

FOOD & BEVERAGE ONTARIO

Ontario Innovation Facilities: Inventory and Assessment

June 28, 2016

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Growing Forward 2
A federal-provincial-territorial initiative



Canada 

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1 ACKNOWLEDGEMENTS

We are sincerely grateful to all of the food innovators for welcoming us, and spending the time to go through the details and the sometimes tough questions. We were overwhelmed with the hospitality and the openness of sharing. If this study measured only the amount of energy and enthusiasm these food leaders have, the results would be off the charts!

The completion of this study would not be possible without the generosity of the three selected benchmark players in the neighbouring provinces of Manitoba, Saskatchewan, and Alberta. These facilities are all a credit to their geographies and local government supporters. We appreciate their insight and assistance.

Thank you to Food and Beverage Ontario – and particularly Al Brezina, Director of Innovation – for the support in this study, including anxiousness for the results. This organization is serious about leading the food and beverage initiatives in Ontario, and embodies an undying support of local processors.

This project is funded through *Growing Forward 2*, a federal-provincial-territorial initiative that encourages innovation, competitiveness, market development and capacity building in Canada's agri-food and agri-products sector.

The study leaders have had significant research assistance and report writing assistance from the team at IFAB Engineering Partners LP. We continue to be impressed with the talent of our team.

Most importantly, this study has been made possible by the insight of the provincial government, who not only understand that the food and beverage sector is a benefit to the economy of Ontario, but also that this sector can lead the way to provide nourishment to its own residents, and, ultimately, to feed the world.

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2 EXECUTIVE SUMMARY

At the October 2013 Summit on Agri-Food, the assembled industry leaders supported the challenge to double the growth rate of the agri-food sector and to create 120,000 new jobs by 2020. In order to help realize this objective, Food and Beverage Ontario was commissioned by the Ontario Government to study how to improve business competitiveness through access to innovation resources. This report is the result.

The current model in Ontario is decentralized, with several options available to different types of entrepreneurs, depending on the type of product in development and their general location. Ontario's innovation centres offer excellent services for proof of concept on the culinary side; from recipe development and shelf life testing, to batch sizing and labelling, there is access to expertise and technology to help food entrepreneurs initiate a successful launch of product.

That said, the barriers to entry for food innovation entrepreneurs are not the ideas; there are many of those. In order to make a viable, safe, profitable product, entrepreneurs need mentorship, training, and overall assistance with any or all of:

- (a) Commercialization – including packaging, labelling, branding, and batch size;
- (b) Quality Assurance – shelf life testing, food safety;
- (c) Business Plan – an accurate calculation of cost of goods sold, product demand, scale up, and profit;
- (d) Facilities – hygienically designed facilities for the production of new food products; and
- (e) A go / no go plan for when the idea is not translatable into mass production.

This report reveals that the gaps to food innovation in Ontario are found in access to low cost leased production space for commercialized product runs, business training for entrepreneurs, and a central body to promote the development of food and to act as a liaison to assist entrepreneurs in the navigation of the myriad of services available.

The study resulted in the following recommendations that are detailed in Section 7 – Conclusions and Recommendations:

- Create a central body of knowledge;
- At least one facility in Ontario beyond University of Guelph should be federally registered;
- Add an additional innovation facility;
- Invest in business plans for entrepreneurs;
- Treat innovation as a business;
- Encourage more collaboration;
- Modify the funding equation;
- Add not-for-profit work for synergies; and
- Complete further study once a central body of knowledge is in place.



Ontario is moving in the right direction. A boost to innovation in the food industry will aid substantially in the achievement of objectives not only to maintain Ontario's lead position as a food producer, but also to expand to an even greater economic driver.

3 OBJECTIVE & METHODOLOGY

OBJECTIVE

Food and Beverage Ontario (FBO) has undertaken a project to establish an Ontario Food and Beverage Processing Industry Innovation Network, based on broad consultations with industry and government stakeholders. A key element of this project is to assess resources available in Ontario to support innovation in this sector.

As part of the initiative, a study was launched into the current infrastructure available to enable innovation for food processing. FBO conceived of a study to create an inventory of the current innovation facilities in Ontario and across Canada, including each facility's capabilities and capacities. IFAB Engineering Partners LP (IFAB) completed the study on behalf of FBO in October 2015 through to February 2016. IFAB is experienced in assessment, design, engineering, and construction of all types and sizes of food processing facilities, and has partnered with clients who have utilized the services of several innovation centres in Canada.

The objective of the project is to conduct an inventory of physical innovation facilities that are available in Ontario for Food and Beverage Processors, and to identify the capabilities of these facilities, their effectiveness, and any gaps or opportunities. Additionally, the intent of the project is to survey innovation facilities in other jurisdictions in Canada as a benchmark with which to measure Ontario's facilities, as reflected in physical capabilities, funding, and business models that are proven as successful.

There are a myriad of activities in the food industry, from learning institutions to associations to consulting. This report cannot possibly review all of the programs and groups in the food industry. The report writers acknowledge the excellent work in the study of food from universities, colleges, associations, and the Ontario Ministry of Agriculture, Food and Rural Affairs. Refer to Section 8 for a list of some of the groups investigated with respect to advancement of the food sector.

In order to understand what this report includes, it is equally important to discuss its limitations. This report is intended to study the innovation centres that exist in Ontario as compared with the selected benchmarks in the provinces of Manitoba, Saskatchewan, and Alberta. The report reveals potential gaps in the current framework of innovation in Ontario, and draws out logical recommendations based on the gaps. However, this report does not explore the feasibility or costs of each of the recommendations, nor is it intended to be a detailed action plan. Neither is it a list of specific equipment available at each of the facilities. This is an inventory of existing services available to Ontario entrepreneurs in the food and beverage processing sectors to aid with new products moving from concept to commercialization and beyond, thus promoting innovation in Ontario's marketplace.

DEFINING “ACCELERATOR” AND “INCUBATOR”

From the onset of the research, it became apparent that the words “accelerator” and “incubator” were being used differently within the food and beverage innovation groups, and even into the global forum. In order to minimize any confusion between the meanings of the words, a choice was made to eliminate these words altogether. Instead, these definitions have been utilized:

Proof of Concept Area: a place – ideally with equipment, infrastructure, and staff – that is made available to develop ideas in a defined time frame (which is short, usually less than 6 months), often for a fixed fee. These can come in the form of commercial kitchens, research and development areas, and sensory testing labs.

Leased Production Space: a place – ideally with infrastructure and staff – that is made available to new small businesses, usually at low rent and often on a month by month basis. Leased production spaces often are vacant spaces, with equipment provided by the user. In the case of food and beverage production, the leased production space must be a hygienically designed area that meets food safety regulations.

METHODOLOGY

In order to create a non-biased and scientific approach that can be replicated in the future, a series of questions was devised in order to ascertain each of the selected innovation centres in the areas of:

- (a) Capacity;
- (b) Sectors;
- (c) Utilization Rate;
- (d) Geography of Clients;
- (e) Successes; and
- (f) Areas for Future Improvement.

The surveyed innovation centres in Ontario were selected on these criteria:

- (a) Focus was on the innovation centres that receive public funding, particularly at the provincial level;
- (b) Focus was on the food and beverage manufacturing sector (vs agricultural innovation centres);
- (c) NSF-GFTC (formerly Guelph Food Technology Centre) was added due to its reputation for innovation in the food sector; and
- (d) We note that large food companies also have their own in-house innovation and research centres and methods for product development – such as Maple Leaf Foods’ ThinkFOOD! Centre, The President’s Choice ‘Recipe to Riches’ contest, and Sobeys Test Kitchen – which all aid in the quest for innovative food products; however, these were not included in the study.

There are several successful programs at local colleges and universities for both training and research. Focus for this report was on the selected innovation centres within those colleges and universities that are open to public access. There are several excellent programs for students in the food sector beyond the scope of this report.

Benchmarks in other provinces were selected on these criteria:

- (a) Focus on food and beverage sector (vs agricultural or pharmaceutical innovations); and
- (b) Project funding limited the selection to three direct comparators from those available.

The inventory analysis took place October 2015 to February 2016. In all cases, we were able to conduct in person interviews and visual inspections of the facilities. Section 5 of this report is the summary of each review. Section 6 is the overall comparison.

The data has been researched and organized in order to identify the following:

- (a) Capability by sector, technology, geography, and ability to produce a commercialized product;
- (b) Information on funding sources; and
- (c) Identification of how the facility is being used by food processors.

Following the FBO ITT review in February 2016, fact check and information accuracy was completed in March 2016 by each of the selected innovation facilities in Ontario. The report was reviewed by representatives from the Ontario Ministry of Food, Agriculture, and Rural Affairs in May 2016.

R E P O R T N O T E S

In this study and report, we note the following:

- (a) Reference to the “food industry” includes the entire food and beverage sector in the complete supply chain, as well as the branch services not directly associated with the production of food but with the goods and services focused on food (marketing, research, equipment, engineering, and consulting, for example).
- (b) All types of innovation facilities are referred to collectively as “innovation facilities”. A distinction is drawn in Section 6 to compare innovation facilities that have the ability to create commercialized (saleable) product, versus those that do not.
- (c) Any non-specific references to gender should be interpreted as gender neutral.

4 CLIMATE OF FOOD INNOVATION

INNOVATION

The word “innovation” can be heard in promotion of any economic industry, from the oil sands to tourism. When an entrepreneur finds a way to meet a demand of the growing population, or discovers a new niche market, then it follows that there is potentially greater chance for the product’s or service’s success. Innovation – with all of its many meanings and interpretations – is fundamentally about finding new products and services that have a viable market, ideally with a resulting profit.

With respect to the food industry both at home and globally, innovation is playing a key role to meet consumer needs. “Food is the new oil”, proclaimed Dan Borowec of the Ontario Agri-Food Venture Centre (OAFVC). It is, indeed, an exciting time to be part of the food industry.

Within the study, several types of innovation were identified as being explored, including:

- Products developed by and for the growing ethnic population, including capitalizing on the influx of new immigrants to Ontario for the variety of food products that all Ontarians can enjoy;
- Healthy products for the active, health conscious, and aging population;
- Development of technology, including types of packaging;
- Culinary Tourism – for people who travel for a food experience;
- Trends for eating habits (e.g. prepared meals) and diets; and
- Sourcing local products as a way to promote both local economic strength and environmental sustainability.

The success of innovation is dependent not only on the product, but also on a successful business plan. Great products can be abandoned if they cannot be commercialized, or if there is no market. The research shows that several types of training can assist with turning a food innovation concept into a reality, including:

- Food safety, hygiene, and HACCP;
- Process efficiencies with high speed and/or big batch equipment;
- Business plans;
- Ingredient sourcing; and
- Youth involvement – not only as cooks, but also the extended supply chain requirements for new food products, including marketing students (attractive labels to sell food), technical experts (move from conceptual design to reliable throughput), and business students (the business cases for new food products).

VALUE OF STUDY

Those of us in the industry can recall that in the economic downturn of 2008-09, several local manufacturers had difficulty overcoming the barriers of the dollar and the reduced amount of consumer spending. But food kept going.

The value in increasing local industrial food manufacturing goes well beyond the creation of jobs directly associated with food manufacturing. There are also potential benefits of:

- (a) The extended network of the entire supply chain, from primary food production to full distribution;
- (b) A growth of self-sufficiency to be able to feed the growing population from within, and to expand distribution to locations across North America and globally;
- (c) Elevating a standard of local sustainability with good environmental stewardship; and
- (d) Attraction of foreign investment both as a purchaser of products or direct investment into facilities.

One of the identified limiting factors to innovation is the highly competitive retail marketplace in Canada. The food industry is wrought with low margins, quick-to-market concepts, and a high level of pursuit of market share. As such, there is an inherent “race” for the competitive edge with innovation.

THE CRIFPT REPORT

No discussion of local food processing innovation is complete without reference to the report “Advancing Innovation in the Food Processing Industry: A Gap Analysis between Food Valley and Ontario”, as prepared by Luis Garcia, Craig Richardson Institute of Food Processing Technology, January 2013. This report was generated from the Food Industry Innovation Forum of November 2012.

The report documents the state of Ontario’s food innovation sector as compared to that in the Netherlands’ Food Valley, and provides a qualitative analysis of the gathered information. The report captures a snapshot of Ontario’s food industry in 2012, particularly the concern with an isolationist attitude of Ontario-based producers, leading to less collaboration and, consequently, less innovation. The conclusion is that innovation through collaboration is not practised as a key component of Ontario-based processors.

It should be noted that since this report, several new facilities have opened their doors in Ontario which enrich its innovation service offerings from those listed in the report.

5 INVENTORY OF INNOVATION CENTRES

ONTARIO

Canadian Food & Wine Innovation Centre (CFWI IC), Niagara College – Niagara-on-the-Lake

CFWI is a 14,000 square foot facility, currently in expansion, at Niagara College. The institute was borne out of a rebranding of the “Research and Innovation” branch of Niagara College, and is principally funded through NSERC. With respect to technology, there are four well-equipped food-science laboratories and teaching kitchens that can be used for product development and testing. Niagara College is home to Canada’s first teaching brewery and commercial teaching winery, both of which are also for use as research facilities. The programs host approximately 700 students in the various culinary programs.

When a client approaches CFWI IC for assistance, the projects are streamed into two main types:

- (a) technology project – product testing and recipe modification/formulation, for example, or
- (b) business project – supply chain and marketing, for example.

CFWI IC offers services such as process improvement, recipe development, sensory testing, food safety training, traceability training, HACCP plan development, and competition analysis. Part of their mandate is not to compete with local food production, but to support it by enabling more innovation in the sector. Projects have included beverages of several types, as well as value added products including salsas, and dressings. The future expansion will allow for new offerings with charcuterie products, bakery, and further beverage research.

CFWI IC has the capacity to complete 13-15 substantial projects per year, depending on the size and complexity. Both students and faculty are available to assist. Currently the facility is estimated at 80% utilized. CFWI IC is sought out well beyond local geography for expertise in applied research.

The goal of CFWI IC is to create an integrated solution for success, right up to the commercialization stage. CFWI IC itself is not able to assist with commercialized production runs other than with their own winery and brewery.

The challenges faced by CFWI IC are:

- (a) Funding. Currently CFWI IC is at the end of a large NSERC grant, and there is uncertainty of extension. Other options are being explored.
- (b) Co-Packers. Once a product has been through the process, clients often cannot afford the leap into their own industrial facility, and they need a proof of concept area facility or co-packer to ramp up production.

CFWI IC is proving to be quite successful at the proof of concept stage, and is helping clients realize their potential of success through any means available within the college expertise and through use of its referral networks.



Craig Richardson Institute of Food Processing Technology (CRIFPT), Conestoga College – Cambridge

CRIFPT opened its doors to its first classes in September 2011. The objectives of the facility are:

- (a) Training – develop a skilled workforce for food facilities, and
- (b) Applied Research.

The facility has very good equipment and separation of work areas. It was specifically designed as an industrial room, which is different from some of the other commercial kitchen spaces at innovation centres. The space includes: a batch baking line completed with proofer, oven, and spiral cooler; a bottling line complete with pasteurizer; a vegetable processing line including automated weigh scale packaging; and a laboratory that is also used as a classroom. The three production lines are housed in one room that also includes coolers, all within a space that is designed to be CFIA compliant, though not registered.

Funding was received by all levels of government to build the facility and acquire new equipment. Current research projects have been funded through different government programs and through private funding using a “fee for service” model. There are 6 members of staff, though not all full time. Where projects call in other experts, funding can be made available to relieve experts of teaching duties in order to make them available for the project.

CRIFPT has welcomed a few projects in their early years, including beverage, confectionery, vegetables, and packaging projects. The staff has the capability and desire to assist food processors with funding. As well, the CRIFPT staff is highly active in local programs promoting the food industry, most notably the South Western Ontario Food Innovation and Technology Collaborative (SOFIT). Luis Garcia, Chair of CRIFPT, is optimistic about this initiative: “We see ourselves becoming an important player in technology development and innovation as it relates to manufacturing, and as the leader of the collaborative.”

Despite the original needs assessment showing that industry desired this type of facility for both training and applied research, the utilization rate is lower than expected. The barriers to full utilization are identified as:

- (a) Lower than anticipated student enrollment at the onset. This has changed substantially in the last year, and continuing to grow.
- (b) The size of the room. Equipment is tight in the current space. There are plans to improve as new technologies are added this year.
- (c) Food innovators are required to hand over their projects to the staff and students at CRIFPT, and do not directly participate in the process. This limits several types of projects.
- (d) Currently there is no tie in to the college’s hospitality program. Both of these programs could benefit from the inter-relationship on the manufacturing of food. There are plans for this in the future.

CRIFPT is a state-of-the-art facility that has significant potential to aid in innovation and the food and beverage industry as a whole, particularly aimed at maintenance and problem solving of high performance industrial equipment.



Food Innovation & Research Studio (FIRSt), George Brown College – Toronto

FIRSt is part of the George Brown College Research Network and offers industry partners access to technical resources, state of the art facilities, and networking opportunities with the Greater Toronto Area food and beverage industry. FIRSt focuses on accelerating new food ideas from “concept to commercialization. It was established as a Technology Access Centre in 2012, building on food science and culinary research in operation since 2007.

The main facility is a 4000 square foot research lab with four main kitchen galleys, including a private kitchen for secret recipes. This is augmented by sensory evaluation testing areas, a 4000 square foot industry engagement and interaction area for consumer focus groups and sensory panels, and a 4000 square foot beverage research lab that focuses on product promotions such as beverage and food pairings, product launches, media and industry events. In addition, a large quantity bake lab and a large quantity culinary lab are available for scale up production work. There is also an industry showcase kitchen for industry events. Services centre on product development, ideation and recipe development, prototyping and testing, shelf life optimization and plant trial support, consumer insight and testing and training and workshops.

Specialized equipment includes a pressure retort, autoclave, kettles, metal detector, continuous band sealer, blast chiller, ice cream maker, specialized oven, UHT system, carbonator, filtration system. FIRSt currently employs 10 full-time and 2 part-time staff, with additional expertise and assistance from College instructors that can also be made available on a project by project basis.

Projects in the studio have included: recipe development, scale up, product development optimization, shelf life extension, consumer sensory testing, ingredients sourcing, packaging, nutritional analysis, labels, assistance with co-packers, and, ultimately, new product launch. Projects have centered on value added products, and include extensions into all sectors with the exception of proteins.

The utilization rate of FIRSt is regularly in the 80-90% range. FIRSt has the distinct advantage of being associated with the George Brown Centre for Hospitality and Culinary Arts, a renowned culinary school. FIRSt also consciously works social media and industry networking opportunities in order to gain exposure and to help firms access informal training and networking opportunities. Funding for FIRSt comes from several sources, most notably NSERC. Clients also pay for usage.

The challenges for FIRSt are self-identified as:

- (a) Keeping up with the growing demand in the GTA.
- (b) Ensuring clients can access other resources for successful product launches.
- (c) Supporting the growing integration of the GTA food cluster.

Overall, the FIRSt success story has been built on a strong reputation of culinary arts, with the addition of practical food science services that serve clients well.



Food Starter – Toronto

Officially opened in September 2015, Food Starter is the next phase of the original genesis pilot project Toronto Food Business Incubator (TFBI), as conceived by Michael Wolfson. TFBI helped several food entrepreneurs over 3 years with training and consulting for start-up, proving that there was a need. Food Starter was launched to continue to meet that need, and specifically with the goal to create local jobs. Its objective is also, as Executive Director Dana McCauley so aptly explains, “To help decipher the alphabet soup of the food industry.”

The not-for-profit facility hosts a Food Commercialization Program, which has a menu of training options and leased production space. There are 4 well equipped commercial kitchens for small scale up production, including a rotary oven. Additionally, there are 6 open bay spaces of varying sizes for short term rental to help food entrepreneurs go beyond the initial proof of concept, and sell their goods on the market.

An important feature of Food Starter is that it is a “hands on” facility for entrepreneurs. Food Starter’s goal is to create capability for self-sustainability, enabling food innovators to do it themselves.

All clients undergo a screening process to ensure that they have a feasible business plan. There are seminars and training for all levels of entrepreneurs. The reasonably priced 12 month business training has three steps:

- 1) Discovery – 13 weeks – includes accounting, food safety, branding, and positioning
- 2) Development – 13 weeks – includes quality assurance, safe allergen handling, product costing
- 3) Market Start Up – 26 weeks – includes floor plans, human resources, facility options

Food Starter markets itself with an emphasis on baked goods. Interestingly, none of the 9 first clients fall into those categories. The facility is currently working on beverages, confectionery, sauces, spice blends, secondary protein, and vegetables. The facility is provincially registered, and saleable product can be produced at any stage.

Funding is provided by the provincial and municipal government, *Growing Forward* 2, and by client usage. There are three years of funding available currently; however, the biggest challenge the facility faces is the amount of capital investment it takes to start up any food facility and to obtain good sector expertise. The current staff is comprised of two full-time (and well-experienced) experts.

Food Starter is off to a strong start, with early uptake and a high level of interest. Challenges include longer term funding, and a staff that is working more than a full time week in order to keep up with simultaneous business development and client assistance.



NSF-GFTC (formerly Guelph Food Technology Centre) – Guelph

NSF-GFTC is currently moving out of its long term home at the University of Guelph, and into an independent but affiliated building off campus. This private organization was selected to be part of this study given its long term reputation in the world of food processing training and innovation.

In February 2013, GFTC merged with NSF International. As of April 2016, NSF-GFTC is moving to its new 21,000 square foot facility in Guelph that will house 1 pilot plant and 2 laboratories.

NSF-GFTC focuses on both food safety training – with several options for courses on line or in person – and technical consulting services for food products. The centre is far-reaching, and each year provides audit, training, and consulting services to over 1500 businesses, with services to 26 countries and in 8 languages.

With respect to food innovation, NSF-GFTC has 20 years of history with research and development prototype projects that have spanned several food sectors, including many projects with the dairy industry in particular. The original GFTC included bulk dairy receiving, cheese making equipment, ice cream, large retorts, and pasteurization equipment.

Funding for the NSF-GFTC is through the private not-for-profit foundation and in client fees. The team at NSF-GFTC includes a staff of 8, including experts in food safety, product development, packaging, labelling, and training.

We look forward to learning more about the NSF-GFTC offerings in their new building.



Ontario Agri-Food Venture Centre (OAFVC) – Colborne

OAFVC celebrated its grand opening in May 2015. As a niche food processing facility, it offers:

- (a) Small batch processing;
- (b) Packaging and storage of foods before retail or wholesale distribution;
- (c) Second-source revenue development for farming operations; and
- (d) A stimulating environment for food-business entrepreneurs.

The facility assists in the development and scaling of new product recipes, including some co-packing services, before assisting clients in locating and contracting medium-to-large scale co-packers or independent production facilities.

The 15,000 square foot facility includes: a small food laboratory; raw food processing area for value-add activities such as dehydrating and flash freezing; a reconfigurable commercial kitchen for batch baking and grilling, complete with a kettle for retort or mixing; a packaging and labelling area, complete with conveyors and metal detector; and storage areas for refrigerated and frozen products. The facility is designed as an accelerator facility, with an expectation that it does not become a co-pack type of facility. The objective is to launch clients to other facilities. Business support services are offered in conjunction with strategic partners and services currently provided through Northumberland county Economic Development.

Currently there is only one full time employee with significant food operations expertise; support staff numbers vary based on client needs. Funding is primarily provided by all three levels of government, by individual client use, and by donation.

The well-equipped centre is founded on the mix of theory and practical. OAFVC is affiliated with local learning institutions Durham College and Loyalist College, and offers pre-apprenticeship programs in cooking and culinary.

Projects at OAFVC have included bakery, beverages, confectionery, and value added products. The staple, however, is fruits and vegetables. Currently there does not appear to be seasonality.

OAFVC is actively seeking clients to maximize the space utilization.

OAFVC is open to any opportunity, and has specific and measurable goals to create jobs, to train students, and to create business partnerships. The model of integration with the local colleges has initiated a positive synergy effect in the region, with great potential for the long term.



University of Guelph – Guelph

The food innovation capacity at the University of Guelph (U of G) is comprised of several interrelated endeavours:

- 1) *The Food Institute*, whose mission is “to be a world leading portal for food knowledge and expertise through industry extension and training to drive understanding, innovation and action on local and global food issues”;
- 2) *The Department of Food Science*, which includes not only the academic faculty, but also both the Guelph Food Innovation Centre and the Guelph Food Academy;
- 3) *The Canadian Research Institute for Food Safety (CRIFS)*, which aims “to bolster the Canadian agri-food sector through public health protection, enhancement of trade and increased awareness of food safety”, and
- 4) *The Meat Science Laboratory*, a federally registered facility for meat processing from abattoir to ready-to-eat commercial products, including a smokehouse, all used both for teaching and research and investigation on meat products by paying clients, and also as a leased space for meat processing.



U of G is home to the largest food science department in the country, and its 200 local food sector faculty promotes scientific and practical innovation in the agri-food sector for all ranges of users in every sector. Clients typically include small independent companies, large national food producers, agricultural boards, and even the Research Council of Canada. U of G is widely recognized for successes in applied research in the agri-food sector, including soy beans, Omega 3, and Yukon Gold potatoes.



In addition to the Meat Science Laboratory, the related innovation facilities are comprised of 4 laboratories, sensory testing facilities, and kitchens. The farm-to-fork offerings include specialized areas for live animal holding and testing (for milk, etc.). Plans are in process to renovate the pilot plant area previously occupied by the NSF-GFTC, with a goal of creating a commercial dairy lab. This pilot plant will complement the on-campus traditions of the cheese making course (started in 1893) and ice cream course (started in 1914). In total, roughly 76,000 square feet of the university grounds is dedicated to the multiple activities in agri-food innovation.



The university complements the direct food innovation processes with the College of Business and Economics (CBaSE), which offers programs in entrepreneurship and business planning.

Overall, U of G embodies a long term reputation for excellence in food research and application, with both facilities and access to food scientists, researchers, and students. Currently there are limits to the offerings of the facility, specifically with commercialization of food sector innovations beyond primary and secondary protein processing.

BENCHMARKS

Agrivalue Processing Business Incubator (APBI) and Food Processing Development Centre (FPDC) – Leduc, Alberta

FPDC was initiated by Alberta Agriculture and Forestry in 1984, with the APBI incubator side added in 2007. In 2012, the campus expanded to its current size of 65,000 square feet of pilot plant (proof of concept area) and 75,000 square feet of leased production space. The leased production space area is divided into 8 independent and separately metered units – 7 of which have refrigeration – plus storage, employee, and office areas. On the accelerator side there is also a commercial kitchen, a large laboratory, and sensory testing lab. The equipment available allows for full scale production of meats and proteins, as well as operations for bakery, grains, and virtually any type of food processing in the proof of concept area side.

The facility is federally registered, and all clients must comply with the HACCP procedures, which is a learning in and of itself. APBI/FPDC staff members agree that it is critical to maintain the federally registered status in order to access the markets beyond the provincial and international borders.

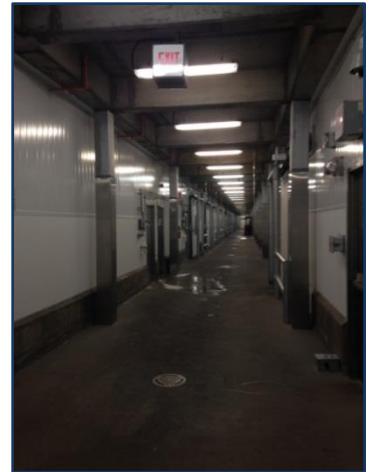
Funding for the programs are from multiple sources, including the Growing Forward Fund, the government of Alberta, and paying clients. The goal of the centre is not to be profitable, but rather to measure success based on usage and jobs created. APBI/FPDC management is currently in the process of building key performance indicators. Recent clients have created local industrial projects with hundreds of jobs. The world class facility offers services well beyond food production, including business programs, import/export laws, and even access to translation services and drivers' licences.

The APBI assists with several types of projects, from commercialization and throughput improvements, to packaging innovation, to space rental to allow for companies to manage surges in their own facilities. The facility houses food scientists, engineers, and food technologists who can assist on any type of food project. The 20 staff members include food scientists, operations experts, technicians, maintenance, and full time business development. Peer research is conducted with the University of Alberta.

The FDPC is regularly utilized, but is not at capacity. At the time of this report, the 8 proof of concept area suites were booked to be more than 90% occupied in the coming months, which is a trend that FPDC will strive to maintain. A business development manager has been hired to assist with marketing for the facility, and to draw clients in who might otherwise not know of what is offered. Clients come from around the world, many of whom utilize the facility as a gateway to the Canadian market.

Interestingly, geography does not seem to play a role in this facility as it does in Ontario. Clients travel from all parts of the province and from around the world. There is a synergy with the size of the facility itself; with everything all under one roof, there is an inherent efficiency of costs. One of the potential future plans is to consider adding leased production space in Southern Alberta.

The challenges that APBI/FPDC faces include both maintaining state-of-the-art equipment, which is a key attraction to many clients, and promoting innovation in the province by keeping both sides of the facility full of clients.



Food Development Centre (FDC) – Portage la Prairie, Manitoba

The original concept for the FDC was initiated in 1978 with a focus on farmers' market products. It was the first food development centre to be created in Canada. Over the years, the centre has expanded 8 times to its now current size of 60,000 square feet, including 4 suites for development, 3 leased production spaces, a formulation lab, and a sensory testing lab.

The offerings of the facility have also expanded to proof of concept, shelf life testing, and packaging. There are 26 full time members of staff at the centre, including 12 food scientists, 6 administration, a business development person manager and staff for the pilot plant.

Clients for the FDC have the greatest percentage within Manitoba, but also come from across Canada and internationally.

Technology at the facility includes industrial batch baking including mixer, proofer and pizza oven; filling, bottling and labelling; pasteurization; packaging systems. The facility is separated into several work areas in order to foster independent research, with common areas for storage and lab testing.

FDC is connected with academics and research with both St. Boniface Hospital and the University of Manitoba. The resulting triumvirate creates a synergy of much greater results with the Manitoba Agri-Health Research Network (MAHRN). For the past 7 years, MAHRN has perfected a model to assist with the cycle of bringing a food product to market: St. Boniface conducts trials for efficacy; the University of Manitoba conducts research; FDC acts as the commercialization arm. As an example of success, the team conducted research on flax seeds, where University of Manitoba research showed how much per day is required for healthy adults, FDC experimented with recipes, and St. Boniface conducted the trials. This example is worthy of further study for potential application in Ontario.

FDC operates with specific metrics, including how many products are commercialized, the total number of clients, facility utilization rate, and jobs created. The federally registered facility is currently on target at 60% capacity, with added clients expected for the high season of January through March.

Funding for FDC is from the provincial government and through client usage. One of the drawbacks of the current system is that funding is provided annually only; despite the recurrence of funding, there is a difficulty with managing a facility and keeping staff with only an annual commitment.



Saskatchewan Food Industry Development Centre Inc. (Food Centre) – Saskatoon, Saskatchewan

The Food Centre was initiated in 1998 by the Saskatchewan Government, with an objective to help the Saskatchewan Food Processors to expand and drive innovation in the agri-food sector, as well as reduced risk in food products. The facility publishes its currently operational functions with goals to:

- (a) Strengthen and support the agri-food sector in commercialization and incubation of products derived from agricultural products;
- (b) Bridge the gap between technology development and commercialization;
- (c) Support the expansion of the food business to access new markets;
- (d) Provide collective resources to be used as a driver for commercializing new agricultural products for both food and non-food usage;
- (e) Provide management and technical services support;
- (f) Provide diversity in manufacturing through technical training and technology transfer and skills development; and
- (g) Strengthen and support commercialization of R&D work being undertaken by industry.

The 35,000 square foot facility is federally registered, thus allowing the commercialized products to be shipped beyond the provincial borders. Services include product development, interim processing, sensory evaluation shelf life testing, food safety training, and assistance with all elements of the supply chain. The facility includes a pilot plant, extrusion facility, product development kitchen, and a laboratory. There is a wide variety of equipment on site to help with any stage of processing in any sector of food other than animal food. There are currently no leased production space facilities; however, the future investment is poised for 3 leased production space suites to complement the existing offerings.

Technology includes an extrusion facility, product development kitchen, laboratory, and pilot plant facility with meat processing equipment. Relative to the size of the facility, there is an abundance of options for equipment in storage and ready for usage in any application. Utilization of the facility is based primarily on funding cycles, with more than full capacity for six months of the year, and less than 50% utilization during the proposal-writing stage.

Funding continues through the Saskatchewan Ministry of Agriculture and from client usage. It is a not-for-profit operation. The Food Centre participates actively in the Agri-Food Innovation Cluster, which also includes the University of Saskatchewan and POS Bio-Sciences.

The enthusiastic and talented team of 20 scientists, technical experts, and administrative staff offer dedicated support to any food initiative, and are truly passionate about making the local entrepreneurs successful.



Beyond the areas of focus in Ontario and the selected benchmark comparisons, there are several innovation centres in Canada and around the world that are worth noting. In no way is this intended as a comprehensive list, but only as a reference point to some of the other regions interested in the promotion of food innovation.

OTHERS IN CANADA

Food Innovation Centre – Chilliwack, BC

This facility was initiated by the BC government to provide food safety support, and to assist with access to commercialization and technology solutions. It appears to have been in operation for a year before shutting down. Further study is recommended in order to ascertain the root cause of the closure.

FOODTECH Canada – Charlottetown, PEI

FOODTECH has created an excellent website in their efforts to link food processors and promote the technology of food. FOODTECH looks for opportunities for the Canadian food producers to have more integration and unification, and promotes modern technology and manufacturing practices. <http://www.foodtechcanada.ca/>

Guelph Research and Development Centre – Guelph, ON

The Guelph Research and Development Centre is one of Agriculture and Agri-Food Canada's network of 20 research centers. It supports all aspects of food production, from the field to the fork. As part of the overall promotion of a sustainable and profitable agri-food sector in Canada, much of the Centre's work focuses on exploring innovation for the potential for conventional foods to offer nutritional and other therapeutic benefit. <http://www.agr.gc.ca/eng/science-and-innovation/research-centres/ontario/guelph-research-and-development-centre/?id=1180620168432>

The Ottawa Incubator Kitchen – Ottawa, ON

The Ottawa Incubator Kitchen is a not-for-profit organization that strives to help local business thrive and entrepreneurs bring their passion to the community. It provides 24/7 access to a well-equipped 15,000 square foot commercial kitchen, and assists with aspects as diverse as ingredient sourcing, recipe scaling, packaging, and funding assistance. *At the time of this report, the facility is in start-up; more information will become available.* <http://ottawakitchen.ca/>

Saint-Hyacinthe Research and Development Centre – Saint-Hyacinthe, QC

The Saint-Hyacinthe Research and Development Centre is one of Agriculture and Agri-Food Canada's network of 20 research centres. The Centre focuses on conducting research and developing methods to preserve food and maintain its quality, and to process food safely and efficiently. Research is also conducted on food ingredients having health and other benefits beyond basic nutritional values. Food safety is also a major area of research. <http://www.agr.gc.ca/eng/science-and-innovation/research-centres/quebec/saint-hyacinthe-research-and-development-centre/?id=1180639333520>

INTERNATIONAL

Entrepreneur Space – New York, USA

The goal of Entrepreneur Space is to educate clients so they will outgrow the facility and become a viable business on their own production site. Starting in 2010, the facility opened a full time incubation space with a focus on bakery products. <http://www.entrepreneurspace-qedc.com/EntrepreneurSpace/aboutus/>

Food Valley – Wageningen, Netherlands

Established in 2004, Food Valley is a world recognized food cluster of business and research organizations intended to drive innovation in the Dutch agri-food sector. www.foodvalley.nl

Nebraska Innovation Campus (NIC) Food Innovation Center – Lincoln, Nebraska, USA

The Nebraska Innovation Campus' Food Innovation Center is a newly-constructed centre offering leased space to outside organizations, as well as mutually beneficial partnerships between these private-sector organizations and the university. The centre encompasses a 178,000 square foot complex designed specifically to encourage these public/private partnerships. It features wet/dry lab research space, food grade/non-food grade pilot plant space, a state-of-the-art distance education classroom and office space. <http://innovate.unl.edu/food-innovation-center>

New Zealand Food Innovation Network (NZFIN) – Auckland and area, New Zealand

The New Zealand Food Innovation Network is comprised of five facilities spread across the country. The facilities have differing capabilities. As a whole, the network includes both business support expertise (funding, business planning, etc.) and production facilities. The production facilities include one pilot plant and two commercial scale facilities. One of the facilities – FOODBOWL – was designed as a facility where companies can produce commercial runs of new products for trial marketing and hence capitalize on both domestic and export opportunities. <http://foodinnovationnetwork.co.nz>

Northwest Ohio Cooperative Kitchen (NOCK) – Bowling Green, Ohio, USA

As part of the Centre for Innovative Food Technology, NOCK was founded to assist new and growing businesses by providing access to a commercially licensed kitchen, networking and technical assistance. Focus is in product lines of baking, canning, dry mixing, sauces, and salsas, but no meat. This is a FDA licensed facility. <http://ciftinnovation.org/small-news-list/57-northwest-ohio-cooperative-kitchen>

Teagasc Food Research Centres – Dublin and Co. Cork, Ireland

Teagasc – the Agriculture and Food Development Authority – is the national body providing integrated research, advisory and training services to the agriculture and food industry and rural communities. It was established in September 1988 under the *Agriculture (Research, Training and Advice) Act, 1988*. <http://www.teagasc.ie>

6 SUMMARY OF KEY FINDINGS

SECTORS

Overall, the various sectors of food processing are well served within their natural boundary areas. Great examples of this are Niagara College focus on fruits and beverages, and OAFVC's focus on local agriculture, and FIRSt concentration on recipe development, notably on ethnic foods.

Chart 1, below, provides a summary of sector capabilities.

Chart 1: Summary of Food Sector Capabilities

	Ontario							Western Canada		
	CFWII	CRIFPT	Food Starter	FIRSt	NSF-GFTC	OAFVC	U of G	FDC (MB)	APBI/FPDC (AB)	Food Centre (SK)
Type of Facility	institute	institute	standalone	institute	standalone	standalone	institute	standalone	standalone	standalone
Sectors										
Animal Food			◊	✓			✓		✓	
Bakery & Snack Food	✓	◊	✓	✓		✓	✓	✓	✓	✓
Beverage	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sugar & Confectionery		✓	✓	✓		✓	✓	✓	✓	✓
Dairy			*	*	✓	*	✓	✓	✓	✓
Fruits & Vegetables	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Grain & Oilseed Milling				**		◊	✓	✓	✓	✓
Packaging	◊	✓	◊	◊	◊	◊	✓	✓	✓	✓
Protein (primary)							✓	✓	✓	✓
Protein (secondary)	◊		✓		✓	◊	✓	✓	✓	✓
Spices & Powders			✓			◊	✓	✓	✓	✓
Value Added Products	✓		✓	✓	✓	✓	✓	✓	✓	✓
Notes:										
◊ = capable, but no clients			*Dairy capabilities in Leased Production Spaces, no bulk dairy receiving	*butter products; no bulk dairy receiving ** quinoa		*Dairy capabilities in Leased Production Spaces, no bulk dairy receiving				
✓ = completed projects										

Note on Chart 1: This is aimed specifically at the food sectors available in each facility. The authors acknowledge there are additional aspects offered by each innovation centre – including training & education, business planning, labelling, product development and storage, to name a few. Please refer to other sections of this report for details.

Notably absent is the sector of primary proteins, offered only at the University of Guelph. At this stage of study it is undetermined as to whether Ontario food innovators require additional access to meat processing facilities.

Chart 1 also identifies the type of facility as either linked to a learning institution, or a standalone facility. There is a difference between the two, each with its own advantage. Colleges and universities have access to multiple ranges of knowledge and labour in both the faculty and the student population; this can be quite a benefit, particularly with respect to scientific testing and experimentation. Additionally, the learning institutions have the ability to leverage existing multi-purposed infrastructure. In standalone facilities, the immediate benefit is the ability to commercialize product without the restriction of being situated on a college or university campus, and access to the proof of concept area and leased production space suites becomes much more private for those entrepreneurs who wish to operate independently.

Interestingly, the benchmark comparisons merge the two concepts by co-mingling food scientists in a commercialized facility, all in partnership with local educational facilities, thus realizing the benefits of both aspects.

TECHNOLOGY

There is a constant challenge to maintain technology in any innovation centre. Each of the centres has purchased the most essential equipment due to the limited funding. It is difficult to anticipate when any particular entrepreneur may need, and the experts need to be innovative with the equipment itself. Technology is not necessarily a limiting factor for any of the centres that were interviewed, though all endorsed the concept of sharing access to equipment across the multiple innovation centres in order to better accommodate clients.

Tim Hore, Chief Operating Officer of FDC in Manitoba, reminded us that “as soon as you buy a piece of equipment, it is obsolete.” The goal, then, is never to be ahead of the market, but to utilize all equipment available in the best way possible. Food scientists have a knack of being able to construct a suitable short term processing line out of anything available – for example, at FDC they used a meat grinder as a pasta extruder.

A list of equipment can be developed and maintained by each facility, and even transferred to a master list, such as the one in place by FOODTECH. However, the caution is that there is always interpretation of the level of maintenance of equipment and its multiple uses subject to need and creativity.

Current equipment available in proof of concept area facilities is adequate for small batch production.

Potential gaps include:

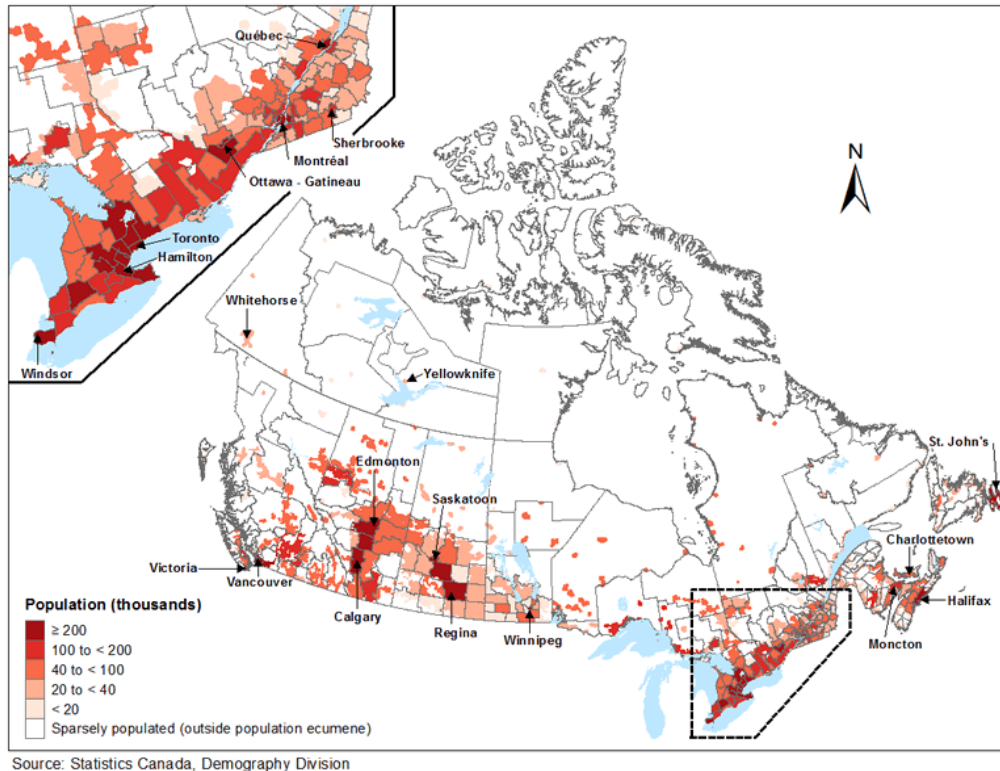
- (a) Continuous line baking and frying
- (b) Automated bottling (available at CRIFPT, but not for commercialized product)
- (c) Bulk dairy (available at U of G in the former NSF-GFTC area; with proposed renovations in store)

Leased production space spaces require hygienically designed space available for food production, ideally to be made for sale and not just for experimentation. Often entrepreneurs are expected to provide their own equipment – purchased, leased, or borrowed – for use in the space. Continued attention to government funding available to help lease equipment is also of benefit.

GEOGRAPHY AND POPULATION DISTRIBUTION

With application of a basic premise that there are a quantifiable number of entrepreneurs in any given population, a comparison of population distribution against available innovation centres is in order. Figure 1 shows the current population distribution in Ontario.

Figure 1: Population Distribution – Canada, and Southern Ontario



Source: Statistics Canada, Demography Division

All of the innovation centres in Ontario are focused in the south. This matches the current population distribution. That said, as Northern Ontario populations increase, it will be worth investigating the feasibility of a northern Ontario food innovation centre.

Southern Ontario is the focus of innovation, with the population density scattered along 401 and QEW corridors on the shores of Lake Erie and Lake Ontario. In order to ensure adequate access to innovation centres, the focus should be in this area.

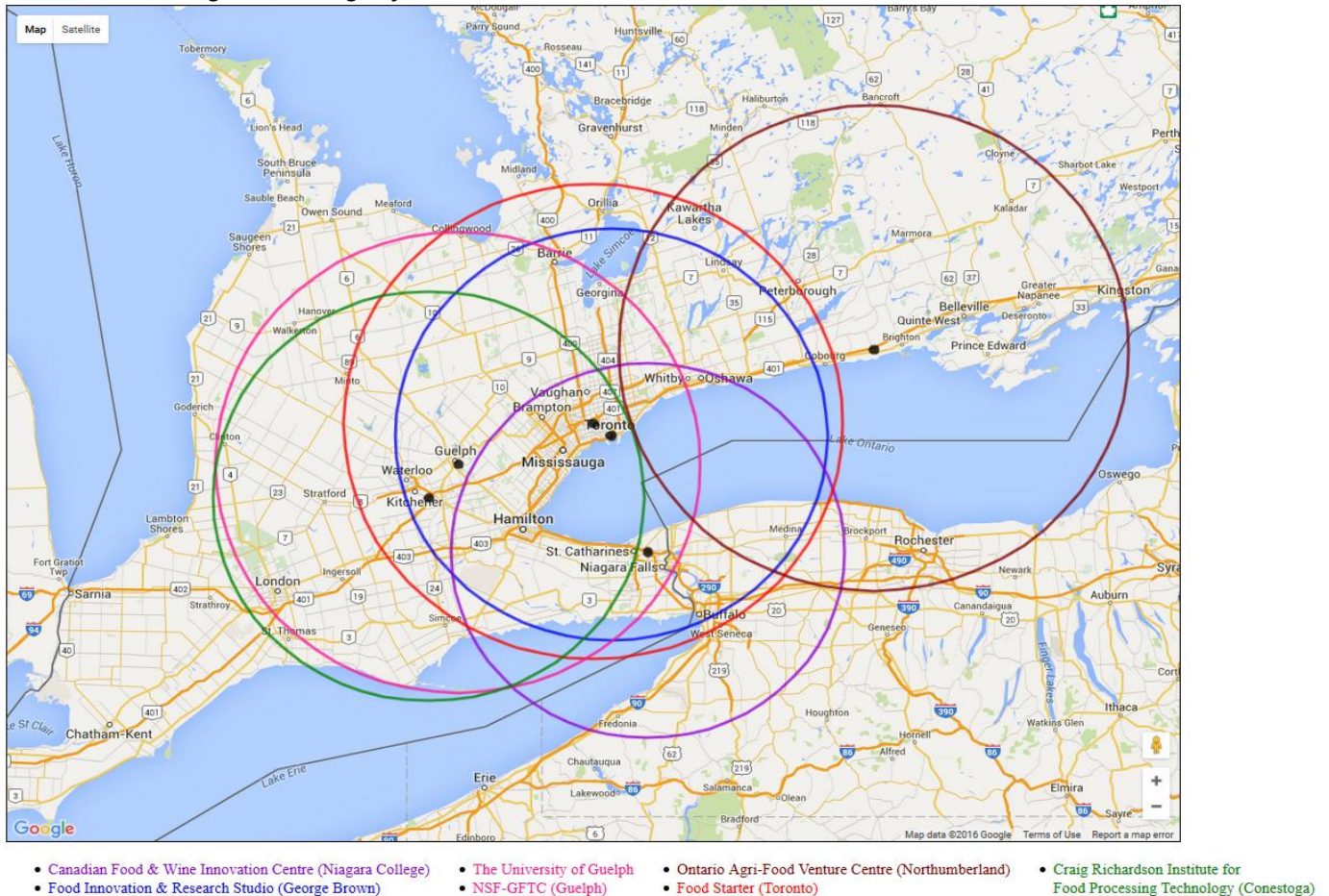
In the Southern Ontario existing innovation centres, repeatedly we heard the same story: clients for short term efforts (such as shelf life testing) will participate from any range of geography, including outside Canada. However, for longer term use of proof of concept area or leased production space in Southern Ontario, each of the centres reported that the significant majority of clients are drawn from within a maximum 1.5 hour travel distance from the facility. Evidence points to some clients who were unwilling to travel even from the east side of the GTA to the west.

This translates into a geographical issue unique to Southern Ontario. Importantly, the travel distance differs significantly from the models of Western Canada, where clients travel much greater distances (3-4 hours is the norm).

Does the perceived acceptable travel create a gap in Ontario?

In order to illustrate the range of travel, Figure 2 was created to depict the relative circle of travel to all innovation centres, regardless of sector proficiency. The result is centered between London on the west and Kingston on the east, with very little range to the north beyond Barrie or Collingwood.

Figure 2: Range of Travel to Ontario's Innovation Centres



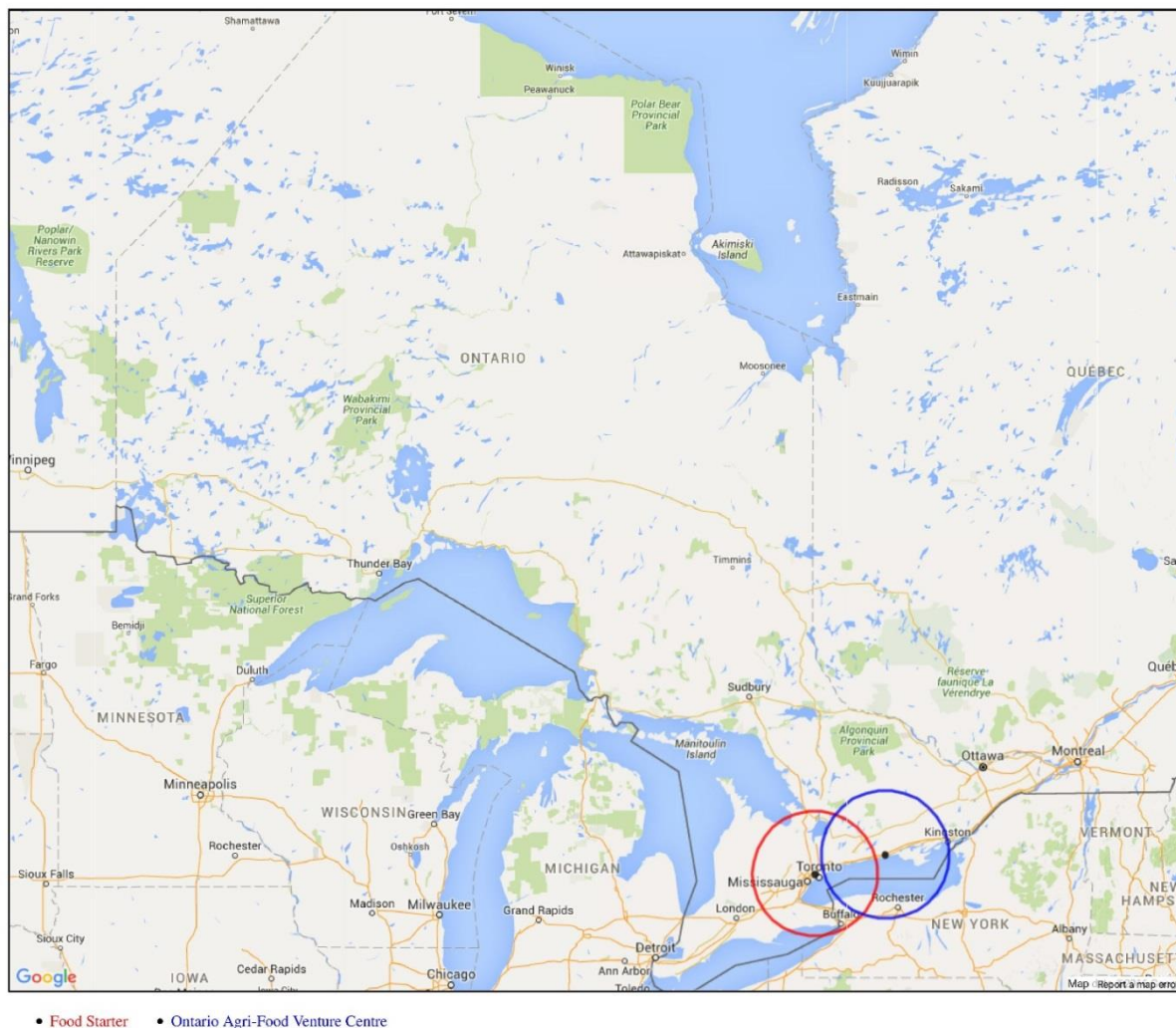
Note, for Figure 2, the radius of travel is for 1.5 hours of driving in September starting at 6:00 a.m. Range is subject, of course, to driving and weather conditions, and provided as a relative point of reference only. This map reflects all sectors and all ranges of capability; we note that for particular expertise, innovators may be required to travel significantly further than the ranges indicated. We also note that cross-water transportation is not considered viable.

What is important about this illustration in Figure 2 is that while there is general coverage in Southern Ontario, each of the centres is sector specific. On the plus side, there is general access. On the down side, the entrepreneur in a particular food or beverage sector must be fortunate enough to live or find lodging within the radius of the travel distance. Further study is required to understand where the potential users are located who cannot get access to services.

Even more importantly, the geography issue becomes more telling with respect to innovation centres able to produce commercial products. There are two independent provincially-sponsored facilities that have provincial registration, as well as two learning institutes that have specialized licences for particular

products. The travel range of service for the two independent innovation facilities with commercialization capability is depicted in Figure 3, below.

Figure 3: Provincially-Sponsored Centres with Commercialization



The range of innovation centres with commercial space is sparse relative to the population base. Yes, entrepreneurs can find other ways to commercialize product: private co-packers have developed hygienically designed spaces for rent in several regions of the province, and there are private companies that promote research and development for their brands.

The point in relation to geography and population distribution is that the model is currently a stark comparison to Manitoba, Saskatchewan, and Alberta. The choice of what model to follow is still in question.

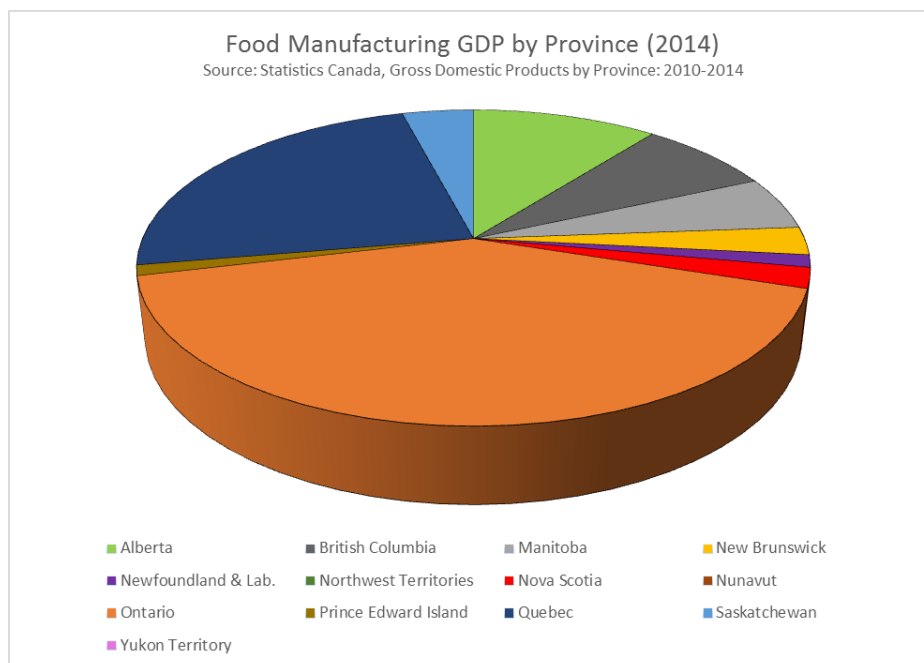
The amount of commercialized space available is discussed further below.

COMMERCIALIZATION

There is one federally registered facility in Ontario: The University of Guelph has a federally registered meat processing facility, and can process meat products from live to ready-to-eat. No other sector is represented with federal registration, and no other commercial products produced at innovation centres can be shipped outside of Ontario.

Ontario produces the large majority of Canada's food products. The 2014 GDP by Province shows Ontario in production of 41.26% of total food manufacturing, followed by Quebec at 23.58%, and Alberta at 10.63%, all as illustrated in Chart 2, below.

Chart 2: Food Manufacturing GDP by Province (2014)



Source data: Stats Canada 2014 GDP By Province for industry code 311 (Food Manufacturing):
<https://www.ic.gc.ca/app/scr/sbms/sbb/cis/gdp.html?code=311&lang=eng>

However, with respect to innovation, when we compare the Ontario facilities that can produce commercialized product to the benchmarks in this study, there is an immediately visible difference in the availability of both space and expert assistance, as illustrated in Chart 3.

Chart 3: Comparison of Provincially-Sponsored Facilities and Expertise

Province	Population*	Food Industry GDP** (in Billions)	Government sponsored proof of concept area and leased production space centres for commercialized products	Experts Employed
Alberta	4,196,500	\$ 2.399	1 – 140,000 square feet	23
Saskatchewan	1,133,600	\$ 0.924	1 – 35,000 square feet	20
Manitoba	1,293,400	\$ 1.232	1 – 60,000 square feet	26
Ontario	13,792,100	\$ 9.315	2 – total of <35,000 square feet Plus U of Guelph***	13

*Source population data from Stats Canada: <http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/demo02a-eng.htm>

**Source revenue data from Stats Canada, Gross Domestic Products by Province 2010-2014.

***Total volume and experts for U of G not included, given the multiple uses of the 76,000 square feet. A potential of several hundred faculty and students could be included as participating in the expertise; there are PhD candidates who work in the innovation areas, but no full time employees dedicated solely to the business of innovation.

The lack of federally registered options prohibits Ontarians from shipping food products across any provincial boundaries. Not only is the absence of a federally registered facility a limitation to start-up companies, but also – and perhaps more importantly – the inability to ship new saleable product across provincial borders can prevent a company progressing from a medium sized company to a large company. The innovation facilities of Alberta, Saskatchewan, Manitoba, and even New Zealand’s Food Innovation Network, all provide leased production space in order to assist companies take the next step of growth. In Western Canada we have seen several examples of food companies at capacity in current facilities use the innovation centres to make a significant step function change in their offerings, and allow for profit to be made on the new products while work is done to expand the existing production facility.

There is a barrier to progress here. The majority of innovation centres can conduct experiments and prove concepts; however, for any actual sales, the production must be moved elsewhere. The traditional approach to postsecondary education may have inherent barriers for educational institutions to produce commercialized product; however, Niagara College has overcome this barrier with its Learning Enterprise model, applicable in this case to wine, cider, and beer, and the University of Guelph has managed through the same traditional barrier with meat products.

Figure 4 illustrates the typical step changes for a growth company, which can occur quickly or over a long period of time. Within the provincially-sponsored innovation centres, Ontario is focused on the first hurdle: proof of concept.

Figure 4: Hurdles in Business Growth



It must be noted that of course the private sector's large food organizations, producers, and grocery chains have research and development programs, including use of space at the innovation centres listed.

Within government-sponsored innovation centres, Ontario is currently managing innovation well with recipe development, shelf life testing, labelling, sensory testing, and overall proof of concept. However, when the innovative food product is ready to be made into a saleable product, entrepreneurs must find their own production facility, or seek out private co-pack facilities. Food Starter and OAVFC have leased production space available, which is a helpful start. There is a gap between leased production space and the population of Ontario with its relative GDP in food. This gap exists not only for start-up companies, but also for small business owners who need an area for experimentation or to run new product lines to meet a new demand in order to overcome a growth hurdle.

Wherever it would be possible to modify existing facilities to allow for commercialization and federal registration, this would be a benefit. Any additional facility contemplated in Ontario is recommended to have leased production space for commercial products.

BUSINESS SAVVY

In every interview we heard a key concept, captured succinctly by Dr. Shannon Hood-Niefer at Food Centre: "Entrepreneurs are passionate about the product, but not the business."

Business ability is critical to the success of future entrepreneurs. In Ontario, the goal to produce 120,000 jobs will be difficult if the jobs are all small companies in a wavering start up. Added clarity with respect to training in the business of food will substantially increase the probability of success. Experts mentioned several anecdotal references to food innovators who did not understand how to calculate the cost of goods sold, and thus were not able to price products in order to make a sustainable profit.

In parallel with this study on innovation, a corresponding FBO report is being conducted for food industry education and awareness. The two are inextricably linked: Ontario needs both physical spaces and workers for an expanding food industry.

Refer also to Appendix A for a recent article from the Vancouver Sun on the topic of the business of craft brewing.

7 CONCLUSIONS AND RECOMMENDATIONS

During the course of the study and evaluation, the following gaps and corresponding recommendations were revealed. All of these recommendations play a large role in strengthening innovation of food and beverage manufacturing in Ontario, with the goal of new products for local consumption and export, direct and indirect jobs, and additional revenue across all of the supply chain and industries related to food production and distribution. Prioritization and timing of recommendations – including anticipated return on investment – need to be determined.

1) *Central Body of Knowledge*

Navigation of the myriad of services can be tricky even for the experts, not to speak of challenges faced by novices. The development of a synthesis of resources available is highly recommended in order to engage the population of Ontario to help realize the vision of job creation within the food and beverage sector. Food expertise is available not only in the actual production of food, but also in all of the related supply chain, from marketing to labelling to accounting.

The longstanding success of established innovation centres can be partially attributed to business development and community liaison – it's not just as simple as having the proof of concept area and leased production spaces exist, but more importantly that there is sufficient marketing and avenues of communication to the food innovators that there are services available to help them.

It is recommended that a central body become the “one stop shop” in order to attract new product development to Ontario, and to assist innovators to move from concept to commercialization. Further research may be required for a more precise action plan; however, this initial research points to a requirement for a central website, central phone number (such as 1-800-ONT-FOOD), and promotion that the services exist without having to contact each one separately. This central body is an efficient and relatively low cost investment which can immediately provide more straightforward access to innovation for entrepreneurs, as well as aid in further study to understand the gaps.

2) *Federally Registered Operation*

There is a gap of a federally registered processing facility available as a leased production space. At this point, with the exception of meat products at the University of Guelph, none of the products developed at innovation centres can be exported beyond Ontario. Currently, Ontario has either not identified or not pursued the need for federal registration. With the adoption of recommendation #1, above, the requests for a federal level facility can be monitored through a central agency. We do not necessarily recommend jumping into a federal level of processing without understanding the extent of the gap.

This solution may include expansion of a currently operating innovation centre, partnership with private co-packer(s), and/or a new facility.

3) *Additional Facility*

The population of Ontario, with its relatively proportionate number of entrepreneurs, can support another hub for innovation, particularly for commercialized product. Several sectors and regions of Southern Ontario are adequately served to a point. However, there is a shortage of leased production space in

Ontario where innovators can rent a suitable area in order to commercialize their products and build a start-up plan. The innovation centres in this analysis reported that food entrepreneurs have difficulty finding co-packers and/or suitable food production space to conduct further study. The timing, feasibility, and precise location of another facility – or possibly the repurposing of an existing facility – are the subject of further research.

4) *Business Plans for Entrepreneurs*

The number one aspect that well-established innovation centres noted as a hindrance to entrepreneurial success is an adequate business plan. The barriers to entry for the new innovator are being tackled with respect to laboratories, quality testing, shelf life, batch sizing, and even packaging. The new products can be developed and tested. However, the minimum entry requirement for a food innovator is a realistic understanding and feasible business plan beyond making their product in their own kitchen. This includes adequate ingredient sourcing, meeting regulations for labels and quality, SOPs, HACCP, product distribution, and an overall business plan that adequately calculates the feasibility of the overall endeavor. Those who provide the service of business planning have and will continue to find a greater level of success. Local universities and colleges are well poised to add business planning to their offerings, yet not all are incorporating this fundamental. Those in the industry understand that the level of hygienic systems and facility design is a cost that is required to be overcome in order to be successful.

This concept is so important that we recommend that clients are screened at the first step to any entry to prove they have a business plan. There is little sense in creating a perfect product that will have no market.

5) *Innovation is a Business*

The most successful innovation operations run their facilities as a business, with concrete objectives, metrics, and active business development. The solutions for entrepreneurial food processing with respect to innovation equals both company profitability and long term jobs in Ontario, not just interesting ideas and a “feel good” exercise. Metrics of success – which can include helping entrepreneurs to understand when their ideas will not succeed – is an essential part of measuring the result of innovation. This is a lesson learned by several of the longer term facilities, and one recommended to be adopted by all, as early as possible.

In short, the business of innovation can be actively developed. We recommend a full time role of business development for food innovation in order to market the available services, find new clients, and locate the great innovation ideas that are lurking in our local kitchens.

6) *Collaboration*

The various centres throughout Ontario largely operate independently. Since each centre has different funding and measures of success, each attempts to create its own clientele, and each works on its own proof of existence. Overall – and with some exceptions – food innovation is disjointed.

Cooperation for overall industry-wide success will aid in the growth of the entire system. FIRSt and Food Starter have initiated such a partnership for collaboration. OAFVC is working with local Durham College and Loyalist College for integrated learning. CRIFPT and FIRSt do share projects, and CRIFPT provides training services for equipment needs to Food Starter clients. From our benchmarks, the model from Manitoba provides Ontario with an example of how a food product can move from one centre to the next in order to gain access to the multiple levels of expertise.

We encourage a method by which cooperation for overall success becomes more rewarded and recognized, including sharing of best practices and deferring a client to another facility who can better serve needs. This may include priority funding for innovation centres who work together versus those who operate independently. We recommend an overall plan for Ontario's success rather than each centre working to prove itself in isolation.

7) *The Funding Equation*

The large majority of innovation centres, both in Ontario and beyond, reported that short term funding is one of the most significant hurdles in the operations of their facilities. Not only does it become challenging to make long term versus short term investments in equipment to meet client needs and continue with momentum, but more importantly it is difficult to sustain a high performance staff of experts when there is a fear of funding cuts. In all cases, each of the facilities reported a fear of losing their trained staff to more stable work. It is a challenge to understand how the funding equation can be altered such that the experts have a level of job security and recognition in order to keep them from being poached by the private sector.

Several members of the FBO ITT have indicated that this item is critical. Time spent working on funding and guaranteeing cash flow is time away from helping entrepreneurs with innovation. There is also a question of the inherent competition for limited funding that has the potential to result in cannibalization of each other's efforts.

We recommend that this be studied further, and, as identified in #6 above, the overall plan for Ontario include how the innovation business operates as a whole versus creating competition.

8) *Not-for-Profit Work*

There is an opportunity to put the underutilized equipment to work in not-for-profit endeavors. Examples of this include CRIFPT's innovation to package cereal for local breakfast programs, and the OAVFC's kitchen usage by local church groups. This type of synergy is encouraged. It keeps trained individuals working, and assets utilized for practical application.

9) *Further Study*

Further study is recommended with respect to feasibility and location of potential leased production space sites, as well as the sectors of investment based on the needs of potential clients. Research can be conducted through compilation of data in a central liaison, as identified in Item #1.

Research is required to determine the level to which private industry research and development is providing for innovation, as an option to entrepreneurs.

As well, further study is recommended on the private co-packing arrangements suitable for food, specifically to determine if there is sufficient space already available to meet the current and future demand.

8 GLOSSARY AND ACRONYMS

GLOSSARY OF TERMS USED

Since there are different interpretations of meanings, we have devised this simple list of common terminology that is used in the survey with respect to physical spaces commonly used for innovation.

Proof of Concept Area: a place – ideally with equipment, infrastructure, and staff – that is made available to develop ideas in a defined time frame (which is short, usually less than 6 months), often for a fixed fee.

Leased Production Space: a place – ideally with infrastructure and staff – that is made available to new small businesses, usually at low rent, and often on a month by month basis. Leased production spaces often are vacant spaces, with equipment provided by the user.

Innovation: the process of translating an idea into a replicable good or service that creates value, or for which customers will pay.

Pilot Plant: a small industrial system which is operated to generate information about the behaviour of the system for use in design of a larger system. Like Proof of concept area Facilities, these are usually short term and often for a fee.

Laboratory: a testing facility to measure qualitative and quantitative results of innovation products.

Sectors: For the purposes of this inventory, the sectors have been divided as follows:

- ♦ Animal Food
- ♦ Bakery & Snack Food (use of ovens and/or fryers to transform primary products into a baked or fried product)
- ♦ Beverage
- ♦ Sugar & Confectionery
- ♦ Dairy (both primary and secondary)
- ♦ Fruit & Vegetable
- ♦ Grain & Oilseed Milling (including breakfast cereals)
- ♦ Protein – Primary Processing (includes methods of slaughter, primal cuts, and use of by-products)
- ♦ Protein – Secondary Processing (transformation of primary processed proteins)
- ♦ Spices and Powders (the harvesting and processing of spices, herbs, and powders, such as whey powder)
- ♦ Value Added Products (including combinations of any other primary sector to create a specialized recipe; examples include soups, sauces, jams, jellies, dressings, and infused oils)

A C R O N Y M S

Acronym	Organization Name	Website	Headquarters	Information
AAC	Agricultural Adaptation Council	www.adaptcouncil.org/	Guelph	The Agricultural Adaptation Council is a not-for-profit organization comprised of 66 Ontario agricultural, agri-food and rural organizations. It seeks to foster growth and innovation by delivering funding to industry clients through federal and provincial programs such as Growing Forward 2. In particular, they assist with the administrative aspect of these programs: writing & executing contracts, reviewing and processing claims, providing reporting and record keeping capabilities, and more.
CABI	Canadian Acceleration and Business Incubation	www.cabi.ca/	Toronto	Canada's voice for innovation through Business Incubation and Acceleration by fostering collaboration between business incubators, accelerators and the Canadian government. Supports the growth of best Business incubation practices across the country through information dissemination to all regions of Canada.
CAAP	Canadian Agricultural Adaptation Program (2014-2019)	www.agr.gc.ca/eng/?id=1396016168338	Ottawa	A five-year, \$50.3 million program providing non-repayable contributions for industry-led projects that help the agriculture, agri-food, and agri-based products sector to adapt and remain competitive.
CFI	Canada Foundation for Innovation	www.innovation.ca	Ottawa	CFI strives to build Canada's capacity to undertake world-class research and technology development. CFI investment in state-of-the-art facilities and equipment, universities, colleges, research hospitals and non-profit research institutions are attracting and retaining the world's top talent, training the next generation of researchers, supporting private-sector innovation and creating high-quality jobs.
CFWI	Canadian Food & Wine Institute	www.canadianfoodandwineinstitute.ca	Niagara-on-the-Lake	At Niagara College campus, on-site 40 acres of vineyards, hop yard, culinary gardens and greenhouse integrated with a teaching winery, brewery and restaurant. Provides students valuable hands-on farm-to-table experience. Offers a variety of programs in all aspects of culinary, beer, wine and innovation to its 700 students.
CIGI	Canadian International Grains Institute	www.cigi.ca	Winnipeg	Not-for-profit working with the grain and field crop value chain throughout Canada and internationally to drive the development and utilization of Canadian agriculture products.
CTFF	Canada's Technology for Food	www.techtriangle.ca/	Waterloo	A project that is designed to produce innovative technology solutions for food and beverage processors. It brings together industry and academic partners with the goal of identifying challenges and opportunities for improvement. It matches industry partners with a consortium of solution providers to commercialize technology, optimize processes and grow the food industry. Originally led by Ted McKechnie, former president of Maple Leaf Foods; as of August 2014 led by Conestoga College.
GF2	Growing Forward 2	www.ontario.ca/growingforward2	-	A federal-provincial initiative that encourages innovation, competitiveness and market development in Canada's agri-food and agri products sector. In Ontario, GF2 offers resources, tools and cost-share funding assistance to eligible producers, processors, organizations and collaborations to grow their profits, expand markets and manage shared risks.

IFPT	The Institute of Food Processing Technology	www.ifpt.ca	Cambridge	Ontario's first and only engineering and technology centre focused on providing leading edge training in the state-of-the-art food and beverage manufacturing facilities with the latest technology in robotics and automation. IFPT's pilot plant incorporates a full scale assembly line mimicking a real-world facility, and develops corporate training based on food processor's requirements.
InBIA	International Business Incubation Association (Connected NBIA)	www.inbia.org	Athens, OH	World's leading organization advancing business incubation and entrepreneurship. Each year, it provides thousands of professionals with information, education, advocacy and networking resources to bring excellence to the process of assisting early stage companies.
MAHRN	Manitoba Agri-Health Research Network	www.mahrn.ca	Winnipeg	Promotes Manitoba's capacity and capabilities for the testing and assessment of plant and animal-based bioactive compounds and supports the commercialization of these bioactives as functional foods, food ingredients and natural health products through project coordination, communications, outreach and test market services.
NBIA	See InBIA, above	-	-	-
NSERC	Natural Sciences and Engineering Research Council of Canada	www.nserc-crsng.gc.ca	5 Regional Offices	Invests in scientific discovery and talent, connecting researchers with subject matter experts in business with the aim of ensuring that businesses are the first to know, using discoveries to accelerate R&D.
ORF	Ontario Research Fund	Google it	Toronto	Provides research institutions with funding to help support the operational costs of large-scale transformative research of strategic value to the province.
SWOFITC	Southwestern Ontario Food Innovation & Technology Collaborative	No website	Kitchener	An organization leveraging partnerships to eliminate barriers to business growth and success.
Others:				
GMFF	The Great Manitoba Food Fight	Google it		The Great Manitoba Food Fight® features Manitoba food entrepreneurs who have developed, but not fully commercialized, a new and/or innovative food product. They will compete for one of three product development and service awards. These awards can help them accelerate commercialization activities for their product and business.
SFCA	Safe Food for Canadians Act	http://www.inspection.gc.ca/about-the-cfia/acts-and-regulations/regulatory-initiatives/sfca/eng/1338796071420/1338796152395		To protect Canadian families from potentially unsafe food, the Government of Canada tabled the Safe Food for Canadians Act on June 7, 2012. The Safe Food for Canadians Act, S-11, was adopted by the Senate on October 17, 2012 and passed by the House of Commons on November 20, 2012. On November 22, 2012, it received Royal Assent. The new Safe Food for Canadians Act consolidates the authorities of the Fish Inspection Act, the Canada Agricultural Products Act, the Meat Inspection Act, and the food provisions of the Consumer Packaging and Labelling Act. The Safe Food for Canadians Act: makes food as safe as possible for Canadian families; protects consumers by targeting unsafe practices; implements tougher penalties for activities that put health and safety at risk; provides better control over imports; institutes a more consistent inspection regime across all food commodities; and strengthens food traceability.

FTC	St. Angela's Food Technology Centre	www.thefoodtechnologycentre.ie	Lough Gill, Ireland	Committed to the development of the very highest standards in all areas of food production and supply, catering to the needs of the food industry including food production and processing, hotels, restaurants, catering and retailers.
TEAGASC	Agriculture and Food Development Authority (Ireland)	www.teagasc.ie	Carlow, Ireland	The national body in Ireland providing integrated research, advisory and training services to the agriculture and food industry and rural communities.

APPENDIX A

Article “Universities tap into growth in craft beer industry by offering business classes”, Vancouver Sun, January 3, 2016.

Universities tap into growth in craft beer industry by offering business classes

BY LISA RATHKE, THE ASSOCIATED PRESS JANUARY 3, 2016



Craft beers are served at the Maine Beer Company in Freeport, Maine. With an explosion in growth in the craft beer industry over the last decade, some universities are now offering classes on the business of craft beer. One of the newest is an online certificate program being offered by the University of Vermont starting in February.

MONTPELIER, Vt. — With an explosion in growth in the craft beer industry over the last decade, it's not enough to simply have a passion for brewing and beer when it comes to starting a brewery or working for one as the industry gets more competitive.

Recognizing that, some universities are now offering programs on the business of craft beer.

In the last decade, the number of craft breweries has grown to more than 4,000 in the U.S. today, from more than 1,400 in 2005, according to the Brewers Association.

A lot of breweries started out five or 10 years ago with a focus on beer, said Gregory Dunkling, director of the University of Vermont's new online business of craft beer certificate program, which starts in February. Back then, a home brewer may have been able to create some great recipes but didn't have the business acumen so along the way hired staff to cover marketing, sales, the business operation, he said. It's harder to pull that off today.

As the industry has grown and become more competitive, the bar has been raised for those starting a brewery or working for one, said Bart Watson, chief economist with the Brewers Association.

"Certainly the demand for people with a high level of brewing knowledge has gone up and on the business side as well. So I think we're seeing a variety of different programs look for ways that they can capitalize on that," he said.

Portland State University in Oregon started an online business of craft brewing program in 2013, with the first cohort filling up in the first week with around 40 people. It's become one of the school's most successful professional certificate programs, drawing people from around the world, said Scott Gallagher, the university's director of communications.

"We discovered that there's a huge need for people who wanted to get a certificate. They didn't necessarily want to go to college or already had a college degree and wanted to open up a brew pub," Gallagher said. They needed some basic and more advanced knowledge, such as in marketing, he said.

The demand is so high that PSU is looking at how to develop and expand the program, Gallagher said.

"The truth is ... it's not all about brewing and drinking beer. There's a lot of business behind it as well and that's usually what they're lacking," he said.

University of Portland and San Diego State University's College of Extended Studies also have business of craft beer certificate programs. Classes for San Diego State's program are held at local breweries and at the university, but not online.

So far, the University of Vermont program, in a state that has made a name for itself for its craft beers, has drawn applicants from around the country — Arizona, Florida, Georgia, Oregon and Texas, and about half are from the Northeast, Dunkling said.

The program costs about \$4,400 for the two courses: one on the fundamentals of craft beer and a second course of students' choosing focused on digital marketing, sales or business operations. Apprenticeships with a network of breweries and distributors are also available.

Industry officials agree there's a need for education and knowledge in the industry and different ways to get it, whether through experience, hiring talent or training, which some breweries provide.

As outside investors and larger breweries become increasingly involved with craft brewing, Harpoon Brewery, which will be offering apprenticeships to the UVM students, feels a need to maintain its independence.

"Hiring talented people is a critical part of that effort," Rich Ackerman, Harpoon's director of human resources, said by email. But the company cautions anyone against thinking of craft brewing purely as a business.

"It's a passion project, first and foremost," he said.

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