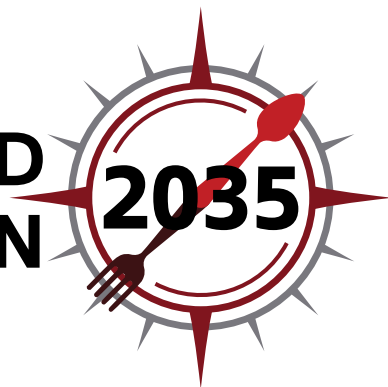




**THE ROAD
TO \$25 BILLION**



**FOR CANADA'S PLANT-BASED FOOD, FEED
AND INGREDIENT ECOSYSTEM**





THE ROAD TO \$25 BILLION: A ROADMAP TO PROSPERITY

When one opens a map on their phone — or, perhaps, even unfolds an old-school paper one — it is usually with one intention: to figure out how to get to a destination.

This is what a Roadmap signifies.

It represents a destination, it provides direction, it offers routes, it lays out options. This document is a Roadmap. We know where we need to go.

By 2035, we need to grow the plant-based food and ingredient sector to \$25 billion and provide the ingredients for 10 per cent of the world's plant-based food products. In broad terms, we know how to get there. We need capital, we need innovation, we need regulatory modernization, and we need access to talent, skills and labour. We also know that we are building a brand-new industry in Canada. One that will see the emergence of product categories and ingredients that don't exist today; one that will encounter consumer trends we've not yet imagined. The road will not be straight; we will take detours, we will have diversions, and we may encounter roadblocks. Regardless, we will be going in the right direction, and we will ultimately reach our destination.

This Roadmap is the culmination of three years of learning. It is built upon conversations, projects, initiatives and investments. It incorporates market research and data from several sources. It builds upon the work of the visionaries that knew a better future for Canada's agrifood sector was rooted in value-added processing and plant-based food.

Our learning has brought us this far, but we recognize that we are not yet finished. While this Roadmap is an important step forward on our journey, we know that there will be new information, and that this document — the outcomes and actions — will evolve as the industry evolves.

This Roadmap is meant to be guiding; it is not meant to be a path carved in stone and may not provide the most direct route, but we are confident in the direction. It is a pathway to a \$25 billion increase to Canada's plant-based food, feed and ingredient sector. As we have learned over the course of time, the right answers always lie in collaboration. This is an invitation to Canada's agrifood sector to become a part of the journey to providing the ingredients in 10 per cent of the world's plant-based foods.



EXECUTIVE SUMMARY

DESIRED OUTCOMES AND RECOMMENDATION ACTIONS

For the full description, please go to pages 18-26 of the Roadmap.

INNOVATE: Producing the plant-based ingredients and food of the future and creating new uses for co-products ensuring full-seed utilization.

DESIRED OUTCOMES				
RECOMMENDED ACTIONS	Canada is a hub for plant-based food innovation	A progressive regulatory system	Canadian plant-based food & ingredients are recognized as sustainable	Canadian innovations lead to commercialized products & services
	Increased investment into plant-based food & feed innovation	Adopt best practices for protein equivalency content	Technologies that reduce environmental footprint	Develop successful entrepreneurs to scale commercially successful businesses
	International research partnerships	Improve timeframes for novel food approval	Traceability systems that allow for data capture throughout the value chain	Increase Indigenous employment in Canada's agrifood sector.
	Aligned public research to support ingredient & food production	Consistent regulations with other food products	Collaboration across federal agencies	Create micro-credential & other re-skilling programs to quickly train new talent
	Attract global talent & under-represented groups	Creation of a regulatory centre of excellence		Support cross-department collaboration in post-secondary institutes.



SCALE: Achieve critical mass of ingredient processing and domestic food processing.

DESIRED OUTCOMES				
	Secure capital to support the growth of the processing sector	Build & expand domestic companies	Attract foreign companies to establish Canadian operations	Canada offers a competitive business environment to support greenfield construction
RECOMMENDED ACTIONS	Generate funds to support scale-up of plant-based food & ingredients	Advance ingredient & food-tech incubation/acceleration	Create a national strategy to attract FDI & work collaboratively to execute	Create large-scale processing parks across Western Canada
	Develop policies to manage risk for investors	Create processing, pilot plants & co-packing facilities	Create an investor-orientated FDI team with both domestic & international resources	Encourage coordination among provinces in respect to capital expenditure incentives
	Work with crown lending agencies to incentivize investment into plant-based sector.	Ensure companies have business acumen to leverage capital markets & commercialize products	Develop a suite of capital expenditure incentives	Better understand infrastructure & transportation needs to support the future growth of the sector.
	Create awareness within capital community & foster inclusivity of under-represented groups in capital markets.	Deploy programming related to re-skilling new Canadians in areas related to digital skills & food/ingredient manufacturing	Leverage foreign partners to promote Canada's plant-based foods sector.	Encourage coordination among municipal & provincial jurisdictions to create shovel-ready sites



PROSPER: To capture the value of increased ingredient processing and food production, to create wealth for Canada and benefit Canadians, and to support re-investment back into the sector.

DESIRED OUTCOMES				
	Canada's brand is globally recognized & respected	Canada delivers the world's most diverse, health-conscious, appetizing & consumer-focused products	Canadian companies take advantage of global opportunities	Canadian companies benefit from a highly integrated & nimble supply chain
RECOMMENDED ACTIONS	Define the Canadian plant-protein brand attributes & value proposition	Identify consumer wants & values in key markets and integrate into ingredient/food production	Offer mentorships & build business acumen of Canadian entrepreneurs that consider product development, access to capital, & how to compete globally	Create opportunities where players can collide, intersect & explore collaboration
	Market Canada's value proposition & diverse product offerings as unique on the global stage	Increase consumer awareness of the benefits of plant-based foods.	Position Canada as a global innovation hub & product test market	Incentivize value-chain driven innovation & product development
	Support companies in the development of a relevant & competitive brand(s)	Pursue white space market opportunities	Ensure that international trade-related agreements & negotiated market access evolve at the speed of the sector	Support a customer-centric approach to innovation
	Market & promote Canadian products & companies in key markets	Adopt manufacturing technology & data practices to maximize efficiencies, competitiveness & sustainability	Facilitate access to international markets & measurement of trade flows through HS codes that capture the diversity of plant-based products.	



GROWING CANADA'S PLACE IN A GLOBAL FOOD SYSTEM

The discussion around food — from diets and human health, to the role agriculture plays in climate change and our environment, to food insecurity and the vulnerability of supply chains, to how food is produced — are becoming increasingly prevalent and seemingly ever more connected and complicated.

The explosive increase in demand for plant-based foods comes at an ideal time for Canada. As the world's interest in consuming more plant-based food increases, Canada's plant-based sector grows. This demand, combined with the intricacies of the world's food systems, provides a once-in-a-generation opportunity for Canada. Global food systems are being redesigned as the world recovers from COVID-19, and as we grapple with population growth, mass urbanization, climate change, human health and nutrition, and income inequality. Investing in accelerating Canada's production of plant-based ingredients and food, while also serving the feed and bio-industrial markets, represents an opportunity for Canada to help address some of the world's greatest challenges.

Canada, with its access to land and water, innovative producers, abundance of raw material and sustainable agricultural production practices, can be a leader in how global agrifood systems are redesigned. By investing in the plant-based food, feed and ingredient sector, together, we will help address some of the world's greatest challenges and support national priorities of a strong economy with the benefits of a high-growth sector, while also supporting a healthy environment and healthy Canadians.

To navigate this complex landscape, we require a plan. This Roadmap is meant to set direction for Canada's plant-based food, feed and ingredient ecosystem to ensure we are all on the same path. It provides a framework for private industry, NGOs, government at all levels, financial institutions, the capital community, academic institutions, and public and private research institutions to guide activities that drive toward \$25 billion in sales by 2035.



FOOD SECURITY

“After decades of steady decline, world hunger has slowly been on the rise since 2015. An estimated 821 million people in the world suffered from hunger in 2018.

If nothing changes, the immense challenge of achieving the Zero Hunger Target by 2030 will not be achieved.”ⁱ

Demographic modelling indicates a rise in global population to almost 10 billion by 2050ⁱⁱ. The demand for food will not be met with current agricultural practices, current supply chain arrangements, and current diets. Canada, with the third-highest amount of arable land per capita, needs to help ensure global food security. There will be a need to increase the total amount of protein available, and innovations in plant proteins will help meet that need through the supply of highly nutritious food, livestock feed, or as feedstock for the bio economy or cellular agriculture.

COVID-19 demonstrated the fragility of Canada’s food supply chain; one of the most critical ways to avoid future shocks to our food system is to increase ingredient processing in Canada. Since 1992, the value of food imported into Canada has risen from 15 per cent to 31 per centⁱⁱⁱ, clearly indicating that, despite an abundance of agricultural commodities being produced in Canada, we are becoming more reliant on food produced in other jurisdictions, mostly the United States.

As a nation, we must place a priority on domestic food security. The first step toward that is ingredient processing.



CLIMATE CHANGE

“Observed climate change is already affecting food security through increasing temperatures, changing precipitation patterns, and greater frequency of some extreme events. Food security will be increasingly affected by projected future climate change.”^{iv}

Climate models suggest a different trajectory in Canada, one that could see a production increase as Western Canada’s environment becomes more amenable to crop production. Greater emphasis on the production of sustainable crops, such as peas, lentils, canola, hemp and cereals, will reduce agriculture’s carbon footprint and add organic matter and carbon to the soil. In addition, increasing value-added processing and consolidating supply chains will have a positive impact on climate change by allowing Canada’s agrifood sector to ship the right products and ingredient to the right customers and markets, which will increase the efficiency of transportation systems that currently send whole grains and seeds to markets that only want the proteins, oils or starches.

INDUSTRY INSIGHT

MAKING THE MOVE TOWARD CANADIAN-SOURCED INGREDIENTS

Transitioning Canada from an export-driven country to one that focuses on adding value to commodities at home can provide significant benefits for Canadians, ranging from new economic and job opportunities to achieving carbon neutrality goals.

“With the current climate crisis, one of ways to mitigate challenges is to reduce food miles,” TWC Nutrition CEO Shazad Bukhari said. “Sourcing Canadian ingredients equates to less travel time and a lighter environmental impact. Increasingly, consumers want to understand where their food comes from, to support local and to purchase quality.”

TWC Nutrition has been moving toward sourcing their ingredients from Canadian growers and processors throughout the past several years. The challenges presented by COVID-19 presented a particularly good reason, as it showed the need to strengthen the Canadian supply chain. By creating Canadian links from the farm to ingredient processor and food manufacturer, the plant-based value chain can ensure consumers across the country will have access to the foods and beverages they’re looking for.

“Supporting and purchasing from Canadian suppliers helps build our network and strengthen relationships,” Bukhari said. “In turn, together we can build a more resilient Canadian supply chain.”



SUSTAINABLE FOOD SYSTEMS

“About 21 to 37 per cent of total greenhouse gas (GHG) emissions are attributable to the food system. These are from agriculture and land use, storage, transport, packaging, processing, retail and consumption.”^v

Globally, the agrifood sector is under increasing pressure for decarbonization, waste reduction, and a transition to more sustainable packaging. Diets rich in plant-based foods will help address sustainability of the global food system by reducing GHG emissions. This combined with investment into production innovation, such as precision agriculture, will help reduce inputs and carbon emissions. Starch-rich co-products that result from protein extraction can serve as inputs in the development of bio-based packaging for the food industry.

INDUSTRY INSIGHT

A SUSTAINABLE SECTOR IS A STRONG SECTOR

The health of our environment and the health of the plant-based food, feed and ingredients sector are intertwined. One doesn't succeed without the other, nor do we succeed if our sustainability success stories aren't being shared.

“It's a really critical [area],” Ingredion Global Lead for Plant Protein Michael Natale said. “What we're cultivating and what we're taking from the farmers and then processing, there's a whole story there about grown, processed and delivered from Canada, or from Saskatchewan, that I think plays back to sustainability, that plays back to quality, and it plays back to security and the food supply.”

The sector has made great strides in the sustainability area, with Natale citing water use, regenerative agriculture, and the increased use of pulse crops as particularly important good news stories. He said, however, that he sees potential for more work in the area of establishing and proving metrics, especially for the sake of meeting consumer demand.

But while more metrics could be created, Natale said there's plenty of success to celebrate already, and the best way to do this is to share those stories of success.

“There is absolutely a story that needs to be told more-so, and stronger,” he said. “There is this opportunity — pulses from Saskatchewan, that I really believe Canada has to fortify and own better and stronger than anybody.”



HUMAN HEALTH

“Unhealthy diets claim more lives than any other cause of death. We need to address unhealthy diets to reduce the rapidly growing rates of diet-related disease that threaten to overwhelm our health-care system, and we need to shift to diets that are good for our health.”^{vi}

A global shift to more plant-based foods, as recommended by the revised Canada Food Guide, will slow the progress of chronic diseases and obesity, which will have dramatic effects on health-care costs. Plant and alternate proteins are part of the solution for healthier diets, healthier people and a healthier planet. Support for innovation in plant-based ingredient and food production will yield Canadian products that offer healthier choices for Canadian consumers. A balanced diet that includes plant-based foods can lead to better health outcomes and a reduction in health-care costs.

INDUSTRY INSIGHT

FOSTERING THE RIGHT TALENT, WITH THE RIGHT SKILLSETS

The level of success a sector can achieve is based largely on the amount of skill its labour force possesses. Canada’s plant-based food, feed and ingredients sector is no exception, and as the sector becomes more advanced, so do its needs related to talent.

“While many whole-foods-type products do not require more advanced food technology, some product areas, such as plant-meats and dairy-free plant-based products, would benefit from a deeper pool of food tech talent to better improve functionality and performance from some plant materials, and to better understand how some plant materials behave, so that we can devise different methodologies that work to the strengths of a given ingredient, instead of primarily focusing on fractionation,” Blue Heron Creamery Owner Karen McAthy said.

While the sector may encounter challenges in attracting this new talent, particularly related to developing a robust plant-based farm-to-product pipeline, McAthy sees plenty of potential. She said it’s important for companies within the sector to first identify existing gaps, then work with other companies, organizations and even governments to fill them. This may be through strategic recruitment, scholarships, tax incentives or other incentives, as well as focusing on more than just protein products.

“Plant protein is a very important focus, but addressing fibre, and understanding the connection between nutrition and macronutrients is essential,” she said. “Bringing farmers, food scientists/technologists and producers together to identify opportunities for solutions may be complex, but I think necessary, especially toward finding ways to transition that will be lasting and meaningful rather than reactionary and temporary.”



THE OPPORTUNITY FOR CANADA CREATING THE PATH TO \$25 BILLION

Canada is uniquely positioned to take advantage of the growth in plant-based food, feed and ingredients. Building on our foundational strengths, Canada can work to transition from a commodity-based agricultural system, diversifying from bulk commodity trade, to a supplier of ingredients and finished food products. To do so, we must capture the associated value along the value chain from commodity to ingredient, and from ingredient to finished food product. At each step of the chain, there is a significant increase in value, with the largest being from ingredient to finished product.

To reach the end goal, we must first establish our ability to process ingredients at the scale necessary to meet the global demand. At an unprecedented rate, ingredient processing capacity is being built and supply chains are being established as countries race to satisfy demand. Canada must act quickly to establish the infrastructure, expertise and processing innovation to prove we are the preferred country to produce and provide plant-based ingredients. If we do not act quickly to establish critical mass in crop processing and ingredient manufacturing, other jurisdictions will, and Canada will not capture our global share, nor realize the opportunity that is in front of us.

Increasing value-added production in Canada will not only contribute to a stronger and more diversified Canadian economy — creating jobs and benefits to Canada, but it will also help protect us from trade disruptions, improve domestic food security, and provide market stability for Canadian products.

The current size of the Canadian value-added plant-based food and ingredient market, excluding canola processing and wheat milling, ranges between \$2.5 and \$3 billion in annual value comprised of the domestic retail sales of plant-based foods and production of high-value ingredients that are destined for human consumption. The goal of \$25 billion represents a significant increase in activity and value capture for all aspects of the sector. With the first step — scaling up ingredient processing capabilities, while also fully leveraging co-products, and the opportunity presented by the feed market. Scaling up ingredient processing is necessary to establish Canada as a leader in the production of finished goods — the highest point of value capture.

We have already established that plant-based food, feed and ingredients represents a once-in-a-generation economic opportunity for Canada. One that not only represents \$25 billion of annual economic growth, but that will also contribute significantly to Canada's transition to a zero-carbon economy, address national and global food security and nutritional challenges, and provide long-term stable employment opportunities for a range of highly and moderately skilled labour. While success may be measured in dollars, there will be benefits for Canadians, our environment, and for the billions of people from around the world who rely on Canada for nutritious and safe food.



LEARNING FROM INTERNATIONAL SUCCESS

Canada is not the only nation vying to claim a significant portion of the global plant-based food market. Many other jurisdictions are looking to secure investments, attract major food and ingredient brands, create a favourable business climate and support innovation. Some are being much more progressive, aggressive and coordinated in their actions.

There is urgency for Canada to compete for investment, to secure ingredient processing capacity and to lay the foundation for a globally competitive plant-based foods manufacturing sector. Value chains are being built around the globe. Over the next decade, ingredient processing infrastructure will be established to meet the global demand for plant-based food consumption. This capital-intensive infrastructure is immobile, and where it's built will determine the trade flows of commodities. That is why it is important for Canada to act quickly, to secure the capital necessary to build out our ingredient processing capacity and " , move quickly to align our regulations to support innovation.

The primary competitors in this space include the Midwest United States, China, the Netherlands and Singapore, though other countries, such as Israel and Australia, are also making substantial investments. Canada's strength is largely our integrated value chain, along with our strong trade agreements and sustainability standards. These elements set us apart from many of our competitors. However, our competitors' strengths lie in other areas notably capital investment and incentives, lower cost of business, and regulatory innovation are strong incentives for companies to consider doing business elsewhere. Canada does not need to compete on every factor, but we must be competitive in a suite of areas to attract investment. Currently, Canada's regulatory environment is a major barrier to business attraction and growth for both domestic and international companies.

UNITED STATES

The United States is recognized for its more agile regulatory environment for new food products, critical mass of population, mature ingredient manufacturing, and better access to capital. In addition, the large domestic population makes it an attractive market to produce plant-based foods. The United States also has a critical mass with respect soy-based ingredient manufacturing, meaning that companies with a history of operation in the space have the know-how to manufacture and market ingredients.

Canada will need to leverage the diversity of feedstock available relative to the soy-dominant United States. In addition, more ingredient manufacturers and consumer packaged good (CPG) companies are evaluating sustainability indices and calculating the carbon footprint of ingredients. One of Canada's major strengths is our ability to process ingredients and food close to crop production, which reduces transportation costs and associated emissions.



CHINA

Canada has a strong value proposition, including access to markets, high levels of coordination, strong agriculture production base, and more, to support the development of a robust plant-based food and ingredient sector. However, the country struggles to be cost competitive when assessing our cost structure with China across a range of operating costs, including labour, energy and water, and fixed costs, such as site preparation and construction. In addition, the regulatory costs of site selection, preparation and ongoing operations are higher in Canada.

This does not mean we cannot compete against China; however, it means that we will have leverage and monetize our value proposition in markets that value sustainability, food safety, choice and quality. It is not unlike how we have positioned Canada's raw commodities in global markets. We will have to be focused on replicating the success we have had in the commodity sector for plant-based ingredients and foods.

THE NETHERLANDS

The Netherlands is an example of a jurisdiction that has leveraged their existing innovation ecosystems and talent to advance their position in the alternative protein market. They have been able to use innovation and automation to build one of the largest food economies in the world – without access to raw commodities on the scope and scale that Canada enjoys. Today, the Netherlands ranks well above Canada with respect to global food exports, has worked to build a highly innovative ecosystem, and developed a world-class talent pool and talent stream.

Canada can look to jurisdictions like the Netherlands for inspiration and partnership to grow our food processing sector.



COUNTRY SHOWCASE

SINGAPORE

As a global hub for innovation, Singapore has built a vibrant ecosystem featuring global research and development labs for leading Fortune 500 companies, as well as over 150 venture capital funds, incubators and accelerators.

As a nation, they have established a 30 by 30 target with a top line goal of producing 30 per cent of their nutritional needs locally by 2030. In support of this initiative, the Singapore government has made strong policy and regulatory decisions to encourage investment, including the regulatory approval of cellular-based meat. The policy changes, industry support and regulatory modernization has increased overall investment, including a significant amount of foreign direct investment (FDI).

Singapore is leading the drive for innovation by supporting early development of new and novel products and technologies. They help reduce risk companies may face and drive towards strategic outcomes with impressive grant incentives – in some cases up to \$15 million per project.

Singapore holds centralized leadership of a strategic food imperative to apply digital, financial, bio-security and regulatory levers in unison. Food is recognized as its own economic pillar and that which supports the success of others. A priority on food manufacturing policy, technology and supports delivers more than food security.

Singapore is leveraging capabilities in adjacent sectors, such as life sciences and advanced manufacturing, to support the goal of becoming a world leader, and they have developed supports for each component of the food sector operations and value chain – everything from foreign worker passes, to technology challenges and grant calls for white space product development.

Singapore holds a strategically competitive regulatory environment that recognizes and leans to new foods, processes and ingredients. Making space for new opportunities rather than focusing entirely on the interests of more conventional sectors, Singapore has the advantage of attracting the innovators.

Understanding that Singapore's policy objective with these moves were more related to food security versus economic growth, and the focus was on cellular agriculture, it is an illustrative example of how regulatory modernization can drive investment and innovation. Also, as alternative sources of protein emerge, and we experience a convergence of evolution between plant-based, fermentation science and cellular-based meats, those jurisdictions that balance food innovation with a business-focused regulatory system will attract major ingredient and food processing companies.



CANADA'S POSITION

BUILDING ON CANADA'S STRENGTHS

Canada's potential as a leader in the production of plant-based food, feed and ingredients will evolve from our strength in commodity production. This is an opportunity to build on our firm base and capture significant value by converting our raw commodities to high-value ingredients and plant-based foods.

The Ernst and Young report commissioned by Protein Industries Canada in 2020 positions Canada's strengths in five key areas: market access; sustainable production practices; agricultural land base and crop production strength; food safety and quality; and research, talent and agrifood clusters. While each area can help strengthen and lead to new opportunities in the others, they each also represent important opportunities for Canada individually.

AGRICULTURAL LAND AND STRENGTH IN CROP PRODUCTION

Canada is endowed with more than 40 million hectares of arable land, and we are a leading producer and exporter of protein-rich crops, including canola, dry peas, lentils, fava beans, chickpeas, soy, oats and wheat. Not only does our current agricultural production outpace domestic consumption, but we also have the potential to further increase production volume. In addition to the land base, Canada is home to the most innovative producers in the world who employ sustainable farming systems, quickly adopt leading-edge production technologies, and can scale new crops and new varieties quickly.

SUSTAINABLE PRODUCTION AND PROCESSING

Canada boasts some of the most sustainable crop, ingredient and food production in the world. We have proven to be an efficient and sustainable producer of crops through practices, such as diverse crop rotations, zero- and minimum-tillage production, precision agriculture, and the quick adoption of new crop varieties. This, combined with natural attributes, such as a large land base, provides Canada an advantage over many other countries.

The strength of Canada's agrifood sector is interwoven with the health of our environment. The sector relies on the environment to help maintain access to high-quality commodities and healthy workers — while also contributing to the environment's health through increasingly ambitious sustainability goals. Canada's ingredient processors and food manufacturers are also committed to reducing their environmental footprint — be it through reduced water or energy use, carbon-neutral facilities, or improvements to on-farm practices. There is also advantage for companies to process ingredients close to Canada's crop production, including reduced distances from production to consumption, and minimize their waste through the use of co-products for both the feed market and bio-industrial applications. This helps improve sustainability efforts across the agriculture industry and translates to low-carbon footprint ingredients and food products.



RESEARCH, TALENT AND AGRIFOOD CLUSTERS

Canada has advanced research capabilities along the entire value chain — from breeding and production, to ingredient processing and food manufacturing. A key attribute of the research infrastructure is the close relationship of all the players along the value chain — allowing for fast iteration and product development. Throughout Canada, these research clusters are focusing on improving elements like protein content, taste and functionality of commodities used in processing.

Canada also boasts one of the most educated workforces in the world, with 58 per cent of Canadians aged 25 to 64 having graduated from post-secondary institutions. In addition, The Global Skills Strategy allows for international talent to come to Canada and legally work here in as little as two weeks. This means that if select skilled workers aren't already in the Canadian market, federal immigration programs enable them to be identified and brought in very quickly.

FOOD SAFETY AND QUALITY

Canada is a leading jurisdiction in food safety and a supplier of high-quality crops. We enjoy a global reputation for our food safety, largely because of our regulatory environment. The Ernst and Young Report cites this as one of our key competitive advantages — particularly because our food safety policy resembles that of the European Union. This resemblance, according to the report, provides a particular advantage for Canada in the EU market — while still providing benefits in other areas of the world. Considering the priority given to food safety in key export markets for plant-based ingredients and food, Canada's reputation provides a distinct advantage.

While our regulations around food safety are strong and an important part of the Canadian advantage, we must continue our work toward regulatory modernization. While keeping food safety a top priority, we must work with the government to ensure Canada's regulations support innovation and encourage new investment into the sector and the country.

MARKET ACCESS

Canada is a small country. To establish a robust ingredient and food processing industry, we must think globally. Canada has 14 trade agreements, allowing preferential market access to 51 countries, nearly 1.5 billion consumers, and a combined GDP of USD\$49.3 trillion.

Canada also enjoys a strong relationship with other G7 nations, and as such, is in a prime position to achieve a global footprint. Canada is the only G7 nation to have trade agreements with each of the others, including through the Canada-United States-Mexico Agreement, Canada-European Union Comprehensive Trade Agreement, and Trans-Pacific Partnership. We must also consider Canada's strategic position to facilitate trade with the US market — thanks to a closely integrated cross-border logistics network via rail and truck. This allows companies to establish in Canada with easy access to one of the largest markets for plant-based foods.



These trade agreements provide Canada with preferential access to a significant number of global consumers. Keeping this market access and securing new trade opportunities will be of particular importance to meet the rising demand for plant-based foods. Trading value-added products, such as finished food products, can also help mitigate trade risk that comes with the commodity trade. Over the years, Canada has faced multiple trade disruptions of our commodities, though often ingredients of finished products from that commodity are not impacted.

INDUSTRY INSIGHT

STRONGER PARTNERSHIPS FOR A STRONGER ECOSYSTEM

We can go further by working together than we can by working alone. Through collaboration, Canada's plant-based food, feed and ingredients sector can foster new innovation and build the relationships it needs to create a strong feedback loop that will help it meet the needs of consumers around the world.

Additionally, according to Big Mountain Foods Ltd. President Jasmine Byrne, strengthening linkages across the plant-based food value chain can help companies across Canada connect with new partners they may otherwise have been unable to find.

"Creating a linkage and collaboration across the value chain is so valuable because without these connections we might not know a supplier exists. Linking the value chain allows for manufacturers to keep their ingredients sourced in Canada," Byrne said. "Protein Industries Canada has been a significant partner to Big Mountain Foods to scale a disruptive new innovation using Canadian pulses."

These linkages and collaborations have been increasing over the past few years, but more can be done to ensure they continue. Byrne cited increased communication across the sector as the best option of ensuring their occurrence. And while it may take some work to get all companies on board with linking the full value chain, networking and other events can help sway them.

"More communication and collaboration with likeminded organizations [can help overcome such challenges]," Byrne said.



THE ROAD TO \$25 BILLION OUTCOMES AND ACTIONS TO DRIVE CANADA'S PLANT-BASED ECOSYSTEM

The path to becoming a global leader in the processing and production of plant-based foods is complex. First and foremost, it is an emerging sector. The reality is that we are not only working to scale to meet global demand, but we are also working to create an entire sector. Ten years ago, the discussion around plant-based food was niche. Today, it is recognized as mainstream with unparalleled growth potential, but the infrastructure and support that an established industry enjoys is not yet present.

INNOVATE

WHY IT IS IMPORTANT:

Innovation will underpin the growth of the global plant-based food, feed and ingredient sector. Many of the products that will be consumed a decade from now have yet to be conceived and will be built using technologies and intellectual property that has yet to be created. It is critical for us to lead the innovation for the high-protein crops where we lead in global production, such as peas, lentils, chickpeas and canola. When we consider the opportunity to create unique ingredient blends, as well as new uses for starch and co-products, it is even more critical that we focus on homegrown innovation and the creation of intellectual property. By taking a collaborative, value chain approach to innovation and by combining the strengths we have in plant genetics with our innovative producers, ingredient manufacturers, consumer packaged goods companies, and food distribution and retail sectors, we can create unique and differentiated product offerings that have wide consumer appeal, and make use of co-products for new applications, such as bio-industrial products and livestock feed.

CANADA IS A HUB FOR PLANT-BASED FOOD INNOVATION

In today's economy, investment into research, innovation and talent is a global competition, and these investments are targeted at vibrant and highly innovative ecosystems. For Canada to be a global leader in plant-based food, feed and ingredients, we need to be viewed globally as a hub for plant-based innovation that offers a critical mass of research infrastructure, a mix of public and private entities, and a talent pool that will not only deliver on what is needed, but also acts as a magnet to draw in additional talent. For Canada to develop this global reputation, we need a highly focused innovation ecosystem that attracts investment and talent, and creates tighter linkages between public and private research entities.



RECOMMENDED ACTIONS:

- Increase investment into diversified, consumer-focused plant-based foods innovation;
- Increase investment into diversified, plant-based feed and co-product innovation;
- Develop funded international research partnerships to accelerate the pace of innovation;
- Align and link the public research sector to better support ingredient manufacturing and plant-based food production;
- Attract global talent and create opportunities for under-represented groups to participate in Canada's plant-based foods innovation ecosystem;

CANADA'S REGULATORY SYSTEM MUST SIGNAL TO THE WORLD THAT WE WILL ACCELERATE AND ENABLE THE DEVELOPMENT AND COMMERCIALIZATION OF PLANT-BASED FOODS

Many recent reports have stated that Canada's agrifood regulatory system requires modernization to keep up with the pace of innovation. Despite the many calls from industry for reform, Canada's regulatory system continues to suppress innovation — resulting in investments flowing outside of the country. Canada needs to find alignment between federal departments — harmonizing the objectives between regulation and innovation to support the growth of Canada's plant protein sector.

Canada is at the point where catching up to our competition is no longer good enough. Increasingly, countries are using regulatory reform to enhance innovation and incent investment. Canada must take this opportunity to build a regulatory framework for plant-based food, feed and ingredients signaling that we are a jurisdiction that intends to be a global leader in innovation while protecting human, animal and environmental health. This will require a mix of specific regulatory changes and a strong focus on supporting the science needed to advance additional regulatory changes in a timely manner.

RECOMMENDED ACTIONS:

- Adopt international best practices for protein equivalency and content labelling;
- Improve the service standard for novel food approval from 410 days to 100 days in order to be responsive to industry;
- Regulate plant-based foods consistently with other products in respect to mandatory and discretionary fortification with amino acids, vitamins and/or minerals;
- Ensure that the products of gene editing are not subject to regulation where traits fall into current range for the species; and
- Create a Regulatory Centre of Excellence to assist SMEs with regulatory compliance and to conduct research in support of regulatory modernization.



CANADA'S AGRIFOOD SECTOR IS RECOGNIZED AS ONE OF THE WORLD'S MOST SUSTAINABLE SOURCES OF PLANT-BASED FOODS AND INGREDIENTS

Today's consumers not only demand highly sustainable food choices, but they also expect transparency related to how their food was produced and its impact on the environment. Canada is coming from a place of strength in the sustainable production of our crops, while also embracing continual improvement to reduce the environmental footprint of commodities and to continue to decrease the energy required for ingredient and food processing.

Embracing the need to improve is important, but we need to focus on outcomes, not prescriptive solutions. Promoting or advancing any singular practice fails to recognize the complexity of agricultural systems and the interplay with the environment. We also need to ensure that we have the systems in place to measure and substantiate our environmental footprint throughout the entire value chain. As consumer preferences change, the agrifood system will come under increased pressure to reduce GHG emissions and prove sustainability claims. We must embrace a metric-driven system that feeds into global measures of sustainability and that recognizes Canada's agrifood sector as a solution to climate change.

RECOMMENDED ACTIONS:

- Invest in technologies to reduce the environmental footprint of Canadian crop production, and ingredient and food manufacturing;
- Develop traceability systems that allow for tracking and data capture throughout the value chain, allowing for environmental and carbon footprint analysis; and
- Advance collaboration across federal agencies and departments, such as Sustainable Development Technology Canada (SDTC), to increase clean-tech innovation for food production and ingredient and food processing.

CANADA IS A GLOBAL LEADER IN THE CONVERSION OF RESEARCH AND INNOVATION INTO COMMERCIALY SUCCESSFUL PRODUCTS AND SERVICES

Canada has often been criticized for a poor track record in the conversion of research into commercially viable products and services. As the Institute for Research on Public Policy has stated, innovation policy in Canada "is overly focused on the generation of knowledge, technology and innovation, and it does not directly address the issues of business readiness and the market's ability to absorb innovations."^{vii} As an ecosystem, we must ensure our investments into research lead to successful and commercially viable innovation, and that our systems support technological innovation and strengthen the linkage to commercialization.



RECOMMENDED ACTIONS:

- Develop and support initiatives that build entrepreneurs with the business and financial acumen to scale commercially successful businesses;
- Work with post-secondary institutions to identify programming and areas of opportunity specific to Indigenous people with the goal of increasing employment in Canada's agrifood sector;
- Pursue best-practice IP models within post-secondary institutions;
- Work with Canada's university and college system to create micro-credential and other programming to meet the needs of a quickly growing sector, with a focus on upskilling and re-skilling from declining industries; and
- Support collaboration between departments of post-secondary institutions to create linkages in research and areas of study, including human health, environment, business and bio-technology.

INDUSTRY INSIGHT

COLLABORATING TO FOSTER INNOVATION AND SECTOR EXPANSION

Strong collaboration strengthens the links we're building across our sector. These links are critical to making Canada a global leader as a supplier of plant-based food, feed and ingredients.

"One organization can't do it all," Avena Foods Limited CEO Gord Flaten said. "[Farmers] need input [from] suppliers, agronomists and business advisors. They need processing companies to sell to and the investors and entrepreneurs who create those companies. As processors, we need educational institutions to train potential employees and research organizations to help us overcome technical challenges. Governments play a key role by providing funding for risky but high-potential R&D projects, regulatory guidelines and assistance in export markets. Customers for ingredients are also a key link in the chain. We all need to work together to figure out what consumers want and how best to produce those products."

While conflicting schedules and priorities can sometimes make it challenging for companies to connect, Flaten believes industry leaders can encourage others to overcome the difficulty by facilitating networking and participating in collaborative projects.

"With Protein Industries Canada and other industry leaders encouraging brainstorming, providing some of the funding, and being there to facilitate projects with expert staff, we can overcome the challenges and complete projects that will benefit the whole value chain."



SCALE

WHY IT IS IMPORTANT:

The value of the global opportunity for plant-based foods will be measured in the hundreds of billions over the coming decades, and the volume of crop required to satisfy that demand could exceed 100 million metric tonnes. Most of this demand for ingredients will be met by processing facilities that have yet to be constructed, and the demand for consumer products will be met through new products that need to achieve enough scale to be cost competitive with current meat-based products. The rate-limiting step for Canada to become a dominant player in the global plant-based foods market is ingredient processing. We need to achieve critical mass to support both domestic food processing and to become a globally relevant ingredient supplier. Over the next decade, the ingredient processing infrastructure will be established to meet the global demand for plant-based food consumption. This capital-intensive processing infrastructure is immobile, and their locations will determine the trade flows of commodities.

CANADA'S PLANT-BASED FOODS SECTOR RAISES THE CAPITAL NEEDED TO SUPPORT TRAILBLAZING COMPANIES TO ACHIEVE AN ADDITIONAL \$25 B IN ANNUAL SALES

Canada's plant-based ingredient and food processing sector will need billions of dollars in capital infrastructure investment over the next decade to reach a goal of \$25 billion in annual sales by 2035. This will require a broad suite of capital sources from early-stage investment right through to long-term patient capital. It will require a mix of equity and debt financing, creative public policy, and a coordinated effort between the capital community and public sector lending institutions.

RECOMMENDED ACTIONS:

- Establish a pool of capital focused on plant-based ingredients and foods for pre- to early-growth revenues stage companies looking to scale;
- Develop and recommend a suite of policy options to manage risk for potential investors;
- Evaluate, develop and launch a program(s) with crown lending agencies to incentivize investment into the plant-based food, feed and ingredient sector;
- Create awareness within the capital community on the plant-based opportunity; and
- Foster greater inclusivity of under-represented groups in capital markets for plant-based foods, ingredients and feed.



CANADA BUILDS, EXPANDS AND RETAINS DOMESTIC COMPANIES

To meet the ambitious goal of \$25 billion in sales by 2035, Canada will require a large and diverse ecosystem of ingredient processors and food manufacturers. Through support for research and innovation and encouraging collaboration throughout and along the value chain, we are laying the foundation on which to build this future ecosystem. Over the next decade, we need to support new innovative start-ups, our SME community and our large anchor firms to continue to grow and scale. This will take a concerted effort to align innovation with business acumen and to ensure that we are developing the talent and skills with which to support future growth.

RECOMMENDED ACTIONS:

- Advance industry-led ingredient food-tech incubation and/or acceleration initiatives;
- Create toll processing, pilot plants and co-packing facilities;
- Create programs/opportunities for companies to strengthen business acumen to better leverage capital markets and to commercialize products; and
- Develop and deploy programming related to reskilling, accreditation and credential recognition for underemployed, under-represented and new Canadians in areas related to digital skills and food and ingredient manufacturing.

OUR NATIONAL PLANT PROTEIN ECOSYSTEM ATTRACTS FOREIGN COMPANIES TO ESTABLISH OPERATIONS IN CANADA

Achieving \$25 billion in annual sales will require foreign direct investment (FDI) into Canada's plant-based food, feed and ingredient ecosystem. We have many successes across the ingredient processing space where foreign companies have invested in Canada to take advantage of our value proposition, including the proximity to raw commodities, and we need to continue to replicate these successes as we build out the ingredient processing sector. This will require collaboration across all levels of government, an acute understanding of our competitiveness versus other jurisdictions, the development of a suite of meaningful incentives, and the marketing of Canada as the place for investment in plant-based ingredient and food manufacturing.

RECOMMENDED ACTIONS:

- Create an investor-focused, national strategy to attract FDI to Canada's plant-protein ecosystem and execute the strategy collaboratively with all levels of government;
- Create a dedicated and centralized, investor-oriented, plant-based FDI team with resources both domestically and in key international markets;
- Develop and recommend a suite of capital expenditure incentives;
- Leverage a network of foreign partners to promote Canada's plant-based foods sector as a target for FDI.



CANADA OFFERS A COMPETITIVE BUSINESS ENVIRONMENT FOR THE GREENFIELD CONSTRUCTION OF NEW PROCESSING FACILITIES

Infrastructure investment via capital inflows, the growth of domestic players, and foreign direct investment will happen fastest in jurisdictions with a highly competitive business environment – those who offer business-focused solutions, expedite the approval of facilities, and offer competitive, well-serviced options with respect to the utilities required for value-added processing. This is an area where Canada can improve its offering through collaboration and coordination across all three levels of government.

RECOMMENDED ACTIONS:

- Work with Canada's Infrastructure Bank to create large-scale utility-serviced processing parks across Western Canada;
- Encourage coordination and parity among provincial jurisdictions with respect to capital expenditure incentives;
- Create an understanding of the infrastructure/transportation needs to support the growth of the sector as it evolves; and
- Encourage coordination and parity among municipal and provincial jurisdiction to create shovel-ready sites.

INDUSTRY INSIGHT

STRATEGIC INVESTMENT LEADS TO STRATEGIC GROWTH

Strategic sources of investment capital are required to take Canada's plant-based food, feed and ingredients sector to the next level.

"You need to have the right money, both patient and smart," T Base 4 Investments CFO Blair Knippel said. "While there are numerous Canadian opportunities in the sector, raising project capital in this space is actually a real challenge because these projects generally do not fit into a Canadian investor's overall risk-adjusted investment thesis. Therefore, our problem remains that if somebody doesn't step up and find the 'right' capital to fund these opportunities, our goal of long-term GDP and employment growth will never accrue within our borders."

As the capital community's understanding of an opportunity grows, so does their desire to invest. Capital communities are what grew world-renowned ecosystems in the U.S., Europe and Asia. Two important questions remain, however: which companies will be able to attract the right capital, and where will their physical operations be located? In order to ensure Canadian companies and innovators remain a long-term component of Canada's plant-based food, feed and ingredients sector, Knippel believes we need to raise awareness of the opportunities available here while also proving Canada has the necessary type of capital and risk tolerance to create new opportunities for businesses, employees and investors.



PROSPER

WHY IT IS IMPORTANT:

Canada has had a long history of being a commodity provider — a trusted supplier, but a supplier, of raw commodities, not high-value ingredients and food products. The trends around plant-based foods represent an opportunity for Canada to de-commoditize, to break the current cycle, and to reposition ourselves as a global leader in plant-based ingredients and consumer packaged goods. This represents an opportunity to capture billions of dollars' worth of value — value that, if we don't commercialize, will be captured by competing jurisdictions around the world. We have to be focused on selling the highest-value products to ensure that we are generating wealth for reinvestment back into the sector.

CANADA'S BRAND IS GLOBALLY RECOGNIZED AND RESPECTED

Canada is endowed with a large land base on which to build a plant-based food, feed and ingredient sector, which also means that as we grow the sector, we will need to grow our export potential for high-value ingredients and plant-based foods. We also have the great fortune of a strong value proposition with respect to our global brand, which is anchored in quality, safety, nutrition and sustainability. Extracting as much value as we can from our ingredients and food products will require us to better define and promote our unique value proposition, and for us to target markets that value those brand attributes.

RECOMMENDED ACTIONS:

- Define the Canadian plant-protein brand attributes and unique value proposition;
- Market Canada's value proposition and diverse product offerings as unique among global players;
- Support companies in the development of an internationally relevant and competitive brand(s) in key markets; and
- Work with partners to support the marketing and promotion of Canadian products and companies in key markets.

CANADA'S PLANT-BASED FOOD SECTOR DELIVERS THE WORLD'S MOST DIVERSE, HEALTH-CONSCIOUS, APPETIZING AND CONSUMER-FOCUSED PRODUCTS

Consumer preferences are always changing, and the pace of change is increasing. The rate of change also appears to be more pronounced in plant-based foods — as consumers are still defining the benefits they seek, and new product categories are always emerging. Jurisdictions that can innovate quickly and can deliver diverse, consumer-centric innovation will be rewarded.

RECOMMENDED ACTIONS:

- Identify consumer wants and values in key markets and integrate those findings into ingredient and food production;
- Increase consumer awareness of the benefits of plant-based foods;



- Identify and actively pursue white space market opportunities; and
- Adopt advanced manufacturing technology and data practices to maximize efficiencies, competitiveness and sustainability.

CANADIAN COMPANIES TAKE ADVANTAGE OF GLOBAL OPPORTUNITIES

We must support Canadian companies to think and act globally – starting at the product concept phase. As a nation driving toward an incremental \$25 billion in annual sales, we will only be successful if we are developing globally relevant brands for both high-value ingredients and consumer packaged goods. This will require the convergence of innovation and business acumen, deep understanding of global markets, and the evolution of our trade agreements to ensure that they support the free flow of products derived from our raw commodities.

RECOMMENDED ACTIONS:

- Develop programs to offer mentorship and build business acumen of Canadian plant-based entrepreneurs that consider product development, access to capital and how to compete globally;
- Position Canada as a global innovation hub and product test market with an abundance of unique raw material, research infrastructure, a diverse population and access to major global markets;
- Ensure that all international trade-related agreements and negotiated market access evolve at the speed of the sector;
- Advocate with World Customs Organization for HS codes that better capture the diversity of plant-based products to facilitate access to international markets and measurement of trade flows.

CANADIAN COMPANIES BENEFIT FROM A HIGHLY INTEGRATED AND NIMBLE SUPPLY CHAIN

A major advantage for Canada as we build out the plant-based food, feed and ingredient sector is our collaborative and cooperative value chain. Canada's agrifood sector is well aligned, from the plant breeding community and producers, to ingredient processors and food manufacturers. This alignment allows us to innovate more quickly, adopt technologies faster, and be more responsive to changing consumer needs. We need to strengthen this approach and leverage the fact that although we are small, we can use that to our advantage to be responsive and nimble.

RECOMMENDED ACTIONS:

- Create opportunities where players can collide, intersect and explore collaboration;
- Incentivize value-chain driven innovation and product development; and
- Support a customer-centric approach to innovation, leading to increased value from crop to ingredient, and ingredient to food product.



INDUSTRY INSIGHT

CANADIAN PRODUCTS, GLOBAL RECOGNITION

If Canada wants to become a leader in plant-based food, feed and ingredients, it needs to make a name for itself on the global stage; it needs to create a recognizable brand.

“There are a multitude of reasons why it’s important for Canada’s plant-based food sector to build a globally recognizable brand,” New School Foods Founder Chris Bryson said. These reasons primarily come down to global population growth, a move toward more sustainable food production, and increasing consumer demand for healthier food options — all of which provide ample opportunity for Canada to pull from when developing its brand narrative.

Despite these opportunities, Bryson said establishing a global brand won’t necessarily be easy. The sector will have to come together to do so, including determining such factors as, where advertising money will come from, what the brand will look like, and exact messaging.

That said, he believes it can be successful if the sector focuses on showing consumers why plant-based products are a benefit to individuals.

“When it comes down to it, people will act in a self-interested manner,” Bryson said. “So, if we’re marketing a Canadian brand, it’s important to convey that plant-based foods are better for the individual first, and society and the planet second.”

A REGULATORY SYSTEM DESIGNED FOR SUCCESS

Regulations play a significant role in a sector’s ability to be innovative and out-perform its competition. A modern regulatory environment will ensure the plant-based food, feed and ingredients sector’s success — while preserving Canada’s strong reputation for food safety.

“For companies to invest in Canada, including my own, the rules need to be clear in advance,” Synthesis Agri-Food Network Client Director Rob Hannam said. “Change does happen, but it needs to be, sort of, predictable and clear, so we can make a business choice as to, ‘should we locate here, or should we locate there?’”

Hannam explained that Canada’s regulations related to plant-based food, feed and ingredients are behind that of our competition largely due to the speed at which the modernization occurs. He believes there’s opportunity to quicken it.

“I don’t see a lot of risks, I see opportunities,” he said. “Here we are on the cusp of all these great developments — and I guess one that I’m thinking of is new plant breeding technologies ... they’re approved in the U.S., they’re approved in other countries ... and we’re falling further behind the competitors that are export competitors, and we’re out of step with some of the markets and our customers, as well.”



NEXT STEPS IN THE JOURNEY

This Roadmap is not intended to provide all the answers. It is meant to start the conversation and provide the framework to bring the sector together. Our hope is that it will help members of the ecosystem galvanize around a common goal and encourage them to mobilize around outcomes and actions most pertinent to their own goals and mandates.

We are near the start of our journey, and there is still along way to go. While this is an important first step, it is just that. This will be a living document that will evolve as a sector does.

To help guide next steps, and to bring accountability and transparency to the process, three short-term priorities have been identified:

- 1) **Advisory Committee:** An advisory committee of industry leaders from across the ecosystem will be formed to help guide the implementation of the Roadmap, provide insights and support the larger work of the ecosystem. Members will come from across Canada and will represent ingredient processors, food manufacturers, academic institutions, NGOs and producers.
- 2) **Setting of benchmarks and targets:** While the goal of \$25 billion in annual sales is the ultimate destination, more work needs to be done to determine benchmarks and targets to support implementation and progress. This work will be guided by the advisory group with the help of experts from across the ecosystem and will be released within 90 days. The targets will become what progress is measured against.
- 3) **Implementation of Actions:** In order for the Roadmap to be successful, there must be a committed and focused effort to implement the recommended actions and accountability to the targets to demonstrate progress. Working through the Advisory Committee, further opportunities to engage stakeholders to advance implementation will be created. These engagements will focus on creating specific plans around each recommended action, and assigning ownership. In collaboration with and through the efforts of stakeholders, the actions will be further refined and implemented.

TRACKING SUCCESS

The Roadmap is designed to be a 14-year journey for Canada's plant-based food, feed and ingredient ecosystem. Undoubtedly, the sector – and our role within society and the larger agrifood industry – will look quite different by 2035. To ensure we are on the right track, and evolving as necessary, it is important that significant milestones and success measures are identified and adhered to. The initial work around benchmarks and targets will include identifying the appropriate indicators to measure progress, as well as identifying both short-term and long-term targets. This work will be completed by April 1, 2022. Updates to the progress of the Roadmap will be provided at minimum annually.



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THE ROAD TO \$25 BILLION IS A PROJECT LED BY:



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ⁱ<https://www.un.org/en/sections/issues-depth/food/index.html>

ⁱⁱ<https://www.un.org/development/desa/en/news/population/world-population-prospects-2017.html>

ⁱⁱⁱ Canadian Agri-Food Policy Institute; Big Solutions Forum (<https://www.youtube.com/watch?v=GjfgDDet7-g>)

^{iv}<https://www.ipcc.ch/srccl/>

^v<https://www.ipcc.ch/srccl/chapter/chapter-5/>

^{vi}<https://foodsecurecanada.org/>

^{vii}<https://irpp.org/research-studies/costly-gap-neglect-demand-side-canadian-innovation-policy/>