barley, soybeans and various types of wheat. Livestock production includes beef, pork, sheep, poultry and eggs. This diverse mix and a focus on emerging customer needs allow Ontario to thrive in both commodity and niche markets. The dairy sector, for example, accounted for total farm cash receipts of $4.8 billion in 2006, including sales of milk, cream, cheese, yogourt and a range of specialty products.
The unique blend of climate, geography and soils found in certain areas of Ontario allows producers to grow a variety of top-quality fruits (including apples, grapes, tender fruits and berries) and vegetables (including tomatoes, spinach, cucumbers and corn). Ontario’s commercial fruit producers grow more than 409,000 metric tons (450,900 tons) of fruit annually on 25,294 hectares (62,502 acres) of land. The total farm gate value is more than $225 million.47

Ontario’s field vegetables were worth $274.5 million in 2007.48 Ontario is also a leader in the production of greenhouse vegetables: 654 greenhouse vegetable growers in Ontario account for 56% of total greenhouse vegetable sales in Canada.49

Specialty crops flourish in Ontario’s fields: from nutritious pulses, such as white beans and coloured beans, to Asian vegetables, herbs and mushrooms, Ontario has it covered. As an example, Ontario is North America’s largest grower of American ginseng, with about 220 growers and more than 2,025 hectares (5,000 acres) under cultivation.50

Bok choy (above) and ginseng (right) are just a couple examples of specialty crops grown in Ontario.

QUICK FREEZE INVESTMENT

In 2009, an Individual Quick Freeze (IQF) facility in Delhi, Ontario, received about $1 million from the Ontario government to establish a state-of-the-art food-processing plant that would allow farmers to process locally grown fruits and vegetables in frozen and freeze-dried formats.51

Dryer unit and freezer belt at Naturally Norfolk’s new state-of-the-art facility located in Delhi, Ontario.

GOVERNMENT SUPPORT

The federal and provincial governments provide funding programs and resources that contribute to the competitiveness of Ontario’s food and beverage processing industry. OMAFRA’s Business Development Branch supports the economic development of Ontario’s food and beverage processing in domestic and international markets through investment retention and attraction. The Branch works with firms that locate in the province to provide them with the knowledge, connections and resources they need to make informed management decisions. Ontario Food Exports (OFEX), a unit of OMAFRA, assists the food processing sector in increasing sales revenue by identifying and maximizing their export opportunities.
PRODUCTIVITY-FOCUSED BUSINESS CLIMATE

WORLD-CLASS RESEARCHERS AND INSTITUTIONS

Ontario is a world leader in food technology research and development. The University of Guelph is renowned for its significant contribution to agricultural science through its distinguished research and education. Scientists at the universities of Guelph, Ottawa, Toronto, Western Ontario, Carleton and Ryerson are undertaking groundbreaking research into food science and nutritional sciences, and research in culinary arts at George Brown College is developing the next generation of chefs to meet the needs of increasingly diverse populations and palates. OMAFRA’s Research and Innovation Branch and the Ministry of Research and Innovation provide demand-driven support for innovation and collaborations between industry and research.

COMMERCIALIZATION OPPORTUNITIES

Ontario is home to unique groups, including the Agri-Tech Commercialization Centre (BioEnterprise, Ontario Agri-Food Technologies and Soy 2020), Guelph Food Technology Centre (GFTC), Toronto Food Business Incubator, Vineland Research and Innovation Centre (VRIC), and multiple regional and sectoral innovation centres, which help Ontario manufacturers bring innovative agri-food products to market. (For more information on commercialization, see the section “Strength in Research and Innovation.”)

The many international food processing companies with operations in Ontario have discovered that the province offers a strong supply chain network that fosters efficiency and productivity. The province funds programs — including sustainability and environmental programs — to aid manufacturers in becoming more productive and competitive. The province is also funding research into the development of bioproducts, such as biofuels and bioplastics from renewable resources. The use of these products will reduce the environmental footprint of Ontario manufacturers in the future and enable them to meet the demands of retailers with sustainability programs, such as Loblaw, Metro and Walmart.

BOUNTFUL SUPPLY AND SUPPORT

Ontario food processors have convenient access to a bountiful supply of ingredients, primary and value-added processors, and specialty importers for manufacturing products. The flourishing food processing sector has encouraged growth in related services and industries, including warehousing, distribution, equipment, specialized storage and transportation. Thousands of Ontario companies provide same-day supply and support services, as well as innovative packaging. With Ontario’s producers, processing plants, retailers and transportation providers all located within close proximity, the sector enjoys convenient, natural opportunities for collaboration in such areas as distribution logistics.

Ontario’s food processing companies benefit from memberships in sector-specific associations, as well as umbrella organizations that provide a common voice on such issues as government policies, regulations and funding programs. (For more information on these groups, see the Appendices.)
SKILLED AND SPECIALIZED LABOUR

The food processing industry is the largest employer within the Canadian manufacturing sector. The industry employs more than 110,000 people directly and at least another 100,000 indirectly in Ontario. More than 55 university and college programs are available in agriculture, food science, nutritional science and culinary arts, and plans are in place to increase skilled labour in the food processing sector, with one-, two- and three-year college courses in food processing technology and a process operator apprenticeship.

The Institute of Food Processing Technology (IFPT), based in Kitchener, Ontario, was recently created through the collaboration of Conestoga College and the Alliance of Ontario Food Processors (AOFP), an organization representing some of the 3,200 members in the Ontario food and beverage processing sector. The IFPT shows industry’s strong commitment to building the capacity of Ontario’s food and beverage sector workforce. Set to open in September 2011, the IFPT curriculum will be based on skills development for plant floor equipment operation, with a specific focus on training technologists, technicians and skilled tradespeople. The long-term vision for the Institute is to become Canada’s preeminent institution for the development of a highly skilled workforce for the food and beverage manufacturing industry.

HIGH QUALITY STANDARDS

Quality is in Ontario’s nature. The province is a leader in food safety, quality standards and traceability, thanks in part to the agri-food industry and the federal, provincial and municipal governments, which work together to ensure a strong provincial food safety system. Under the Food Safety Research Program, the Government of Ontario has collaborated with industry for the past ten years to support and disseminate food safety research. Food safety training programs are available for food processing employees through service providers and government. The only one of its kind in Canada, the Guelph Food Technology Centre (GFTC) provides food processors around the world with services in food safety training, consulting and auditing, among other services, all targeted to their needs. The GFTC was formed 15 years ago with provincial funding and is now an independent food technology centre.

The Institute of Food Processing Technology (IFPT) will open September 2011 in Kitchener, Ontario.
INNOVATIVE PACKAGING AND COLD CHAIN

Packaging plays a critical role in the Ontario food distribution chain, ensuring that products remain safe from the time they are produced until they reach the consumer’s table. In the global food marketplace, with greater shipping distances and less-than-predictable transportation conditions, the quality of food packaging is even more vital. Better packaging and effective, timely, temperature-controlled shipping means less spoilage for the food industry and improved food safety for consumers.

Among consumers and businesses, environmental awareness is rapidly growing and leading to a major shift to greener products that depend less on petro-chemicals for their manufacturing, have lower carbon footprints, are biodegradable or compostable, or have a lower toxic profile. Ontario is keeping pace with the trend toward greener packaging. The Packaging Association of Canada (PAC), based in Toronto, is developing initiatives to support the sustainable packaging movement in Canada. In February 2010, 18 sustainability innovators met with eight of Canada’s leading retailers and food companies to work together on innovative packaging solutions.57

INTELLIGENT FOOD PACKAGING

With funding from the Ontario Research Fund, a program of the Ministry of Research and Innovation, scientists at the University of Guelph are developing and testing innovative, “intelligent” food packaging technologies and new biodegradable packaging materials. Their goal is to develop a new packaging material that extends the shelf life of milk, wine and other liquids. They are using tiny nano-fibres, which are 50 to 500 times thinner than a human hair, and electro-spinning them to form a film that can be embedded with active ingredients. As a result, the film changes colour when exposed to oxygen or bacteria, which could indicate when a product has passed its best-before date. Researchers are also testing various natural by-products from corn and soy to find a biodegradable source for the tiny nano-fibres.58

Depicted at left are electrospun soy protein isolate fibres for controlled release of allyl isothiocyanate, a naturally occurring antimicrobial vapour, that can be used to extend the shelf-life of food.
Participants in Ontario’s agri-food value chain are early adopters of new technology and keen to meet market demands. Many buyers from the United States, Europe, Latin America and Asia continually choose to source products from here because Ontario suppliers are also known for being ahead of the curve with foods trends, such as health and wellness, and organics products. Ontario suppliers have an excellent reputation for flexibility and customer-focused service and have proven experience with smaller, custom runs. Ontario’s ability to serve specialty markets, combined with its agricultural diversity, has positioned the province for success in key growth markets in food processing, including private label and functional foods. The ethnically diverse population in the Greater Toronto Area provides the background and experience to develop authentic products for the growing ethnic market in North America and can serve as a superb launch site or test market. Ontario’s multicultural society also provides the knowledge and contacts in emerging markets to enable businesses to take advantage of export opportunities.

FUNCTIONAL FOODS/HEALTH AND WELLNESS MARKET

Ontario’s functional food market is growing in the research and development labs of multinational and small companies alike, in academic research facilities and on Ontario farms. Driven by consumer demand, foods for health products are being researched, developed, produced and manufactured in Ontario for domestic and international sale.

Long-term market growth areas in which Ontario is equipped to excel include developing value-added foods and beverages. New research has resulted in the development of functional foods for consumers around the globe who are aging and interested in the potential of food to prevent certain chronic diseases and to improve their lives. Consumers want products that are personalized and that fit their lifestyle. Growing demand has spurred a global functional foods market that is estimated to be worth more than $60 billion. Despite the impact of the recession of 2008, that market is expected to continue to grow by 5% to 8% per year, according to Circadia Ventures LLP.59

Ontario is very innovative in supporting specialty crops, such as sweet potatoes, ginseng, sea buckthorn and bitter melon. Functional food research draws on the province’s agriculture as a source for natural compounds and functional ingredients, such as isoflavones in soybeans, lycopene in tomatoes and lutein in spinach. Over the past decade, Ontario-based research has enhanced the understanding of the potential for probiotics and soluble fibres to be consumed in a variety of food forms and has led to the commercial development of both omega-3 eggs and DHA-enhanced milk.

PRIVATE LABEL

Canada boasts the strongest private label market in North America: retailers’ own label products account for 36% of Canadian shoppers’ total dollars spent,60 compared with 21.5% in the United States.61 The private label market in the United States is underdeveloped and provides a huge opportunity for increasing sales to U.S. retailers. Ontario suppliers have proven experience producing and selling private label products in Canada, such as leading North American retailer Loblaw’s President’s Choice brand, and they are an excellent source of private label product supply for international retailers.
STRENGTH IN RESEARCH AND INNOVATION
Ontario has a reputation for excellence and innovation in agri-food research (see Figure 5, page 25). The type of food research taking place in Ontario is wide-ranging, encompassing areas from functional ingredients to ethnic vegetables to mealtime and consumer behaviour to nutrigenomics, food technology and food safety.

**Universities and colleges.** Ontario’s extensive network of universities and colleges provides leading-edge food and nutrition programs that are among the best in North America. Universities offer fully accredited agri-food, food science and food safety nutrition programs, among others, and are the sites for human clinical trials. Colleges offer applied training in culinary skills, food processing, food safety and more.

**A SAMPLE OF HUMAN CLINICAL TRIAL FACILITIES IN ONTARIO**

- Human Nutraceutical Research Unit, University of Guelph
- Risk Factor Modification Centre, St. Michael’s Hospital/University of Toronto
- Canadian Research and Development Centre for Probiotics, St. Joseph’s Hospital/University of Western Ontario

**Industry-driven research and training.**

- The Vineland Research and Innovation Centre in the Niagara Region is an emerging centre providing world-class research and commercialization support in horticultural science and innovation. The province of Ontario has invested more than $25 million in Vineland.
- Both OMAFRA and the Advanced Foods and Materials Network (AFMNet) fund industry-driven research and scholarships to develop future research and workforce capacity in agri-food areas.
- The newly established Ontario Institute of Food Processing Technology (OIFPT), which offers advanced training and applied research that supports a competitive and sustainable food and beverage processing industry, was created by the Alliance of Ontario Food Processors and Conestoga College.

**Government research centres.** The Guelph Food Research Centre, one of Agriculture and Agri-Food Canada’s (AAFC) network of 19 research centres, focuses on food safety, quality and nutrition. Another AAFC research centre, the Greenhouse and Processing Crops Research Centre in Harrow, Ontario, develops and transfers new technologies for the production of greenhouse vegetables, field-grown processing vegetables and edible beans.

Dr. Michael Brownbridge, research director, Horticultural Production Systems, in the Vineland Research and Innovation Centre greenhouse working on successful biocontrol strategies.
RESEARCH AND INNOVATION ACROSS THE PROVINCE

**Kemptville Campus.** Located less than an hour’s drive south of Ottawa, the University of Guelph, Kemptville Campus, is the site of a broad range of research projects focusing primarily on the crop and dairy industries in Eastern Ontario. The Food, Nutrition and Wellness Unit has participated in such projects as the Total Diet Study, in partnership with Health Canada.

Kemptville expanded to include research stations at Emo, Winchester and New Liskeard, Ontario. The **New Liskeard Agricultural Research Station (NLARS)** operates three stations in northern Ontario. The Horticultural Unit is dedicated to berry crop and vegetable cultivar evaluation.

**Agricultural Research Institute of Ontario (ARIO).** This corporate body reports directly to the Minister of Agriculture, Food and Rural Affairs to set priorities and provide direction for research activities that will contribute to prosperous, competitive and sustainable agriculture, food and rural sectors in Ontario. ARIO oversees operations of 17 agricultural research stations and colleges (not all shown here).
Ontario’s Research Talent

Scientist Profiles

Milena Corredig, BSc, MSc, PhD

Canada Research Chair in Food Nanostructure
Natural Sciences and Engineering Research Council of Canada (NSERC)/Ontario Dairy Council
Industrial Research Chair in Dairy Technology
Professor, Department of Food Science, University of Guelph

Working in the lab with a team of 30 researchers, Milena Corredig is focused on the physical chemistry of foods, specifically on finding ways to make milk and dairy products more healthful by altering proteins, forming new structures with milk ingredients or adding more fibre. Her research increases the range of dairy products that processors can make and offers consumers new tastes and textures, and added nutritional value. Since adding fibre or other healthful ingredients to milk products tends to affect their texture, Dr. Corredig controls the assembly of the structures at the nano or microscopic level. She works closely with R&D groups primarily within the dairy industry who use her findings to make substantial improvements to their products and processes, saving them millions of dollars and helping them make capital investments. In 2008, Dr. Corredig received the American Dairy Science Association (ADSA) Foundation Scholar Award in Dairy Foods.

Bruce Holub, PhD

University Professor Emeritus, Department of Human Health and Nutritional Sciences, University of Guelph

Bruce Holub has been active in the evaluation of nutraceuticals and agri-foods for improving human health, preventing and managing disease, and providing potential cost-savings in the healthcare system. Dr. Holub is world-renowned for his research on the role of omega-3 fatty acids docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA) in preventing cardiovascular disease. He has also studied trans fatty acids, and maintains active collaborative research with clinical groups at Canadian medical schools; at the Mayo Clinic in the United States; in Japan and Greenland; and in the agri-food sectors. Dr. Holub has been an advisor to industry in the development of internationally sold products, such as DHA/EPA-enriched orange juice, bread, milk, eggs and yogourt. He also serves as scientific director for the DHA/EPA Omega-3 Institute (http://www.dhaomega3.org). In 2006, Dr. Holub received the Danone Institute Distinguished Nutrition Leadership Award to recognize his significant contribution to the field of nutrition.
DAVID JENKINS, MD, PhD

Canada Research Chair in Nutrition and Metabolism
Professor, Department of Nutritional Sciences, University of Toronto
Director, Risk Factor Modification Centre, St. Michael’s Hospital, Toronto

David Jenkins is world-renowned for his research on the potential of foods to prevent and treat chronic diseases, primarily heart disease, cancer and diabetes. His studies have focused, for example, on the glycemic index of foods, including the use of low-glycemic-index diets to manage diabetes. Dr. Jenkins is also studying the dietary portfolio of foods with cholesterol-lowering actions (soy, viscous fibres, oats, barley, plant sterols and nuts) demonstrating that the right diet can lower cholesterol as effectively as first-generation cholesterol-lowering medications. Working in collaboration with the food industry on a diverse spectrum of products and food components, Dr. Jenkins teamed with Loblaw Companies Limited to develop their President’s Choice Blue Menu product lines and with Kellogg on the production of Bran Buds with cholesterol-lowering psyllium. In 2010, Dr. Jenkins received the Khursheed Jeejeebhoy Award from the Canadian Nutrition Society for best application of clinical nutrition research findings to clinical practice.

ULRICH KRULL, BSc, MSc, PhD, FCIC

Professor, Department of Chemical and Physical Sciences, University of Toronto
AstraZeneca Chair in Biotechnology

Ulrich Krull specializes in the technology of biosensors to detect low-level DNA markers for pathogens. The technology he is developing provides rapid screening in the field or in the processing plant; for example, it can be used by growers and processors to detect and identify the DNA or RNA of bacteria or viruses, such as Listeria and the hepatitis A virus, in food products. In 2002, Dr. Krull received the Maxxam Award from the Canadian Society for Chemistry for his DNA biosensor work.

STEVEN LEESON, DPT, MPhil, PhD

Professor, Department of Animal and Poultry Science, University of Guelph

A pioneer in functional food research, Steven Leeson has focused his studies on incorporating omega-3, DHA and lutein into eggs to provide additional nutrients for human consumption and to target health ailments from arthritis to age-related eye disease. Dr. Leeson has been recognized with the American Feed Industry Association Poultry Nutrition Research Award and the Ontario Agricultural College Distinguished Researcher Award. Dr. Leeson is also working on a scholarship program with OMAFRA to enhance market readiness among graduate students studying agri-food and other disciplines at the University of Guelph.
ISABELLE LESSCHAEVE, Ag Eng, PhD
Research Director, Consumer Insights and Product Innovation, Vineland Research and Innovation Centre

An engineer in agriculture with a PhD in food science from the University of Burgundy, France, Isabelle Lesschaeve has 20 years of experience in sensory and consumer sciences, with a focus on food and beverages. A well-recognized expert in her field, she has conducted multidisciplinary research in both academic and corporate environments with the goal of understanding consumer preferences, consumption and purchasing behaviours for wine, food, vegetables and ornamental plants. Dr. Lesschaeve and her research team are working with the whole value chain to provide insight for innovation, increase margins and expand the markets.

ALEJANDRO MARANGONI, BSc, PhD
Canada Research Chair in Food and Soft Materials Science
Professor, Department of Food Science, University of Guelph

For 19 years, Alejandro Marangoni has been studying the material science of fats and oils, creating novel ways to restructure them that allow the same functionality as unhealthful trans fats and hydrogenated and saturated oils. Dr. Marangoni works with small and large food processing companies to create shortening and oil alternatives that match and exceed the characteristics of less healthful fats in their products, without sacrificing taste and texture. In 2008, Dr. Marangoni was the recipient of the Guelph Partnership for Innovation Innovator of the Year Award.
Gregor Reid, BSc, MBA, PhD

Professor, Departments of Microbiology and Immunology, and Surgery, University of Western Ontario
Chair in Human Microbiology and Probiotics, and Director, Canadian Research and Development Centre for Probiotics
Assistant Director International, Lawson Health Research Institute

Probiotic research pioneer Gregor Reid’s work focuses primarily on the role of beneficial bacteria and probiotics on health in the female urogenital tract. Dr. Reid provides advice on probiotic product development to companies, including Danone, which donated $7 million for his Chair in Human Microbiology and Probiotics, the largest endowed probiotics chair in the world. The former president of the International Society for Probiotics and Prebiotics, Dr. Reid was inducted as a Fellow into the Canadian Academy of Health Sciences. In 2010 Dr. Reid was awarded the Hellmuth Prize for advancements in probiotics, the University of Western Ontario’s highest distinction for sustained excellence in research.

Koushik Seetheraman, PhD

Industry Research Chair in Cereal Science and Technology
Associate Professor, Department of Food Science, University of Guelph

With a research team of 20 in the lab, Koushik Seetheraman is helping to design more healthful grain-based products and widen markets for grain farmers and processors across Ontario. With $1.1 million in funding from the Ontario Cereals Industry Research Council (OCIRC), the Agricultural Adaptation Council and the University of Guelph, Dr. Seetheraman is developing tools to help understand and improve the functionality of cereal proteins. Learning about the differences in protein networks in grain-based products is important for growers, processors and consumers, and has the potential to improve the next generation of wheat crops. A consultant to the cereals industry and graduate of Gujarat Agricultural University in India, Cornell University and Texas A&M University, Dr. Seetheraman was on the faculty at Penn State before arriving at the University of Guelph.
VLADIMIR VUKSAN, BSc, MSc, PhD
Professor, Departments of Medicine and Nutritional Sciences, Faculty of Medicine, University of Toronto
Associate Director of Clinical Trials, Clinical Nutrition and Risk Factor Modification Centre, Division of Endocrinology, St. Michael’s Hospital, Toronto

Vladimir Vuksan has many years of experience in the development of alternative remedies and new treatment modalities, as well as functional foods, nutraceuticals and herbal medicine for the prevention and treatment of diabetes, obesity and heart disease. Dr. Vuksan pioneered research on American ginseng, which is grown in Ontario; his 2000 study published in the *Archives of Internal Medicine* on ginseng’s glucose-lowering effects generated international press and public interest. His discoveries have been transferred into mainstream commercial products, such as the viscous fibre blend commercially known as PGX, which helps reduce blood sugar and slow sugar absorption, improving diabetes, metabolic syndrome and cholesterol levels.

RICKEY YADA, PhD
Canada Research Chair in Food Protein Structure
Scientific Director, Advanced Foods and Materials Network (AFMNet)
Professor, Department of Food Science, University of Guelph

Rickey Yada’s research focuses on the genetic engineering of milk-clotting enzymes and factors that regulate processability in potatoes. Dr. Yada and his research team have spent years identifying the metabolic pathway of the potato and the way it breaks down in storage. They introduced a gene from an unrelated plant that has an effect on the potato’s metabolism. The result: a cloned potato that is resistant to low-temperature sweetening, the natural metabolic occurrence in potatoes stored in cool temperatures that creates an inconsistent taste and colour when fried into potato chips. Dr. Yada’s research could have significant implications for the snack-food industry, diet-conscious consumers and those with diabetes. A former member of the Royal Society of Canada Expert Panel on the Future of Food Biotechnology, Dr. Yada is currently the North American editor for *Trends in Food Science and Technology*. 
Ontario researchers are leaders in the field of food research. Here’s a sampling of recently completed and ongoing studies in functional foods and food safety.

**FUNCTIONAL FOOD RESEARCH**

1. **Enhancement of breads to optimize carbohydrate management in adults with type 2 diabetes** (Terry Graham, Lindsay Robinson, Alison Duncan, Department of Human Health and Nutritional Sciences, University of Guelph). In this ongoing project, researchers have been studying adults with type 2 diabetes as they consume different breads to determine the short-term responses of critical, blood-borne disease risk factors. They’ve found that the quality of carbohydrates in bread can significantly affect the glycemic response to it. The study results suggest that consuming sourdough bread had a favourable metabolic response when compared with white bread. These findings could give direction to the Ontario baking industry for product development and provide data to support health claims for bread.

2. **Fibre-fortified dairy products: effects on nutritional and functional properties** (Douglas Goff, Milena Corredig, Department of Food Science, University of Guelph). For this ongoing study, researchers are assessing the nutritional benefits of fibres, notably from flax, soy and an in situ developed exopolysaccharide (EPS) from lactic acid bacteria (LAB), when used in dairy products. They’re examining the modulating effects of fibre-fortified fluid and gelled dairy products on the glycemic index in human clinical trials and on in vitro colonic fermentation and the production of volatile fatty acids (VFAs). This project will demonstrate the specific health benefits of fibre fortification of fluid and gelled dairy products by using three novel polysaccharides. The results of this study will provide the industry with specific knowledge to aid product development initiatives.

3. **Tomatoes and tomato-based foods in combination with other micronutrient-rich foods reduce the incidence of prostate cancer** (Vasundara Venkateswaran, Department of Surgery, University of Toronto; Laurence Klotz and Linda Sugar, Sunnybrook Health Sciences Centre, Toronto; Neil Fleshner, Princess Margaret Hospital, Toronto). For this study, published in *Cancer Prevention Research* in 2008, scientists set out to find the right combination of micronutrients and the right intervention time to best reduce the incidence of prostate cancer and increase survival times in those already diagnosed. The researchers found that the early start of a unique micronutrient combination of vitamin E, selenium and lycopene, which is found in tomatoes, reduced the incidence of prostate cancer in the preclinical mouse model. Lycopene may work as a catalyst to optimize the antioxidant performance of vitamin E and selenium or to cause the death of cancer cells. If proven further through ongoing clinical trials, this early intervention of the micronutrient combination may have the potential to reduce the incidence of prostate cancer.

**DIABETES PREVENTION AT ONTARIO COLLEGES**

A project at the Centre for Hospitality and Culinary Arts at George Brown College in Toronto is helping Ontarians at high risk for type 2 diabetes within various ethnic communities. With more than $110,000 in funding from George Brown and the Natural Sciences and Engineering Research Council (NSERC), the three-year project is being spearheaded by Professor Sobia Khan and her students in the culinary management nutrition program. They are recruiting clients with diabetes from the South Asian, African, Hispanic, Chinese and West Indian communities, and asking them to share their favourite traditional ethnic recipes. Working in collaboration with the Canadian Diabetes Association, the George Brown team then conducts a nutritional analysis on each recipe and modifies it to make it diabetic-friendly by using fresh Ontario ingredients.
4. **Optimization of oat and barley beta-glucan bioactivity in cereal-based bakery products** (Koushik Seetheraman, Department of Food Science, University of Guelph; Peter Wood and Susan Tosh, Guelph Food Research Centre). Researchers are investigating why beta-glucan (a soluble fibre derived from the cell walls of yeast that promotes a healthy immune system) breaks down in wheat-based baked goods. Preliminary results suggest that wheat contains beta-glucanic enzymes that are responsible for the breakdown of the beta-glucan molecules. The researchers are currently developing strategies to maintain the fibre's functional structure in baked products by inactivating these enzymes to help support product structure and further health claims in Canadian foods.

**FOOD SAFETY RESEARCH**

1. **Biocontrol of *Salmonella* in developing tomato fruit by using a combination of lytic bacteriophage and antagonistic bacteria** (Keith Warriner and Kari Dunfield, Department of Food Science, University of Guelph; Magdalena Kostrzynska; Agriculture and Agri-Food Canada). It has been demonstrated that *Salmonella* introduced onto the blossom of tomato plants can contaminate the subsequent fruit both externally and internally; once internalized, it cannot be removed by washing and hence it represents a significant food safety risk. The researchers evaluated the efficacy of an alternative approach: applying an antagonistic bacteria and a lytic bacteriophage to the blossom of tomato plants. They found that this biocontrol preparation reduced *Salmonella* population, offering a potential way to control *Salmonella* in the field.

2. **A novel carbohydrate-based capture method for the isolation and concentration of noroviruses** (Kirsten Mattison, Research Scientist, Health Canada). Noroviruses (NoV) are the leading cause of non-bacterial gastroenteritis. To control the spread of NoV disease, it is important to have effective methods of detecting foreign materials in food items. Since NoV are infectious at low levels (10 to 100 viral particles), the methods developed must have a high degree of sensitivity. In this study, the researchers developed a sensitive detection method for NoV in foods based on the natural carbohydrate receptor for the virus, testing the method with four types of food (lettuce, green onion, strawberries and ham) and nine virus strains. This method will give facilities an option for rapid diagnostic testing of food in Ontario. The researchers hope that when contaminated foods can be accurately identified and the source of contamination pinpointed, the financial losses associated with NoV contamination will be reduced.

**REDUCING SODIUM IN PROCESSED FOODS**

Salt is valued by food processors because it increases the sensory appreciation of food by enhancing flavour. It can also be an effective antimicrobial preservative and is important for the proper processing of many foods, such as bread and cheese. However, when consumed in excess amounts, salt increases the risk of health problems, such as hypertension, cardiovascular disease and stroke. Dérick Rousseau, a professor in the Department of Chemistry and Biology at Ryerson University, is leading a group of Canadian researchers in developing strategies aimed at reducing salt in common processed foods by 25% to 30% while maintaining the desired salty taste. Instead of taking the typical approach of replacing sodium chloride in foods, Rousseau and his team are using a tactic commonly employed in the pharmaceutical industry called controlled release. This approach should lower the salt content but still allow the taste buds to perceive ample saltiness. This research is primarily funded by AFMNet, with support from the Canadian Stroke Network and two industrial partners.
The discoveries made by Ontario scientists are being successfully transformed into commercial products through private food processing companies and industry organizations. These products are just a few examples of successful technology transfer:

1. **A world first: DHA-enhanced milk.** Brian McBride and Tom Wright, researchers in the University of Guelph’s Department of Animal and Poultry Science, discovered a way to enhance cows’ health — and the nutritional properties of the milk they produce — with a specially formulated natural feed supplement. The final product is a world first: in 2004, Neilson Dairy introduced Neilson Dairy Oh!, a fresh milk developed to help combat the deficiency of omega-3s in the Canadian diet. Each serving of Neilson Dairy Oh! contains 10 to 20 milligrams of DHA, an omega-3 fatty acid, that supports normal development of the brain.

   Researchers worked with various government-approved natural feed ingredients and discovered properties in some combinations that protect the DHA in the digestive system, allowing cows to naturally produce DHA-enhanced milk.

   The result is a functional food that was successfully brought to market and a better understanding of optimum nutrition for dairy herds. Neilson Dairy Oh! is available in a variety of packaging formats.

   A Canadian cheese company has brought DHA-enhanced cheese to market, made with DHA-enhanced milk.

2. **Functional eggs.** Premium eggs available at Canadian grocery stores are rich in omega-3s, DHA and even lutein. They’re designed to provide additional nutrients for human consumption and potentially target a host of human health challenges, ranging from arthritis to macular degeneration. Much of the research that made these functional foods possible has come from scientists in Guelph, Ontario.

   University of Guelph researcher Steven Leeson and his team set out to test how certain fats held up in a hen’s digestive system. They experimented with feeding hens flax — the most affordable source of omega-3 fatty acids. The more flax a hen ate, the higher the omega-3 content of her eggs. Leeson’s team incorporated vitamin E into the hen’s diet and worked out an optimal balance that would produce eggs with meaningful levels of omega-3s.

   The research continued and progressed to working with DHA — a specialized form of omega-3s — in the form of fish oil. The team experienced similar success in producing DHA-rich eggs. Today, omega-3 and DHA eggs from Ontario’s Burnbrae Farms are available in grocery stores.
More recently, Leeson’s team turned its attention to lutein, a nutrient that has been linked to improvements in macular degeneration, a common age-related eye disease. Leeson’s team is developing a lutein-rich variety of grain corn, which would allow for a domestic feed source of lutein. As with the omega-3 eggs, these new products will go a long way in serving a functional food market hungry for foods with higher nutritional value.

Thompson’s Limited, an Ontario supplier of corn, soybeans, wheat and dry beans, is one of the companies delivering IP soybeans in the province. With 12 locations across Canada, Thompson’s serves as the vital supply chain link between farmers who grow premium soybeans and their end-users in the domestic and international marketplace. During the evolution of the soybean IP system, Thompson’s and other companies partnered with farmers in Ontario to meet their needs.

Ontario farmers produce the majority of soybeans in Canada by using a system that allows for the segregation of different soybean varieties for various end-use markets. The system evolved to be able to guarantee complete traceability of each soybean shipment, from the type of seeds that were planted to how it was grown, harvested and shipped to its end user.

When new technology began to flood the soybean market in the late 1990s, customers were willing to pay premiums to ensure they got the products they wanted. And since strong business relationships, an infrastructure and the traceability system was already in place in Canada, Canadian soybean farmers were able to achieve a competitive edge in a niche market that they still enjoy today.

3. **Guaranteed traceability.** Traceability in a supply chain is a make-or-break link for successful food and beverage processing businesses around the world. In Ontario, farmers and businesses have a solid track record with their development of, and participation in, Canada’s world-class Identity Preserved (IP) system for soybeans, which provides peace of mind to soy food and beverage processors worldwide.
The following Ontario organizations and networks offer the programs, facilities and expertise to help Ontario researchers, food producers and processors take their innovative ideas to market:

> The **Advanced Food and Materials Network (AFMNet)** is Canada’s national food and biomaterials research network, designed to discover new ideas and develop biology-based technologies that will create commercial opportunities while improving the lives of Canadians. AFMNet’s multi-disciplinary teams of scientific researchers, professionals, industry partners and government agencies are working to improve the quality and nutritional value of foods. In the past five years, research funded by AFMNet has resulted in 490 peer-reviewed scientific publications, spurring groups to commercialize unique opportunities. [http://www.afmnet.ca](http://www.afmnet.ca)

> The **Agri-technology commercialization centre** houses a cluster of organizations that work to help producers, researchers and entrepreneurs in agriculture find capital and take their products to market. **Ontario Agri-Food Technologies (oAFT)** is a non-profit organization comprising members from grower associations, universities, industry and governments. Located in Guelph, Ontario, the organization focuses on ensuring that Ontario producers have access to the latest technologies to compete globally and to develop new market opportunities. **BioEnterprise Corporation** is a non-profit commercialization agent, established to help promote the creation, growth and expansion of businesses in the agri-food and agri-life sciences and bioproduct industries. **Soy 20/20** connects government, academic and industry partners to stimulate and seize new global bioscience opportunities for Canadian soybeans. [http://www.agritechcentre.ca](http://www.agritechcentre.ca)

> The **Guelph Food Technology Centre (GFTC)** is Canada’s only independent food technology centre. It provides creative, confidential technical solutions, training, consulting and auditing to the Canadian food value chain. Each year, GFTC assists more than 1,500 companies and trains more than 3,000 people. GFTC offers a comprehensive range of services to companies in the food and beverage industry, including product testing and development, technical packaging services and process development, nutritional labeling, food safety and quality systems, sustainability services and technical training programs. [http://www.gftc.ca](http://www.gftc.ca)

> **Regional Innovation Centres** are multi-stakeholder regional development organizations established with provincial funding that support partnerships among small- to medium-sized businesses, institutions and local governments to promote innovation. One of the benefits of these networks is that they can bring commercialization services closer to the clients that need them: small firms, researchers, entrepreneurs and investors. [http://www.oneinnovation.ca](http://www.oneinnovation.ca)

> The **Toronto Food Business Incubator (TFBI)** is an independent non-profit organization that nurtures and assists entrepreneurs and small enterprises. The organization helps new companies become established, with the goal of sustaining economic growth, creativity and the vitality of the food manufacturing industry. Member companies receive 24-hour access to a production space and fully equipped commercial kitchen. Hands-on experience is supplemented with training, field trips and mentoring. Member companies share TFBI’s network of industry contacts. [http://www.tfbi.ca](http://www.tfbi.ca)

> **Vineland Research and Innovation Centre.** This industry-led non-profit organization, specializing in horticulture research and commercialization, also offers incubator laboratory and office space to developing businesses. OMAFRA has provided Vineland with funding to act as a research hub for horticulture research in Ontario and eventually across Canada. [http://www.vinelandresearch.com](http://www.vinelandresearch.com)
CAPITALIZING ON
THE ONTARIO ADVANTAGE
Ontario is eager to have food processing companies invest here. The Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) welcomes firms and is the key contact to help grow a business investment. From business development to exporting services and information on finding research and financial support, OMAFRA works to foster success.

**OMAFRA’S BUSINESS DEVELOPMENT BRANCH,**
[HTTP://WWW.OMAFRA.GOV.ON.CA (CLICK ON FOOD)](http://www.omafra.gov.on.ca)

**Knowledge, connections and resources:** Making the move to Ontario successful and rewarding is the goal of our highly specialized food processing industry consultants. The Business Development Branch has worked with many food companies, supplying them with information to help with their business location analysis, such as land and labour costs, labour availability, shipping distances, utility rates, taxes, potential suppliers for ingredients, packaging and much more. The Branch can also compare some of these costs with those in other jurisdictions in North America.

And the support doesn’t end once a firm gets to Ontario. The Ministry’s Business Investment Development Unit has its own team of consultants who visit plants and work with staff to maximize productivity. Consultants are equipped with an in-depth knowledge of the needs of the industry gained through working with major industry associations, and they are well versed in Canadian government food manufacturing regulations. They attend key trade shows, conferences and conventions to make sure they are knowledgeable and up to date on the latest information.

**Expanding exports:** The Business Development Branch’s OFEX program helps the food and beverage sector to increase sales revenue by identifying and maximizing export opportunities. Experienced export marketing and geographic specialists provide informal direction and market intelligence to expand exporters’ sales bases. Export marketing officers have extensive experience in food processing and cover all the major food sectors. Geographic officers facilitate buying opportunities for Ontario exporters, promote Ontario products to the world and provide on-the-spot market insights for Ontario suppliers. OFEX coordinates events that bring buyers and Ontario suppliers together. Trade missions connect pre-qualified Ontario suppliers with key decision makers from the United States, Europe, Asia and Latin America. Practical, hands-on seminars help new and experienced exporters navigate export regulations, understand channel distribution and outline the opportunities for success, whether the company is exporting to the United States or internationally. OFEX provides the actionable market intelligence needed to understand target markets and make sound business decisions.
Health claims, novel foods and ingredients: The objective of this initiative is to accelerate the market entry of new food products and advance innovation in the rapidly expanding category of foods with added health benefits. The initiative provides guidance and communication to key stakeholders regarding the regulatory system, generates science to substantiate health benefits and new claims for innovative food products and modernizes policy and regulatory approaches and pre-market processes. This is an initiative of the Growing Forward programs in the agriculture sector, which will receive $1.3 billion in funding over five years from the Government of Canada and the provincial and territorial governments. Growing Forward programs emphasize building a competitive, innovative and profitable agricultural sector that contributes to the priorities of increasingly health-conscious and environmentally aware Canadians.
FINANCIAL SUPPORT

TAX CREDITS

At the provincial level, Ontario has one of the most generous tax environments in North America for supporting corporate research and development and innovation. Food processors can access six general tax credits for research and development to encourage innovation:

> **Ontario Innovation Tax Credit.** A 10% refundable tax credit – up to $300,000 – on research and experimental development expenses

> **Ontario Business Research Institute Tax Credit.** A refundable tax credit of up to $4 million for corporations that partner with an eligible research institute for scientific and experimental development

> **Ontario Research and Development Tax Credit.** A 4.5% non-refundable tax credit for research carried out in Ontario

> **Ontario Tax Exemption for Commercialization.** A 10-year tax exemption for new corporations that commercialize intellectual property from eligible Canadian universities, colleges or research institutes

> **Ontario Retail Sales Tax Exemption on Research and Development and Manufacturing Equipment.** A federal tax-incentive program to encourage Canadian businesses to conduct research and development in Canada that will lead to new, improved or technologically advanced products or processes

> **Scientific Research and Experimental Development (SR&ED) Tax Credits.** A federal tax-incentive program to encourage Canadian businesses to conduct research and development in Canada that will lead to new, improved or technologically advanced products or processes

FUNDING PROGRAMS

Through both private and public programs, OMAFRA can help your company source funding and support for

> workforce development

> business growth and cost management

> infrastructure development

Below are just a few of the many financial programs available to help support the growth of food processing companies in Ontario:

> **The Industrial Research Assistance Program (IRAP).** This widely used program provides financial support and consulting services to Canadian companies in all industry sectors to encourage the development of innovative products, processes and technology. IRAP’s 240 technology advisors – mostly engineers and scientists with at least 10 years’ industry experience – provide advice and may provide eligible companies with funding to help strengthen technological abilities, improve production and processes, conduct market research, gather competitive intelligence and access or adapt new technology. For more information, call 1-877-994-4727 or visit http://www.omafra.gov.on.ca.

> **Premier’s Award for Agri-Food Innovation Excellence.** This $2.5-million award program recognizes Ontario innovations that add value to existing products, create jobs and drive economic growth. Each year until 2011, up to 55 regional award winners will each receive a cash prize of $5,000. From these winners, a Minister’s Award of up to $50,000 and a Premier’s Award of up to $100,000 will be selected. For more information, call 1-877-424-1300 or visit http://www.omafra.gov.on.ca.
> **Rural Economic Development (RED) Program.** Just outside Ontario’s urban metropolis areas are many business-ready rural communities. The RED program helps rural communities thrive and grow by supporting projects that remove barriers to economic growth. For more information, contact the Rural Economic Development Program at OMAFRA at 1-888-588-4111 or send an e-mail to red.omafra@ontario.ca.

> **OMAFRA’s Research Funding Programs.** OMAFRA has allocated more than $10 million in annual research funding to universities, institutions and industry through targeted demand-driven research programs. Much of the research that OMAFRA funds is led by the University of Guelph under the OMAFRA/University of Guelph Agreement, but significant research is also conducted under the competitive New Directions and Food Safety Research programs. For more information, contact the Research and Innovation Branch at 1-888-466-2372 ext. 64554 or send an e-mail to research.omafra@ontario.ca.

> For more information about funding programs, call OMAFRA at 519-826-3486, visit http://www.omafra.gov.on.ca (click on Funding & Resources and then Food Companies Funding and Support) or send an e-mail to foodinvest@ontario.ca.

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**Key Contacts**

| **Mr. John Swan** |
| Investment Attraction Consultant |
| 519-826-4447 |
| 1-888-466-2372, ext. 6-4447 (toll free in Ontario) |

| **Mr. Bill Harvie** |
| Investment Attraction Consultant |
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| 1-888-466-2372, ext. 6-4405 (toll free in Ontario) |

**Business Development Branch**

**Ministry of Agriculture, Food and Rural Affairs**

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For a list of international phone numbers to contact OMAFRA, visit http://www.investinontario.com/contactus.

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**Innovation and Knowledge Management Unit**

**Research and Innovation Branch Ministry of Agriculture, Food and Rural Affairs**

Local: 519-826-4554
Toll Free: 1-888-466-2372 ext. 64554 (toll free)
research.omafra@ontario.ca
http://www.omafra.gov.on.ca/english/research/kttiindex.htm
This appendix provides brief descriptions of some key association contacts in the food processing sector in Ontario, as well as partners in innovation for the sector. It also includes listings of research contacts serving academic research and industry-driven research. Finally, a section lists some government support resources specializing in food processing business and research support in Ontario.

**KEY FOOD PROCESSING ASSOCIATIONS**

The **Alliance of Ontario Food Processors (AOFP)** is a non-profit organization of food and beverage processing companies and industry organizations. Members have joined together to provide a comprehensive and coordinated approach to promoting and representing the Ontario food and beverage processing sector on issues of common interest and concern. [http://www.aofp.ca or 519-896-5967](http://www.aofp.ca):

**Food and Consumer Products of Canada (FCPC)** is the largest industry association in Canada, representing the food and consumer products industry. [http://www.fcpmc.com or 416-510-8024](http://www.fcpmc.com):

**Food Processors of Canada (FPC)** is an internationally respected business association serving food industry executives on matters concerning trade, commerce and manufacturing. The members of FPC own or manage food processing companies in Canada. [http://www.foodnet.fic.ca or 613-722-1000](http://www.foodnet.fic.ca):

**INNOVATION PARTNERS**

Ontario has a variety of innovation partners in addition to the processing associations listed above. From farm groups to grocers, these key value chain partners in the food industry help businesses meet their goals. Some are listed here, but for a more extensive listing, go to [http://www.omafra.gov.on.ca and click on The List](http://www.omafra.gov.on.ca):

The **Agri-Technology Commercialization Centre** is a single point of contact for entrepreneurs, researchers and companies (early-stage to multinationals) who are growing businesses in the cutting-edge fields of agriculture and biotechnology. [http://www.agritechcentre.ca or 519-821-2960](http://www.agritechcentre.ca):

The **Canadian Institute of Food Science and Technology (CIFST)** is the national association for food industry professionals. Its membership of more than 1,200 comprises scientists and technologists in industry, government and academia who are committed to advancing food science and technology. [http://www.cifst.ca or 905-271-8338](http://www.cifst.ca):

The **Guelph Food Technology Centre (GFTC)** is a global leader in food safety, training, quality and technical solutions. GFTC offers the most up-to-date knowledge to leading companies in the food and beverage industry. [http://www.gftc.ca or 519-821-1246](http://www.gftc.ca):

The **Packaging Association of Canada (PAC)** is a collaborative partnership to advance packaging for sustainability and food safety. [http://www.pac.ca or 416-490-7860](http://www.pac.ca):

**RESEARCH CONTACTS**

The **Advanced Foods and Materials Network (AFMNet)** is Canada’s national food and biomaterials research network, designed to discover new ideas and develop biology-based technologies that will create commercial opportunities while improving the lives of Canadians. [http://www.afmnet.ca or 519-822-6253](http://www.afmnet.ca):

Located in Ontario, the **Agriculture and Agri-Food Canada Research Centres** are four government-supported research centres that focus on food:

1. **Food Research Centre (Guelph)**, 519-829-2400
2. **Eastern Cereal and Oilseed Research Centre (Ottawa)**, 613-759-1858
3. Southern Crop Protection and Food Research Centre (London), 519-457-1470
4. Greenhouse and Processing Crops Research Centre (Harrow), 519-738-2251

Most notably, the Guelph facility specializes in food safety, quality and nutrition, while the Harrow facility develops and transfers new technologies for the production of greenhouse vegetables, field-grown processing vegetables and edible beans. For more information, visit http://www.agr.gc.ca/index_e.php and in the “Find” box, type “research centres Ontario”.

The Laboratory Services Division – University of Guelph is a multifaceted analytical and diagnostic laboratory that serves a broad range of agri-food and veterinary clients within government, commercial and academic sectors on a fee-for-service basis. http://www.uoguelph.ca/labserv/ or 519-767-6299

Universities and Colleges Doing Agri-Food Research:

> Carleton University, http://www.carleton.ca/
> Conestoga College, Institute of Food Processing Technology, http://www.conestogac.on.ca
> George Brown College, http://www.georgebrown.ca
> Lakehead University, http://www.lakeheadu.ca
> McMaster University, http://www.mcmaster.ca
> Ryerson University School of Nutrition, http://www.ryerson.ca
> Trent University, http://www.trentu.ca
> University of Guelph, http://www.uoguelph.ca
> University of Ottawa, http://www.uottawa.ca
> University of Toronto, http://www.utoronto.ca
> University of Waterloo, http://www.uwaterloo.ca
> University of Western Ontario, http://www.uwo.ca
> Algonquin College, http://www.algonquincollege.com

The Vineland Research and Innovation Centre is an independent, non-profit organization that was created to be a world-class centre for horticultural science and innovation. In its capacity to enable and foster relationships with industry, academia and government, Vineland works to deliver premium product and production innovations. http://www.vinelandresearch.com or 905-562-0320

GOVERNMENT SUPPORT

ONTARIO

The Business Development Branch – Ministry of Agriculture, Food and Rural Affairs is a one-stop shop for your investment location needs. It provides a wealth of information for new firms ready to commercialize innovation and start an Ontario-based project. The branch encourages growth in Ontario’s food processing sector, which involves working with companies that are already in business here to help them, for example, with finding information, resolving issues or finding export opportunities, and working with companies that are considering where to place their investment in North America. The branch supplies information on such factors as land and labour costs, labour availability, shipping distances, utility rates, taxes, potential suppliers for ingredients and packaging, regulations and much more. It can help identify companies for sale, food-grade building availability, buildings with rail spurs and other facilities available for purchase or lease and can set up meetings for you with senior government officials, researchers, other companies or other organizations. For support regarding an investment decision, please call 519-826-4447 or visit http://www.investinontario.com/food.

The Research and Innovation Branch – Ministry of Agriculture, Food and Rural Affairs spends more than $60 million yearly on research and innovation, with major initiatives including the OMAFRA/University of Guelph Agreement for research, laboratory services and veterinary clinical education;
selected research programs with other partners; an information exchange process for sharing the knowledge gained from ministry-funded research; and work with the Agricultural Research Institute of Ontario. The branch administers these programs. To learn more about the branch’s demand-driven research, please call 1-888-466-2372 ext. 64554 or visit http://www.omafra.gov.on.ca/english/research/.

The vision of the Ministry of Research and Innovation is to foster a culture of innovation and showcase Ontario, nationally and internationally, as a place where innovation is happening. For more information, call 1-866-446-5216 or visit http://www.ontario.ca/innovation.

Open for Business Ontario – Ministry of Economic Development and Trade is the Ontario government’s ambitious three-year initiative to create faster, smarter and more streamlined government-to-business services to make Ontario more attractive for business development while protecting the public interest. It also seeks to transform the Ontario government-to-business relationship. For more information, call 1-888-ONT-4-BIZ (1-888-668-4249) or visit http://www.investinontario.com (June 30, 2010).


4. CIA World Factbook estimates of GDP from Mexico, USA, and Canada. The Central Intelligence Agency. (March 12, 2010).


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Family shopping in Ontario store [page 5]:
Kellogg plant [page 12]:
Ferrero plant [page 12]:
Processing milk curd [pages 14 and 15]:
Naturally Norfolk’s freezer belt [page 17]:
Naturally Norfolk’s dryer unit [page 17]:
Institute of Food Processing Technology [page 19]:
Electrospun soy protein isolate fibres [page 20]:
Vineland Research and Innovation Centre [page 24]:
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Photo, Isabelle Lesschaeve [page 28]:
Photo, Alejandro Marangoni [page 28]:
Photo, Gregor Reid [page 29]:
Photo, Koushik Seetheraman [page 29]:
Photo, Vladimir Vuksan [page 30]:
Photo, Rickey Yada [page 30]:
Photo, Dérick Rousseau [page 32]:
Photo, Brian McBride [page 33]:
Photo, Steven Leeson and Julie Steele [page 34]:
Inside view of OMAFRA building [page 43]:

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