



Towards a National Strategy for Agri-Food Research and Innovation in Canada

MAY 4, 2022

**Steering Committee for the Call to Create a
National Strategy for Agri-Food Research and
Innovation**

About the Steering Committee

In November, the Agri-Food Innovation Council (AIC) issued a call for Canada to develop a National Strategy for Agri-Food Research and Innovation. Since then, dozens of stakeholders from across the agri-food sector have echoed the call.

You can find the growing list of supporters at www.aic.ca or by clicking [here](#).

Subsequently, the Steering Committee for the Call to Create a National Strategy for Agri-Food Research and Innovation (Steering Committee) was formed. Members include leaders from industry, provincial governments, and academia representing the diverse landscape of the agri-food research and innovation ecosystem.

The Steering Committee will guide the advocacy efforts to establish a national strategy but will not advocate for the content of the strategy. We believe the content of the strategy should be determined through a broad and open consultation process.

Steering Committee Members:

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Opportunities, Challenges, and the Future of the Agri-Food Sector

For the sector to fully realize its potential while overcoming significant environmental and productivity challenges, advancements in research and the widespread adoption of innovations is required. We should not take for granted that research and innovation in the agri-food sector will occur – active efforts must be made to support the entire agri-food research and innovation ecosystem at each point along the innovation process.

Feeding a Growing Global Population

The world's population is expected to reach nine billion people by 2050. To meet the future food, feed, fiber, and fuel needs of a growing population a significant increase in the production of all major crops and livestock is needed. Canada is an essential supplier of food to the world. To ensure global food security into the future, the Canadian agri-food sector must continue to enable sustainable and resilient production and improve productivity.

Rising income levels around the world is increasing demand for safe, high quality, and nutritious agri-food products. Shifts in consumer demand is creating new opportunities that Canada is well positioned to capitalize upon.

While the sector currently enjoys a competitive advantage that will enable it to make the most of these global demand drivers, competition from emerging agriculture and agri-food export countries is putting further pressure on the sector to improve productivity and product offerings. As competitors improve their processes and technological capabilities, Canada must accelerate productivity improvements to maintain our competitive advantage.

Maintaining and Growing Canada's Competitive Advantage

The Advisory Council on Economic Growth (Barton Report) identified the agri-food sector as a key sector for the future of the Canadian economy due to its high export, growth, and innovation potential and favourable domestic and global conditions.

The agri-food sector is one of the most important sectors to the Canadian economy, representing 7.4 per cent of total GDP. Canada is the fifth largest exporter of agri-food products in the world, generating nearly \$74 billion in exports in 2020. The sector employs approximately 2.1 million people making it is responsible for one in nine jobs across the country.

Canada currently enjoys a competitive advantage in agri-food due to large endowments of arable land and water resources, enviable access to international markets, a world-class education system, an innovative and competitive corporate landscape, and a long history as a global supplier of safe, high-quality, and nutritious agri-food products. As a leading exporter Canada is well positioned to seize the global opportunities in the production and processing of agri-foods.

However, the sector is being undermined by challenges that are impeding productivity and growth. Chronic labour and skills shortages impose constraints on production and processing capacity. Ongoing transportation and supply chain issues are hindering the efficient movement of goods to market. Lack of access to reliable, high-speed broadband prevents the adoption of technological innovations. Trade disputes and a less secure global trade environment increases risk for agri-food exporters.

The sector also faces perpetual challenges that contribute to a unique and risky, operating environment. Events outside the control of producers can have significant impacts on production such as unfavourable weather, drought, or natural disasters. Disease, pests, and invasive species can harm livestock and reduce yields.

Understandably, the government's predominant policy focus has been to smooth out the inherent volatility and risk associated with the agri-food sector. While stability must continue to be an essential policy objective, especially in the context of climate change, more attention needs to be paid to productivity and production growth. Support to the research and innovation ecosystem, specifically for adoption, is the key to unlocking productivity gains and production growth.

Realizing Sustainable Food Systems

The agri-food sector is a committed and vital partner in the fight against climate change. While the sector contributes to Canada's GHG emissions it also helps to slow climate change by sequestering carbon on agricultural lands. The sector continuously strives to meet and exceed environmental

stewardship expectations to ensure our lands, waters, soils, and biodiversity can thrive for generations to come.

The agri-food sector has also keenly felt the impacts of the climate crisis. Unpredictable and extreme weather events, the loss of biodiversity, environmental and soil degradation, erosion, and other consequences of climate change are threatening production, causing greater losses, and increasing risk. Reducing GHG emissions, adapting to a changing environment, and realizing a more sustainable food system are key objectives for the sector.

Due to the efforts of the sector Canada is already a leader in sustainably produced agri-food products. Through the adoption of innovative practices and technologies, over the last two decades Canadian producers have doubled the value of production while stabilizing GHG emissions. We must continue to achieve these two goals.

As the sector further enhances sustainability, it is paramount that we do not lose sight of productivity. As a major supplier of the world's food, Canada must continue to meet the demands of a growing global population. The human consequences for not sufficiently expanding food production could be dire. Rising food prices and scarcity can cause malnutrition, famine, civil unrest, and war. Canada has an important role to play in ensuring global food security now and into the future.

Reducing GHG emissions, adapting to climate change, and enhancing environmental protection while simultaneously increasing production will only be achieved through impactful research and the widespread adoption of innovations.

Ensuring Everyone has Access to Safe, High-Quality, Nutritious, and Affordable Food

Food insecurity, malnutrition and famine continues to plague ten per cent of the global population that lives in extreme poverty and struggles to meet daily nutritional and caloric requirements.

In Canada, food poverty and lack of access to enough nutritious and affordable food is a persistent and growing problem. This is especially acute in the North and in remote and Indigenous communities. In addition, there continues to be limited access to culturally appropriate foods for some communities.

Affordability is garnering renewed attention due to escalating global food prices. Rising input costs, disruptions to established supply chains, sudden breaks in production due to COVID-19, war or

environmental disaster, and trade instability is putting pressure on prices. These pressures are likely to persist.

Research and innovation will continue to be essential for producing food that is safe, high-quality, and of the upmost nutritional value. Productivity enhancements stemming from research and innovation is required to maintain food affordability in the face of growing demand and heightened uncertainty.

Agri-Food Research and Innovation in Canada

Investment in Agri-Food Research and Innovation is Declining

Canada has materially benefited from agri-food research and innovation. The most well-known example is canola. In the early 1970s, through cross-sectoral collaboration, Canadian scientists developed a variety of canola that could serve new markets. Today, Canada is the world's largest producer and exporter of canola, representing \$13.7 billion in exports in 2021.

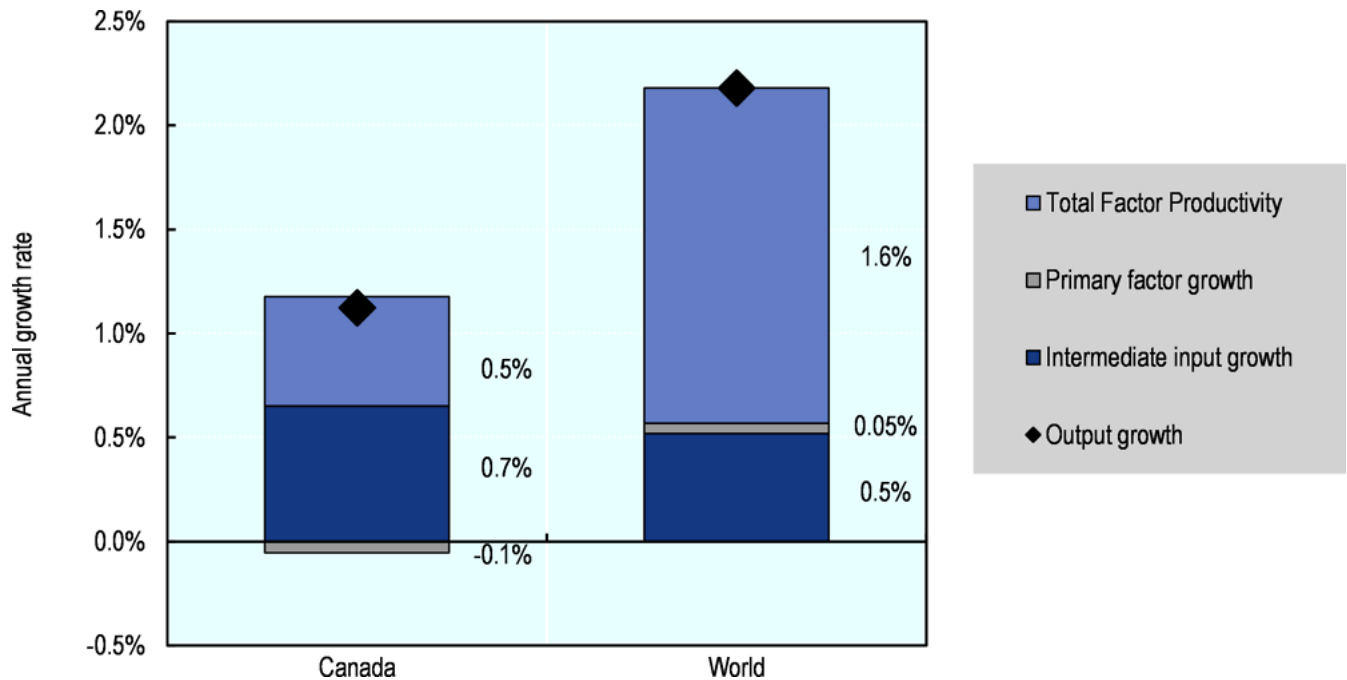
As canola demonstrates, investments in agri-food research and innovation generate a significant return on investment. The benefit-cost ratios for research and development in agriculture are estimated to range from 10:1 to 20:1ⁱ.

The public sector is the largest source of funding for agri-food research and innovation in Canada. Check-offs for certain industries and commodity groups also provide dedicated funding for agri-food research and innovation but that funding fluctuates based on yields.

However, public and private sector expenditures on agri-food research and development have gradually declined over the past decade. Expenditures on R&D as a percentage of sales has fallen by 24 per cent since 2008 and lags behind other OECD countries (the United States and France devote 0.6 per cent of sales to R&D while Canada spends just 0.2 per cent)ⁱⁱ.

Declining investment in R&D over the last two decades has been mirrored by a slowdown in productivity growth compared to our competitors. As the chart below for the OECD illustrates, Canada's output growth between the period of 2007 and 2016 was roughly half that of the rest of the world. If Canada is to maintain and grow our competitive advantage in the production and processing of agri-foods, we must reverse this trend. The key to unlocking productivity growth is through research and the widespread adoption of innovations.

Graph 1: Canada: Composition of agricultural output growth, 2007-16



Source: OECD (2021), *Agricultural Policy Monitoring and Evaluation 2021: Addressing the Challenges Facing Food Systems*, OECD Publishing, Paris, <https://doi.org/10.1787/2d810e01-en>.

To improve productivity and realize sustainable and secure food systems there must be renewed investment in primary research, knowledge transfer, demonstration, commercialization, and adoption of new technologies or processes. A thriving agri-food research and innovation ecosystem is essential for ensuring Canada’s place as a trusted supplier of safe, high-quality, nutritious, affordable, and sustainably produced agri-food.

Barriers to Research and Innovation

The sector faces substantial barriers and unique considerations when it comes to investing in research and innovation.

Maintaining existing production and processing machinery and equipment is already capital intensive, adopting new technologies and innovative processes can be prohibitively expensive. Large upfront capital requirements and a risky operating environment makes it difficult to enter the sector and scale-up. Long timelines to see a return on investment makes attracting investment more difficult.

Agri-businesses and manufacturers are increasingly facing liquidity issues, while research-oriented companies have seen a drop in growth and capital. Meanwhile, food tech and other high-growth companies have cut non-essential expenditures to cope with a tight working capital environment.

Chronic labour shortages and skills reduces capacity to invest in research and innovation. Moreover, the labour gap is expected to grow due to issues such as an aging and retiring workforce and significant workforce changes driven by COVID-19 which have led to workers leaving the sector as they reassess their work-life balance.

High schools and post-secondary education institutions are key players in the development of a mindset and the capacity for Canada to be a global agri-food systems leader. Federal support for agri-food innovation pathways, include capacity at the post-secondary and research institute level, can help develop the talent need for Canada to be the go-to place for agri-food investment.

Special attention needs to be paid to knowledge transfer and demonstration as most producers rely on their personal experiences or the experiences of their network when making determinations about implementing innovations. Demonstration can be difficult and expensive, and there is a limited pre-competitive space for agri-food innovations.

Infrastructure limitations, such as access to high-speed broadband or affordable renewable energy, further complicates adoption of innovations. A complex regulatory environment and some public acceptance issues has resulted in Canadian innovations being commercialized or adopted abroad rather than at home.

Given the decline in research and development investment, Canada's agri-food research and innovation ecosystem would benefit greatly from enhanced government attention and support so that Canada is viewed as highly supportive of those investments.

Agri-Food Research and Innovation Policy

Agri-Food Research and Innovation is Central to Policy Frameworks

The government is a committed partner to the agri-food sector and Canadian research and innovation. Objectives for the agri-food sector have been an important component of the government's main economic development and environmental policy frameworks. Research and innovation has been an central to policy frameworks for the sector.

Example: Major Policy Frameworks Prioritizing Agri-Food Research and Innovation

- **United Nation's Sustainable Development Goals – Goal 2** is to end hunger, achieve food security and improved nutrition, and promote sustainable agriculture. To achieve this objective, the United Nation recognizes that “much more effort and innovation will be urgently needed in order to sustainably increase agricultural production, improve the global supply chain, decrease food losses and waste, and ensure that all who are suffering from hunger and malnutrition have access to nutritious food.”
- **2030 Emissions Reduction Plan: Clean Air, Strong Economy**, set out ambitious targets for the agri-food sector. The plan states that “the path to net-zero emissions requires the development and adoption of clean technology solutions that will reduce emissions while maintaining productivity and competitiveness”.
- **Agri-Food Economic Strategy Table** identified “increasing innovation and seizing value-added opportunities” and “adopting technology and advancing digitization” as two key priorities for the sector to increase capacity and boost productivity. The Strategy Table set a target for Canada to increase its food industry capital expenditures per dollar of sales by 50 per cent and to double private-sector R&D expenditures by 2025.
- **Canadian Agricultural Partnership (CAP)** programs focus on three key areas including supporting “innovative and sustainable growth in the sector”. Funding is intended to enhance “the competitiveness of the sector through research, science and innovation, and adoption of innovative products and practices, with an emphasis on sustainable and clean growth”.

- **The Guelph Statement** set out priorities and focus areas for the Next Policy Framework (NPF) including “continued and targeted investments in science, research and innovation to address key challenges and opportunities”.

While agri-food research and innovation is acknowledged as a vital component of the government’s plans for the sector, the economy, and the environment, there is not an overarching vision for the agri-food research and innovation ecosystem. In addition to the federal government’s plans, the provinces and territories as well as some commodity groups have developed their own policies, programs, and visions for the agri-food sector and the research and innovation ecosystem.

Given the prominence of agri-food research and innovation in these plans, we believe there is a need to ensure the plans are working together towards strategic objectives in a way that is collaborative, efficient, and ultimately effective. Robust consultations co-led with industry, and in close collaboration with the provinces and academia, is needed to maximize impact and achieve policy objectives. Previous strategic planning exercises have not always been conducted with industry at the table.

Towards a National Strategy for Agri-Food Research and Innovation

A National Strategy is the Right Policy Tool

We believe that a national strategy for agri-food research and innovation is the missing pillar in the government's plans for the sector and the key to realizing the goals of the Barton report. To achieve sustainability, productivity and production growth, and global food security, strategic investments in research, innovation and adoption are needed.

To maximize value, we should ensure agri-food research and innovation policies are coordinated, strategic, and focused on realizing market and societal impacts. All points along the innovation process, from primary research to adoption, should be reviewed to ensure alignment with priorities and to address capacity gaps. A National Strategy is the right policy tool to help address these issues.

Example: Pan-Canadian Mining Research and Innovation Strategy

Federal, provincial, and territorial Mines Ministers met in 2007 and endorsed the establishment of the Canadian Mining Innovation Council (CMIC). CMIC Board of Directors included representatives from industry, academia and government and a secretariat supported by Natural Resources Canada and the Canadian Institute for Mining, Metallurgy and Petroleum.

CMIC was asked to develop the Pan-Canadian Mining Research and Innovation Strategy which was released in 2008. Seven regional workshops were held involving leaders from the private, public, and academic sector. Participants were asked about their views on economic, social, and environmental drivers that will shape the future of mining research and innovation as well as to identify the key challenges and opportunities for the sector. Representatives from across the sector participated including the exploration, extraction, processing, mine remediation and closure, and supplier industries.

CMIC developed a clear vision and mission for the Pan-Canadian Mining Research and Innovation Strategy including identifying five priority areas for action. For each priority area CMIC established strategic goals and expected results as well as a five-

Benefits of a National Strategy:

- 1. A National Strategy offers the opportunity for the federal government to provide national leadership** in coordination with the provinces and territories to institute a whole of government approach to identify and address challenges, barriers, and opportunities in agri-food research and innovation.
- 2. Limited government resources can be coordinated and streamlined across departments and jurisdictions.** Like the Pan-Canadian Mining Research and Innovation Strategy a Secretariat could be attached to the National Strategy to help facilitate these efforts and channel resources. This will help improve collaboration amongst participants within the agri-food research and innovation ecosystem as well as the various government departments interested in the agri-food sector and/or research and innovation at different levels of government. It can also limit duplication and enhance the efficiency of government programs and spending.
- 3. A National Strategy provides an opportunity and venue for convening a diverse array of stakeholders to discuss a wide range of issues** facing the agri-food sector and the research and innovation ecosystem. Consultation participants can propose clear and unifying goals and identify shared priorities and common challenges. Together, participants can co-create the strategic direction for the agri-food research and innovation ecosystem. It can also provide a venue for knowledge sharing, the dissemination of best practices and networking.
- 4. A National Strategy can be action oriented.** Action plans for meeting agreed upon objectives can be created, as well as frameworks for measuring progress.

A successful national strategy can help ensure the sector's operating environments foster healthy competition and drive innovation. It can increase private sector investment in the sector and research and innovation which lags behind our competitors. It can address chronic labour and skills shortages, improve the ecosystem's innovation capacity, and attract talent to the sector. A national strategy can look at ways to leverage the collection of on-farm data to benefit the entire sector and enhance communication along the supply chain. It can also be used to drive capital towards the agri-food sector, identify areas for regulatory modernization and enhance Canada's role internationally on issues important to the sector.

Next Steps

To reflect the needs of the entire innovation ecosystem and the broader objectives of the government, the National Strategy should be co-led between the federal government and industry, in close collaboration with the provinces and territories, academia and others.

The content of the National Strategy should be driven by robust consultations. Consultations should bring together diverse stakeholders from across the research and innovation ecosystem including producer groups, manufacturers and processors, distributors, suppliers, investors, researchers, and all levels of government.

The National Strategy should:

- provide strategic direction for the entire agri-food research and innovation ecosystem,
- set clear objectives with concrete timelines,
- target and streamline efforts to achieve stated objectives, and
- enable increased collaboration and coordination across industries and jurisdictions, and between academia, government, and the private sector.

We believe the time is now to come together and co-create the priorities for the next wave of agri-food research and innovation. We recognize that we are operating in a time of fiscal restraint. To ensure limited resources are optimized, it is crucial efforts to support agri-food research and innovation are coordinated and non-duplicative with a focus achieving tangible results.

AAFC is currently consulting on the NPF which will set out federal, provincial, and territorial investments in the agriculture and agri-food sector for the next five years. A national strategy for research and innovation should be at the core of the NPF.

Canada is one of the very few countries in the world that can achieve both production intensity and environmental sustainability while being a reliable and trusted supplier of agri-food products to a world that needs food. To achieve a sustainable, secure, resilient, and productive agri-food sector, we must capitalize on our strong innovation potential.

ⁱ *An overview of the Canadian Agricultural Innovation System*. (n.d.). Retrieved May 4, 2022, from <https://www.aic.ca/wp-content/uploads/2021/04/AIC-An-Overview-of-the-Canadian-Agricultural-Innovation-System-2017.pdf>

ⁱⁱ Sector, I. (2018, September 28). *Report of Canada's economic strategy tables: Agri-food*. Economic Strategy Tables. Retrieved May 3, 2022, from <https://www.ic.gc.ca/eic/site/098.nsf/eng/00022.html>