

UTM CAREER CENTRE

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*INDUSTRY PROFILE:*

# Food Science & Technology



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# What Do Professionals in the Food Science Industry Do?

*Love food, science and trying new things? A career in food science and food and beverage processing provides an entrepreneurial culture that will allow you to take ownership, add value and grow!*

## Overview

We all have to eat. Food is elemental to our being and food scientists, technologists and processors work together to bring the food and beverages we consume to our grocery stores and tables. Food science, technology and food processing are distinct yet interrelated disciplines. Food scientists apply scientific disciplines including microbiology, chemistry, engineering, and nutrition to the study of food to improve its safety, nutrition, wholesomeness and availability. Food technologists apply food science to selecting, preserving, processing, packaging, distributing, and using safe food. Food processors use chemical, biological and mechanical processes to convert relatively bulky, perishable, and typically inedible raw food materials into shelf-stable, convenient, and palatable foods and beverages.

Watch these brief videos to an [overview](#) of careers in [food science](#) and [food processing](#). Following is a taste of the many roles available in food science and technology and food and beverage processing:

## Food Scientists

Develop new ingredients, processes and food products while ensuring high-quality, nutritious, affordable and safe products and processes for consumers. In Canada, food scientists work in the dairy, meat, grain, seafood, bakery, beverage and confectionary sectors. A typical day on the job can include hands-on development of formulations, researching ingredients, experimenting with applications, yield testing, finished product sampling, working with colleagues in regulatory, analytical, innovation, culinary and sensory teams and participating in customer plant trials.

## Food Science Technologist

Provides accurate nutritional information for food labelling, does shelf-life studies, tests the safety and quality of food, develops recipes using newly-discovered ingredients, modifies foods such as creating fat-free varieties and uses panels or consumers to evaluate products.

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# What Do Professionals in the Food Science Industry Do? (cont.)

## Food Product Development Technician

Designs and develops new products for various retail customers from initial concept to full production, conducts initial plant trials and evaluates consumer response to the product. These technicians develop ways to improve or enhance consumables, and may create new flavours of foods. They may also make foods more nutritious to eat or digest. The job will typically include kitchen trials and making sure that the specifications are documented for each new product.

Both quality assurance and quality control involve the process of ensuring that products are manufactured correctly and that ingredients and finished products are tested and meet safety and quality specifications.

## Quality Assurance Technicians

Review food safety processes and procedures and ensure that food complies with government regulations. They extract samples as food and beverage products move down a production line, checking for weight, colour, consistency, and texture. They take measurements and check for quality using scales, visual examinations, and taste tests. They will also compare one batch with another to ensure a consistent product from batch to batch, and remove any inferior products they find.



Several Ontario colleges offer diploma and post-diploma programs in food science and technology and food processing, for example, Centennial's one-year Food Science Technology Fast Track, Conestoga's one-year Food Safety and Quality Assurance – Food Processing, and Operations Leadership in Food Manufacturing, and Culinary Innovation and Food Technology, offered at Niagara College's Canadian Food and Wine Institute.

[Check here for more information](#)

# Fast Facts

## Almost 10,000...

manufacturing plants supply approximately 75% of all the processed food and beverage products in Canada and are the largest buyer of the food Canadian farmers grow.

## With over 240,000 people...

food and beverage processors are Canada's leading manufacturing sector employer providing jobs; more than the auto and aerospace industries combined.

## In 2018...

Canadian processed foods and beverages accounted for 61.5% of export sales with a value of \$36.5 billion, with the majority going to the U.S., followed by China and Japan.

## Ontario's food and...

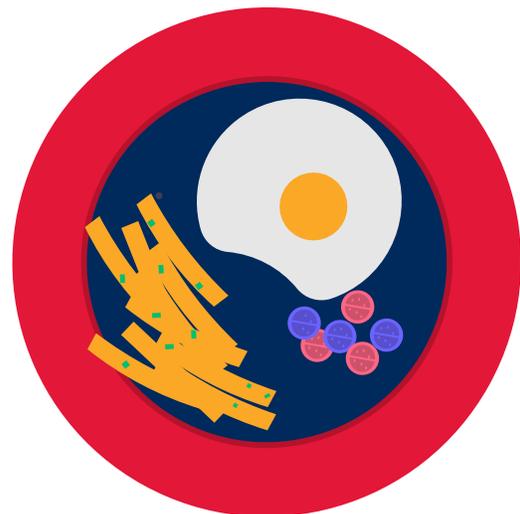
beverage processing sector is the largest in Canada – accounting for 37% of the industry's revenue in the country. The sector has more than 4,000 businesses in the province, employing over 95,000 people in 2018.

## More than 90%...

of Ontario establishments are small or micro with fewer than 100 people and one quarter is located in rural communities.

## Ontario is the leading...

exporter of processed food and beverages, at more than \$10 billion in 2018.



# Industry Trends

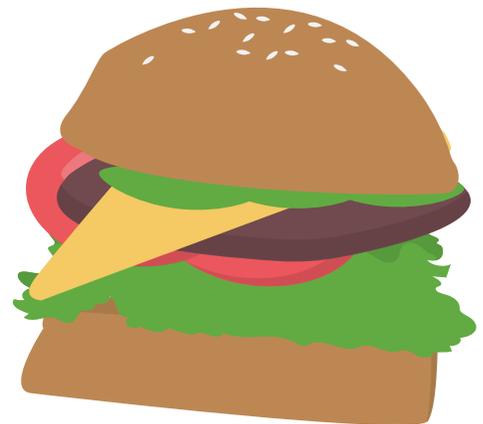
*Although Canada's food and beverage processing sector is the largest manufacturing employer in the country with almost 10,000 businesses providing over 240,000 direct jobs, the industry is facing a serious labour shortage.*

## Overview

Food and Beverage Canada, an industry association, estimates that by 2025, food and beverage manufacturing businesses across Canada will have up to 100,000 unfilled positions. Read more about this in the following Employment Outlook section. What's more, a 2019 Senate Committee report on growing Canada's value-added agri-food sector points out that Canada currently processes only half of its agricultural output, which shows it is vastly underdeveloped. With a domestic population of over 37 million people and a market representing about 2% of global GDP, Canada is a relatively small market. The food and beverage processing sector therefore needs access to international markets to be competitive and increase or sustain its growth.

## Consumer Expectations

At the same time, consumer expectations in food are shifting. Recent trends include a growing interest in more plant-based diets – less meat and dairy, spurring meat substitutes such as the Beyond Beef burger and even cultured “meat” made in the lab. Many people want healthier food choices with less sugar and fat and free from antibiotics. The local, organic and vegan movements are growing as are concerns about the environmental impact of the food we eat. Consumers are looking for sustainable practices from food producers, which reduce packaging and waste, especially plastics, and lower the carbon footprint. These expectations mean that food and beverage processors need to develop new, innovative products for the domestic and international markets. They must also adopt business practices such as traceability in their supply chains, eco-friendly packaging and zero waste.



## Limited Resources

However, since 94% of food and beverage processors are small and medium-sized businesses, they often have very limited resources. This can hamper their ability to carry out research and development or to find international customers.

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## Industry Trends (cont.)

### Canadian Agricultural Partnership Investment

To help the industry meet these challenges, the Canadian Agricultural Partnership is investing \$3-billion through federal, provincial and territorial governments to support research, innovation and growth in the country's agri-food and agri-products sectors. The program provides cost-share funding to for-profit organizations, bringing together industry, technology specialists, academia and government to work together to add sustainable value to the industry, according to Canadian Food Innovators. So far, the federal/provincial partnership has committed support to more than 2,400 projects to help eligible Ontario farmers, processors, businesses and sector organizations innovate and grow.

### Innovation Hubs

Notably, Ontario is considered a research hub and a leader in food technology and innovation, with research centres and collaboration between industry and postsecondary institutions, for example, the Guelph-based Ontario Agri-Food Innovation Initiative. Another innovation hub is the Toronto-based non-profit, District Ventures Kitchen. This food incubator provides commercial kitchen space and programs to help early-stage food processors commercialize and scale up their innovative food products.

### Environmental Impact

With respect to environmental impact, in November 2019, Canadian-owned Maple Leaf Foods Inc. announced that it believes it is the first major food company in the world to be carbon neutral. CEO Michael McCain said that since 2015, the company has reduced its emissions and invested in environmental projects to become carbon neutral in an effort to be the world's most sustainable protein company and meet consumer demand for corporate responsibility on climate change.

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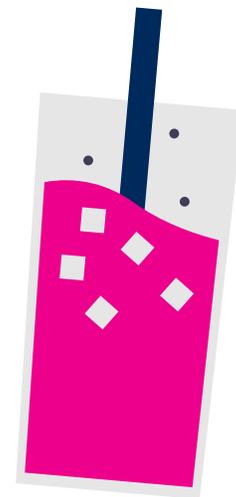
## Industry Trends (cont.)

### Government Regulations

Besides the need to develop new food products and alter operating practices to appeal to consumers' changing tastes and values, food and beverage processors must contend with a slew of new government regulations. These include things like new food safety regulations, an updated nutrition facts table, truthfulness in labelling, front-of-package for nutrients of concern and Canada's Healthy Eating Strategy. For example, Food and Consumer Products of Canada, an industry association, has stated that food processors are concerned with the costs associated with proposed government regulations on front-of-package labelling. If implemented, Agriculture and Agri-Food Canada estimates the costs at \$1.8 billion. As a foundation to its Healthy Eating Strategy, Health Canada is using a daily value (DV) criteria to define what is "a lot" of saturated fat, sugar and salt. If a product contains 15% of the DV, Health Canada will require companies to have warning labels on the front of packages. Some industry representatives feel that front-of-package labels oversimplify what makes a product healthy, noting nutrient-dense products like dairy will be required to carry a warning label, while empty-calorie snack foods will not.

### The Road Ahead

Notably, Ontario is considered a research hub and a leader in food technology and innovation, with research centres and collaboration between industry and postsecondary institutions, for example, the Guelph-based Ontario Agri-Food Innovation Initiative. Another innovation hub is the Toronto-based non-profit, District Ventures Kitchen. This food incubator provides commercial kitchen space and programs to help early-stage food processors commercialize and scale up their innovative food products.



# Employment Outlook

## Overview

Since the Canadian Occupational Projection System (COPS) groups similar occupations across various industries, it does not provide specific employment outlook information for professional roles in the food and beverage processing industry.

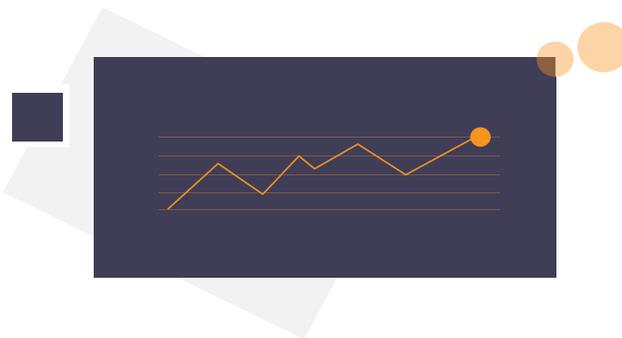
However, labour market information gleaned from a number of other sources indicates that the industry is experiencing significant labour shortages, estimated to grow by 2025 to as many as 100,000 unfilled positions. Michael Burrows, co-chair, Food and Beverage Canada and chief executive officer, Maple Lodge Farms said, “Measures focused on addressing the current labour situation – including a new three-year immigration pilot, Canada Training Credit for workers and support for underrepresented groups and small businesses – will help support industry’s own efforts to fill vacant jobs and enhance employee skills.”

## Meat Processing and Mushroom Production Industries

Specifically, over the past several years, industries such as meat processing and mushroom production have experienced ongoing problems finding and keeping new employees. The immigration pilot aims to attract and retain workers by providing them with an opportunity to become permanent residents.

## Increase in GDP

A 2019 report commissioned by Food Processing Skills Canada states that gross domestic product (GPD) from the food and beverage processing industry will increase by 1.3% annually between 2017 and 2026 and that employment will increase by 0.5%. Although this projection appears to contradict the industry’s assertion that jobs are going begging, a search of Careersinfood.com, an industry job board, shows hundreds of positions advertised in Canada at all levels, from senior executives, to food scientists to quality control officers.



Since food is a necessity, it is generally less affected by fluctuations in the economy. Production is anticipated to continue growing and even accelerate as a result of foreign demand and a low Canadian dollar. Also, Canada’s food and beverage manufacturers have a reputation for both high food quality standards and safety standards, which help build an international consumer base.

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# Employment Outlook for Communicators (cont.)

## Food Safety Regulations

As food safety is an increasing concern among the public leading to recent government modernization of food safety regulations, there is a greater demand for individuals trained in food safety, quality control and food science.

## Food Processing in Toronto

More than half of all food processing in Ontario takes place in the Toronto area, which has one of the biggest clusters of food manufacturers in North America. Toronto serves as headquarters for several major companies in the industry, including Campbell Company of Canada, Cargill Limited, George Weston Limited and Nestlé Canada. The region is also a leader in specialty foods, particularly ethnic and fusion goods, because of its diverse population.



## Industry Growth

The federal Advisory Council on Economic Growth singled out the food and beverage processing industry as one to focus on in the coming years. The Globe and Mail quoted Council Chair Dominic Barton as saying, “There’s going to be a massive demand for food, for protein, over the next 10 to 20 years. It’s also a big employment provider, and we could generate even more employment – and high-skilled employment – because of technology. We’re going to have about 2.4 billion new middle-class consumers in the world in the next 15 years, and they want to live and eat like we do. Of that 2.4 billion people, at least 1.8 billion will be in Asia. China, India and Indonesia, those are the big three. Food demand is going to go up by at least 50 to 70 per cent in the next 30 years. The Canadian brand on food is good – we’re well positioned. I’m very excited by that opportunity.”

## What You Need To Succeed

In addition to an excellent grounding in scientific disciplines and their application to food, professionals in the food science and food and beverage processing fields should have good business, analytical and numerical abilities. They must also pay meticulous attention to detail, particularly with respect to health, safety and hygiene. Food scientists must be curious and creative, with strong communication and good teamworking skills. Excellent project and time management, a strong commercial awareness and problem-solving abilities round out the skill set for success in this field.



Quality assurance professionals must be knowledgeable about all food safety standards mandated by government regulations. Common standards include the Hazard Analysis and Critical Control Points (HACCP) management system required by the Canadian Food Inspection Agency, Health Canada and the standards set by the Safe Quality Food Institute (SQFI).

## In-Demand Jobs and Salary Ranges

Job Title	Salary Range
Food Scientist/Technologist	\$ 33,150 – \$ 81,218
Laboratory Technologist	\$ 32,795 – \$ 98,748
Microbiology Technician	\$ 27,366 – \$ 63,173
Product Developer	\$ 50,000 – \$ 80,000
Production Manager	\$ 37,323 – \$ 142,800
Quality Assurance Technician	\$ 27,300 – \$ 57,340

## Where the Jobs Are

These industries show the strongest demand for food science professionals:

- Food and Beverage Processing Companies
- Food and Product Laboratories
- Food Service Companies
- Government
- Non-profits
- Research Centres
- Universities



## Industry Associations

Industry Associations	Website Link
Canadian Food Innovators	<a href="http://canadianfoodinnovators.ca/">http://canadianfoodinnovators.ca/</a>
Canadian Food Inspection Agency	<a href="https://www.inspection.gc.ca/eng/1297964599443/1297965645317">https://www.inspection.gc.ca/eng/1297964599443/1297965645317</a>
Canadian Institute of Food Science and Technology	<a href="https://www.cifst.ca/">https://www.cifst.ca/</a>
Careers in Food.com	<a href="https://www.careersinfood.com/">https://www.careersinfood.com/</a>
Food and Beverage Canada	<a href="https://fbc-abc.com/">https://fbc-abc.com/</a>
Food and Beverage Ontario	<a href="http://www.foodandbeverageontario.ca/">http://www.foodandbeverageontario.ca/</a>
Foodgrads.com	<a href="https://foodgrads.com/#/">https://foodgrads.com/#/</a>
Institute of Food Technologists	<a href="https://www.ift.org/">https://www.ift.org/</a>
Taste Your Future	<a href="http://tasteyourfuture.ca/about-us/">http://tasteyourfuture.ca/about-us/</a>



# Where to Find More Information

## Additional Sources

- [Canadian Food Inspection Agency](#)
- [Canadian Institute of Food Science and Technology](#)
- [Food and Beverage Canada](#)
- [Food and Beverage Ontario](#)
- [Institute of Food Technologists](#)
- [Taste Your Future](#)

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