Agri-food Innovation Council

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Conseil de l'innovation agroalimentaire

Brief to the House of Commons Standing Committee on Agriculture and Agri-Food

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About AIC

Founded in 1920, the Agri-Food Innovation Council (AIC) is a unifying voice for cross-sectoral research and innovation in Canada. AIC advocates on behalf of more than 45 Canadian organizations from across the agri-food system.

For over a century, AIC has responded to the needs of its members in service of the agri-food community, playing a central role as a source of credible information and comment for the Canadian agriculture and agri-food sector.

AIC is one of Canada's foremost advocates for agri-food research and innovation as well as an important voice to facilitate its dissemination to industry stakeholders.

The Agri-Food Innovation Council was previously known as the Agricultural Institute of Canada. In 2019, our organization rebranded to better reflect our nature and work.

We are funded through memberships and activities. All our funding is Canadian.

Supply Chain Issues

For the first time in recent history, some Canadians stared at empty shelves in grocery stores. For most, COVID-19 was the culprit. However, the reality is that COVID-19 only exacerbated existing supply chain issues.

To be clear, Canadians will find food in stores today, tomorrow and for the foreseeable future. But, unless some issues are dealt with, they will find the food to be more expensive and choices increasingly limited.

Climate change, pests and diseases, production issues, concerns on logistics, a lack of workforce: these are some of the challenges that the sector faces, are not going away and require bold solutions.

Here are clear examples where the supply chain experienced issues over the last two years:

- There were significant shortages of fertilizer (including glyphosate) and feed ingredients for livestock (including amino acids) in 2020 and again in 2021,
- Some farmers and agri-food companies were unable to repair machinery due to a shortage of spare parts;
- Distributors and transport companies experienced challenges:
    - Labour shortages: over 23,000 driver positions remained unfilled in the Summer of 2021, long before any vaccine mandate.
    - Additionally, there were costs increases (fuel, cost of repairs). Moving of goods became not only more expensive but also occasionally was simply not feasible leading to food waste.
- Processing plants also experienced significant labour shortages.

The weather has had major impacts on the supply chain as well:

- Drought in Prairie provinces in 2021 resulted in the following production decreases across Canada:
    - Wheat – decrease of 38.5%,
    - Canola – decrease of 35.4% (the lowest level since 2007),
    - Barley – decrease of 35.3%,
    - Oat – decrease of 43%.
- In British Columbia, the 2021 wildfires (June – August) had an impact on poultry production while floods (November) destroyed farmland and limited dairy supply.

Overcoming challenges

The purpose of this brief is to point out that some of the solutions related to the challenges facing our agri-food supply chain can be solved through innovation - and that more concentrated efforts are needed to coordinate what is already being done.

But clearly, there are other issues:

- As Dr. James Nolan, a noted Professor in Agricultural and Resource Economics at the University of Saskatchewan indicates, one of the crucial issues moving forward will be the level of control over the share of sales/revenues that will be used by those who control the bottlenecks in the transportation logistics supply chain. This issue requires more research.
- Labour shortages plague various Canadian economic sectors. They certainly are having a negative impact on the agri-food supply chain. Different solutions exist: a more robust immigration policy, a review of some of the regulatory framework that may be creating an undue burden on the sector and research and innovation (we elaborate further in this document).
- Dr. Richard Gray, Professor and Grain Policy Chair at the Department of Agricultural and Resource Economics at the University of Saskatchewan also indicates that logistics management is a key to success. He also agrees – more research needs to be undertaken.

Research and Innovation's Role – Overcoming challenges

Research and innovation can bring solutions to some of the problems facing our agri-food supply chain.

Dealing with production

Losing production has an impact on our supply chain. Research is happening at many levels to deal with issues related to disease and climate change.

Examples of such research abound:

- Genomics research and innovation is being used to improve yield and disease resistance in a project that has the University of Laval and SoyaGen partnering.
- The University of Saskatchewan and the University of Alberta are developing a precision diagnostic support network and cutting-edge computing tools for the livestock industry to manage genomic test data, assess risk and inform therapy decisions leading to direct and immediate benefits to the livestock industry, animal health and consumers and public health. The project is called Genomics ASSETS.

These projects are funded and supported by Genome Canada's regional centres. Indeed, genomics is crucial to Canada's agriculture. We're pleased to see the active role played by Genome Canada – not just in food production but also in supporting other sectors such as cannabis production.

Aurora, one of Canada's premier cannabis producers, has led the way with research projects to deal with powdery mildew – something that can cost the industry about 5% of its production (a cost in the tens of millions of dollars). The company is investing $2.1 million in research, matched by Genome Canada and Genome BC to find solutions. "This type of support is critical to our work and to supporting a still fledgling industry," said Charles Pick, Senior Vice President of Science and Innovation at Aurora.

Canadian farmers feeding Canadian families

While the slogan "farmer feed cities" is often used, it should be noted that about 80% of Canada's fruits and vegetables are imported. This makes Canada dependent on an international logistics system and creates more uncertainty for Canadians.

However, Canada is a country that has developed new crops (canola) and that makes (good) wine with vines grown in places where the temperature goes below -30. These advances were not the result of pure luck but rather research and innovation that led to concrete actions that in turn supported employment, created wealth and contributed to our GDP.

More can be done. Specifically, Canada should invest in research that would lead Canada to grow more fruits and vegetables. At the same time, we also need to be careful that the end result is affordable. This requires targeted investments.

Dr. Steve Webb, Executive Officer and CEO of the Global Institute for Food Security based in Saskatoon, suggests that research needs to be done to improve efficiencies of components and systems used in vertical farming; design plant/crop varieties specifically customized for vertical farming and; develop cost-effective distribution systems for the produce.

These investments would enable the establishment of efficient hydronics and aeroponics systems to produce fresh, healthy and nutritious produce year-end such as vegetables and herbs. They would also recycle water, reduce harvest spoilage and transportation costs and enable sustainable production systems and profitability for producers.

We welcome the very recent announcement by the Weston Foundation to launch an innovation hub to enhance food security. Initiatives such as theirs are much needed. The federal government should support these activities.

Capacity in Processing Plants

Workforce availability is an issue for farms from milking cows to harvesting crops (especially fruits and vegetables). Processing plants have similarly been severely affected. While the pandemic has highlighted the sector's key vulnerabilities, the issues have existed long before the onset of COVID-19.

Robotics and artificial intelligence will be key to solving some of the issues. In December 2020, Agriculture and Agri-Food Canada (AAFC) launched a "challenge" to develop new technologies in the Canadian Meat Processing Industry.

We welcomed the program and hope for more.

We must remember that research and innovation is only one part of the equation. The other equally important part is adoption and implementation of that innovation. When sizeable capital investments are required, governments also have a role to play and that includes supporting some industries that should be deemed "essential" such as agri-food and related sectors.

Logistics

Producing food is one thing, getting it to market in a timely manner is another. Logistics play a key role in the food supply continuum. But the system has been plagued by various issues – in rail, trucking, ports and the availability of containers.

Research also has a role to play. It is startling to see that about 79% of the logistics companies use spreadsheets for supply chain planning (based on a survey undertaken by Ventana Research). We are in the 21st century.

Quantum computing has the capacity to provide efficiencies in the supply chain. As Dr. Nolan wrote, quantum computing assists with optimization programs and, by extension, logistics. However, there are concerns that its cost will make it unaffordable for smaller companies, and ultimately concentrate control in the larger companies, thereby limiting competition. Further research should be undertaken to determine how quantum computing could be made more affordable and accessible – and therefore better enable its adoption.

A national strategy on agri-food research and innovation

Agri-food in Canada has strong innovative potential and is the key driver of economic growth. It is one of Canada's best performing sectors. In order for Canada's agri-food sector to continue to meet the world market's growing demand, innovation must be supported through science-based policy and needs-specific funding.

AIC believes a national strategy would provide direction, enable increased collaboration and target and streamline efforts to achieve real objectives within set timelines. A national strategy would bring together key support from across the government, private sector and academia – and break down silos.

With limited resources, we must revive the conversation around the importance of the agri-food sector, innovation and research. The need for a national strategy should be a key priority for our country.

Summary of Recommendations

1. AIC recommends that the Canadian government support or continue to support the following research and innovation in relation to agri-food. Some examples:
    - Genomics to reduce the impact of diseases, pests and climate change;
    - Sustainable and affordable production of more vegetables and fruits to enable Canada to be more self-sufficient;
    - Robotics and artificial intelligence to address the current workforce gaps – for both farms and processing plants,
    - Investigate the ways quantum computing could provide efficiency to logistics.
2. That the government implement Dominic Barton's recommendation to create "an interdepartmental task force on agri-food". The specific recommendation was to have the Minister of Agriculture and Agri-Food Canada chair this task force and have it supported by the Prime Minister's Office.
3. Support the development of a national strategy on agri-food research and innovation. The effort should be co-chaired by a federal government representative and another person chosen by industry and include all stakeholders including (but not limited to): provincial governments, industry (private companies and NGOs), academia.