

Growing Opportunity

Canada's plant-protein potential

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Message from Interim CEO Frank Hart

It feels appropriate that I'm writing this message for the fall issue of Protein Industries Canada's magazine. Like the seasons, our organization is in a transition period, though we haven't slowed in our work to grow Canada's ingredient manufacturing, food processing and bioproducts sector.

In 2017, I advocated for the creation of Protein Industries Canada because I believed Canada could punch above its weight in the area of ingredient manufacturing and food production, and I still believe that to be true today. That's why I agreed to be interim CEO of Protein Industries Canada, and why I'm working to help create the framework for the next iteration of Protein Industries Canada to support the continued growth of our sector.

The organization has a solid foundation from which to work. During this second round of funding, we've contracted more than 22 projects, with more than \$144 million committed to them between Protein Industries Canada and our members. This builds on the success of our first fund, helping bring us to 72 contracted projects and more than \$578 million committed throughout our lifespan.

The outcomes we've seen from these projects—from

new crop breeds, to new ingredients, to new protein options on grocery store shelves—prove that this sector has potential. That's potential for innovation, potential to help meet consumer demand, potential to help solve global challenges and potential to reach \$25 billion in annual sales by 2035. All mean great things for Canada, but the last in particular can have significant impacts on our economy. It will enable a five-fold increase in value from Canadian crop commodities and increase Canada's current agrifood industry GDP by over 15 per cent by 2035, while supporting the creation of 15,000 to 20,000 new jobs.

Now is the time to consider what we do next, as an ecosystem and an organization, to help make that potential a reality. To reach our \$25 billion goal, we need to keep focused on innovation, but we also need to support the scale-up of Canadian companies and the commercialization of Canadian IP in Canada.

I hope you'll join us in that work.



It's time to transform

As Canada struggles with declining productivity and the impact of slower wage growth, there is an urgency to do something.

As a country we need to foster the growth of globally competitive companies in sectors that are stable, resilient and capable of improving Canada's current economic plight.

One of those industries is ingredient manufacturing and food production.

Canada's agriculture and food and beverage industry has been one of our best-performing sectors in terms of productivity growth. Productivity in Canada's food and beverage industry increased 2.4 per cent between 2019 and 2020—a growth rate of 1.5 times that of the overall labour productivity growth in Canada.

By taking a strategic and thoughtful approach to high-

growth sectors, such as agriculture and food production, through the creation and implementation of industrial policy, Canada will be in a position to help solve such global problems while adding \$50 billion to our GDP within the next 10 to 15 years.

Learn more via the QR code below.



Cover photo: Processed lupin beans

Securing a competitive advantage by seizing IP white space opportunities

Canada's plant-protein ingredient manufacturers and food processors are innovating at an accelerated rate. Each year brings new products to grocery store shelves and restaurant tables, helping meet the global demand for new protein options. And the progress being made in new technology means more opportunity is ahead.

"We are at the beginning of the plant-based protein revolution," Burcon NutraScience's CEO Kip Underwood said. "The plant-protein market, in particular, is ripe for innovation. Consumers are demanding better-tasting, healthier and more sustainable foods. Meeting consumers' needs will require better plant proteins, which, in turn, requires disruptive innovation."

Over the past several years, and through two Protein Industries Canada projects, Burcon has been developing and scaling production of their canola, hemp and sunflower protein ingredients. Each is a relatively new protein source, particularly in Canada, where the majority of innovation in the area to date has focused on more traditional protein crops.

This switch to newer crops isn't unique to Burcon. According to Jennifer Jannuska, Protein Industries Canada's Director of Data and Intellectual Property, a new Patent Landscape Report indicates that companies across the value chain are shifting both their crop and patent focus. Patent filings suggest that, where soy was previously the dominant crop used in the production of plant-based ingredients and products, companies are now most often utilizing peas, with crops such as fava, canola, hemp, lupin and sunflower increasing in R&D activity.

"It suggests there's a good white space in non-pea-, non-soy-related technologies," Jannuska said. "So some of the emerging protein crops that grow really well in Canada ... those would be some of the white spaces that we see, as well as lots of room for processing technologies and improvements to flavour and texture."

Jannuska explained that the Patent Landscape Report, released by Protein Industries Canada in September 2024, is a great resource for companies to better understand where such white spaces may exist. Outlining crops of focus in the sector alongside the type and number of patent filings made by companies across the value chain, it helps companies better understand where they have freedom to operate.

"Freedom to operate really refers to ... not being inhibited by other people's [IP] rights. A patent is an exclusionary right—the right to keep [others] out of a particular kind of territory, and working in white spaces makes sure that you have the maximum freedom to operate," Jannuska said.

Planning and filing IP is critical to helping companies scale and commercialize their products. Jannuska explained it can help companies maintain their competitive edge in both Canadian and international markets, while protecting their work.

Underwood agreed, stressing how important a robust IP strategy is in helping ensure Burcon's success.

"Commercializing new products will always take time and resources. Securing new IP can ensure we maintain that competitive advantage, which, in Burcon's case, is important in any discussion with potential partners and prospective customers," he said. "Burcon has developed an extensive patent portfolio covering its novel plant-based proteins and the processes to produce them. We welcome any collaboration opportunities where we can together expand and enhance the plant-based food supply chain."

As innovation in the plant-protein space continues, companies across Canada's ingredient manufacturing, food processing and bioproducts sector will have the opportunity to expand their product offerings while securing their competitive footprint around the world.

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Growing a business with a new-to-Canada crop

The rising global demand for alternative sources of protein has increased opportunity for non-traditional crops throughout Canada. Alongside Canada's world-renowned supply of lentils and peas is now a growing supply of protein-rich crops such as fava, hemp and lupin.

"Lupin has significant potential as a protein ingredient for several reasons," said Lupin Platform CEO Tristan Choi. "Its protein content is notably high—comparable to soy, which is a leading source of plant-based protein. This makes it a valuable option in the rapidly growing plant-based food sector, where demand for protein alternatives is surging."

For the past four years, the Lupin Platform team has been focused on expanding the opportunity for lupin development across Canada. By working with farmers, the company can ensure the versatile bean has the

characteristics needed to become a functional protein ingredient—meeting the taste, texture and nutritional needs consumers are looking for.

Through this work, Choi and his team have developed uses for lupin in a variety of meat alternatives, protein shakes, baked goods and dairy substitutes, as well as livestock feed. Though still growing in popularity, the bean shows promise as an ingredient in all areas, particularly for its nutritional components.

"Lupin has a low glycemic index, making it ideal

for diabetic-friendly or health-conscious products. Additionally, it is nono-GMO, gluten-free, and rich in fiber and essential nutrients, further enhancing its appeal in functional food applications," Choi said.

At the same time, lupin has additional characteristics that positively impact livestock production.

Lupin beans, lupin pasta, and lupin flour.

We had four years of drought and somewhat challenging growing conditions, but we are building a resilient group of growers to successfully work through those challenges and increase the farming footprints in Canada.

"Some dairy producers are looking for alternatives to canola and soybean meal protein supplement to mitigate methane and improve livestock production," said Lupin Platform's Director of Lupin Protein Development Alphonsus Utioh. "Studies have shown lupin seed meal supplemented to dairy cow diet improves butterfat concentration of the milk and decreases methane production in cows' digestion. A similar study conducted by Lupin Platform showed a slight improvement in milk production."

With such opportunity ahead, the Lupin Platform team has had plenty of success attracting collaborative partnerships to advance their R&D work. This includes domestic partnerships with Canadian producers, processors and retailers, as well as international organizations to help grow the market globally.

It also helps address some of the challenges associated with growing and processing the bean. A particular challenge, Choi explained, is Canada's growing season.

"Lupin's late maturity can be a challenge in regions with shorter growing seasons, as it limits the crop's adaptability in cooler climate," he said. "We have screened over 25 different varieties over the span of decades to identify earlier-maturing varieties that can thrive in a broader range of Canadian growing climates, including those with shorter growing windows."

Despite such challenges, the Lupin Platform team has made significant progress in expanding the crop's popularity and use across the ingredient manufacturing, food processing and bioproducts ecosystem. And that popularity is only expected to grow.

"[We] can say that we have successfully brought lupin as a protein crop into [the] North America market," Utioh said. "Through toll manufacturers, we are producing and marketing lupin flour and protein isolate in the food industry. We had four years of drought and somewhat challenging

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As Lupin Platform builds their brand and their supply chain, they expect to centralize their work under a single facility in Canada. Based on their work so far, it won't be long before that facility is contributing to the growing success of

Canada's ingredient manufacturing, food processing and bioproducts sector.



Ice cream made from lupin beans.



How an increase in plant protein processing is leading to innovative starch and fibre use

The growing demand for protein options around the world has led to an increase in innovative ingredient development in Canada. With this increase in protein ingredients, however, comes an increase in their co-products, such as starches and fibres. Supporting innovation in their use is an important element in not only strengthening Canada's ingredient manufacturing, food processing and bioproducts sector, but also in helping it become more sustainable.

The idea of using starches and fibres certainly isn't new to many companies. BioNeutra, for example, has used starch derived from corn and tapioca as their primary ingredients since the company's launch in 2003. This allowed them to create low-calorie sweeteners with fibres built in, a combination in high demand among their customers.

As Canada's alternative protein sector grew, however, so did BioNeutra's opportunity to begin utilizing starch derived from crops grown here at home.

"With the advent of the plant-based protein industry

VitaFiber powder from BioNeutra. Photo provided by BioNeutra.



in North America, and the much wider availability of plant-based starch here in North America, we're looking repatriating production in large-scale production in North America," BioNeutra Chief Operating Officer Steve Jakeway said.



Steve Jakeway, Chief Operating Officer, BioNeutra

BioNeutra recently partnered with Roquette in a Protein Industries Canada project aimed at supporting the development of the new pea starch ingredients, as well as a variety of other ingredients and food products with other project partners Prairie Fava and Plant Up. This new level of collaboration, Jakeway said, felt like a natural progression in BioNeutra's work in its starch innovation.

"The collaboration with pea and others in the North American sphere is kind of organic," he said. "The availability, through the plant-based industry, particularly yellow pea ... and the wet processing allows us to have very high-quality starch. We've kind of grown hand-in-hand with that industry; as it's become more available, we're taking a look at different options for our material."

After initially focusing on starches derived from non-protein crops, this move toward protein-derived starch has given BioNeutra a new footing in the ingredient market. With pea being a widely available crop in Canada, it means BioNeutra has a reliable source for their products that doesn't need to be imported, making it more sustainable both economically and environmentally.

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Protein Industries Canada opens call for blended pulse and cereals projects

Protein Industries Canada is now accepting expressions of interest (EOIs) for a new round of technology projects with a focus on the blending of pulses and cereals to create the next generation of high-protein, plant-based ingredients and food products.

Through this call, Protein Industries Canada is looking to invest \$10 million into projects to explore the benefits and potential of blending cereals and pulses. This is the first time that Protein Industries Canada has issued a call specifically to cereal-based projects. Previous projects focused on establishing the innovation infrastructure for crops such as peas and fava. While that support remains, it is recognised that expanding to include more cereals is key to furthering Canada's ingredient manufacturing and food processing sector and building a stronger ecosystem overall.

In addition to the expanded call, Protein Industries Canada will also now allow consider projects to be considered with a minimum of two collaborators, a decrease from the previous three. One partner must be an SME, Pprojects must include the use of a high-protein dryland crop and approved projects may receive up to 45 per cent reimbursement of eligible costs. EOIs will be accepted until Jan. 16, 2025.

To learn more, follow the QR code below.



VitaFiber syrup from BioNeutra. Photo provided by BioNeutra.

It also sets them apart from their competitors—a characteristic Jakeway said is important to any company looking to find its place in the growing ingredient market.

"Find something that's unique, find something where you have a niche market to play, and if you can use ingredients that allow you to have a differentiation in the market, or a different marketing story, so much the better," Jakeway said.

As companies like BioNeutra continue to invest in protein's co-products, Canada's ingredient manufacturing, food processing and bioproducts sector will continue to grow, helping it reach its \$25 billion potential.

Plant genetics are key to competitiveness from field to fork

By Vicki Dutton and Protein Industries Canada

Canada's successful role in the global plant genetics industry is a testament to generations of public and private investment in plant breeding. This vision has led to developing a diverse supply of crops and varietal choices in Canada, making us a global leader in plant genetics—genetics that are key to helping Canada meet its \$25 billion potential in the ingredient manufacturing, food processing and bioproducts sector.

The meticulous process of varietal selection and testing for yield, standability, and disease resistance is a cornerstone of the industry. Shannon Hood-Neifer, Chief Science Officer of Lovingly Made, underscores

the importance of understanding varietal protein, oil and water absorption, and pasting properties.

These tests are crucial in paving the way for a more diverse varietal selection process, which will support an innovative ingredient manufacturing, food processing and bioproducts sector.

"An ingredient's functionality is based heavily on the characteristics of

the protein crop it's derived from. By focusing on developing the right characteristics at crop level, we can better ensure we're meeting the taste, texture and nutritional attributes food processors and, ultimately, consumers are looking for," Hood-Neifer said.

As part of their efforts to address varietal performance and ingredient functionality, Lovingly Made Flour Mills has partnered with Dutton Farms and TMRW Foods in a field-based research project as part of Protein Industries Canada's Technology Leadership program. The project aims to increase the varietal performance of protein and seed quality and enhance yield. This knowledge will help support a pulse in every farmer's rotation, while also improving the functionality of Canada's protein crops in ingredient development.

Heidi Dutton, CEO of Lovingly Made, has a farm background and a pragmatic approach to the future of plant genetics in Canada.

"In the rotation, a pulse crop must compete for acres with other crops, particularly canola and wheat," Dutton said. She suggests that the recent decline in pulse acres is a direct result of farmers choosing crops with a lower risk management profile. While pulses are the most environmentally sustainable crop in the rotation, she notes, they are also the crop with the

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highest risk management profile.

"The focus on yield and disease is essential to defining the silver bullets of the future," she said.

Vicki Dutton, Owner of Dutton Farms, is a select seed grower. She agrees that ingredient performance testing and genetic collaboration between producers, researchers, plant breeders and processors will be critical in maintaining Canada's competitive global advantage from "Field to fork."

"When we decide what to grow on our farm, we're having a direct impact on the food that ends up on the plates of families around the world," Dutton said. "By working directly with ingredient manufacturers and

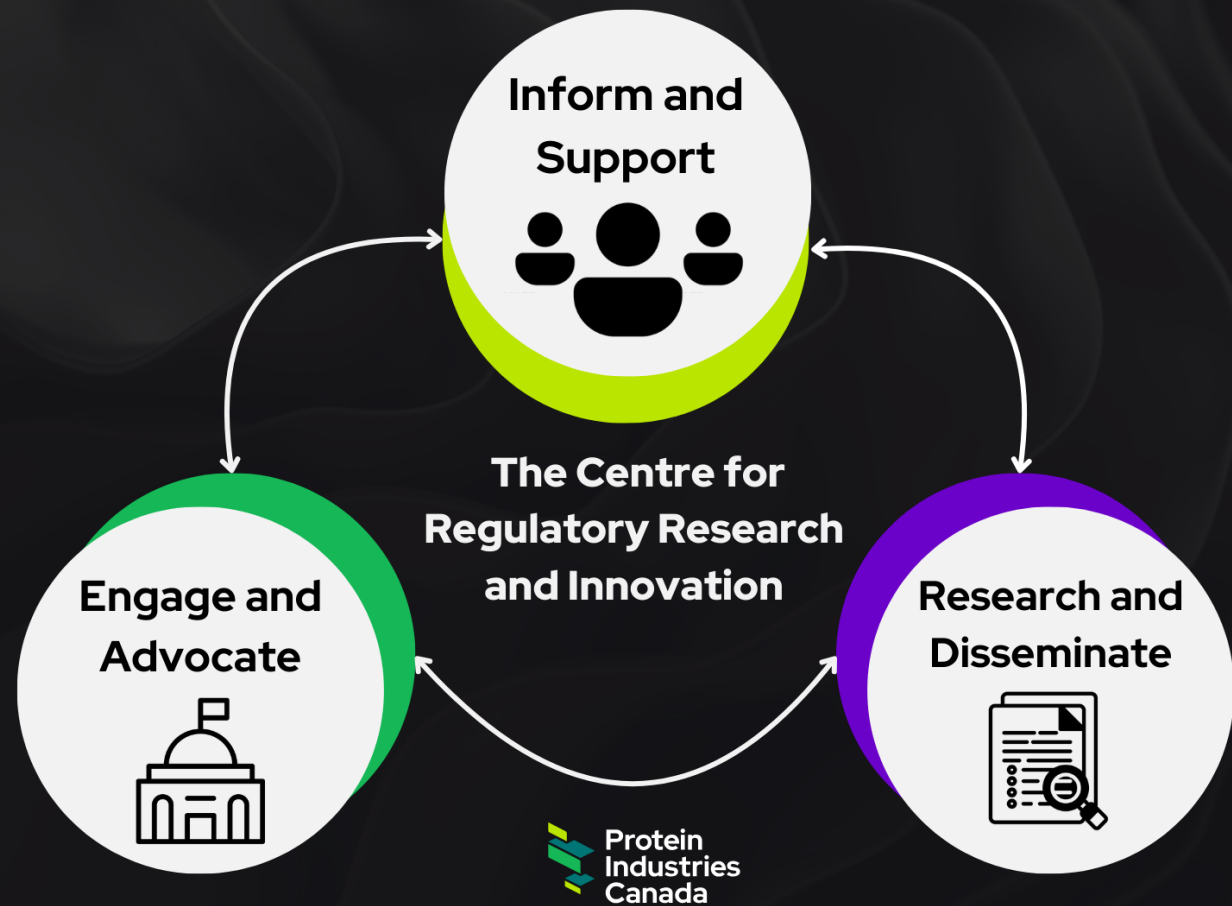
food processors, we can help make sure those crops are meeting their needs. It's valuable feedback for us as producers, and for the researchers developing new varieties."

Through their collaborative work, the partners will bring increased value to two of Canada's key protein crops—pea and fava. This full value chain approach is essential not only to the project's success, but also to helping strengthen Canada's ingredient manufacturing, food processing and bioproducts sector as a whole—a sector that can,

with the right focus on investment, unlock a \$25 billion opportunity for Canada.

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Centre for Regulatory Research and Innovation helping build support for innovation across Canada

A supportive regulatory framework is one of the most important elements in helping Canada’s ingredient manufacturing, food processing and bioproducts sector grow and thrive. Canada’s food regulations are highly regarded as some of the safest in the world, helping keep consumers healthy and informed through policies built on science. That doesn’t mean, however, that there isn’t room for improvement.

The Centre for Regulatory Research and Innovation (CRRRI) was announced by Protein Industries Canada in December 2023, to build on the success of the Regulatory Centre of Excellence. The CRRRI is focused on helping Canada’s plant-protein sector navigate existing food regulations while working

toward regulatory modernization, particularly in the areas of labelling, nomenclature and protein validation. Currently, there are 13 projects approved under the CRRRI’s mandate, various academic publications, and

domestic and international engagement with government, industry, and academia. With its focus on science-driven data, this work has garnered the support and partnership of industry and government alike.

“The feedback has been extremely positive, when we talk about what the CRRRI’s mandate is, how we’re approaching,

creating and enabling the regulatory policy and environment for Canadian innovation domestically and abroad,” said Protein Industries Canada’s Director

“Asking the right question and pursuing the right research can drive the datasets that perhaps will lead to regulatory modernization. From what I’ve seen from preliminary data, I’m very excited about what is coming and what the potential is.”

of the CRRRI Chris Marinangeli. “The work that we’re doing is getting attention. We’re being brought into discussions beyond the scope of our direct work. We’re being brought into the work of others as an organization, as a Centre, that can provide thought that is important to discussions and our ecosystem, but maybe right now aren’t a direct priority.”

This is, in large part, because of the CRRRI’s focus on research that help provide the data regulators and governments need in order to review and, hopefully, justify regulatory changes. By maintaining this focus on robust data, the CRRRI and its industry partners are ensuring Canadian regulations continue to prioritize food safety while supporting innovation. While this has meant facing challenges related to organization and unknown outcomes, the benefits of overcoming such challenges make the work more than worthwhile.

In particular, Marinangeli said, the CRRRI’s work could help reduce regulatory bottlenecks currently faced by the sector, bring Canadian context to global nutrition science, and increase opportunities related to and the speed of innovation in the ingredient manufacturing, food processing and bioproducts space. In essence, it can help get more food options onto Canadian plates sooner.

“The early work that we’ve completed and that we’re building upon actually demonstrates some positive outcomes related to regulatory modernization,” Marinangeli said. “It demonstrates that asking the right question and pursuing the right research can drive the datasets that perhaps will lead to regulatory modernization. From what I’ve seen from preliminary data, I’m very excited about what is coming and what the potential is.”

As the CRRRI continues its regulatory modernization work, it’s expected the benefits to Canadians and the Canada’s plant protein industry will only increase, helping strengthen Canada’s food supply chain while reaching the sector’s \$25 billion potential.

Learn more about the work of the CRRRI by visiting proteinindustriescanada.ca/crri.

Canada’s Agri-food Opportunity:

THE ROAD TO \$25 BILLION

Presented by Protein Industries Canada

How can Canada forge its path to become stronger and more competitive, sustainable and productive?

Ingredient processing and food manufacturing is key to building that path forward.

Industry experts within and adjacent to Canada’s agrifood sector explore opportunities and challenges to map out this journey.

The complete first season of *Canada’s Agri-food Opportunity: The Road to \$25 Billion*, the podcast presented by Protein Industries Canada, is now available wherever you listen to podcasts.

Watch for season 2, coming soon.

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Innovating for a more competitive Canada

Canada's plant-based food, ingredients and bio-based products sector is facing a \$25 billion opportunity. By expanding its capabilities in value-added processing, this sector of the future can drive economic growth and strengthen the food supply chain.

Investing in the potential of food and bio-based products in Canada can cement our position as a competitive and resilient powerhouse for the coming generations.

It's time to start the journey. Join us on the road to \$25 billion.

Learn more by visiting theroadto25billion.ca.

