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Skills needs for plant-based proteins (agriculture and food manufacturing) in Manitoba and Saskatchewan

Summary for policymakers

About the PLACE Centre

The PLACE Centre, which stands for Propelling Locally Accelerated Clean Economies, focuses on the complex challenges limiting clean economic growth in Canadian communities. Our core approach is “place-based,” meaning the PLACE team works with all levels of government, industry, and civil society organizations to ensure regions across Canada have the solutions needed to overcome the challenges they face in advancing clean economic growth. With this approach, the PLACE team can create practical, place-based recommendations where everyone involved can collaborate and work towards making progress in solving these problems. That way, every region and community across the country can be included in, and benefit from, Canada’s growing clean economy.

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About Smart Prosperity Institute

Smart Prosperity Institute is a national research network and policy think tank based at the University of Ottawa. We deliver world-class research and work with public and private partners to advance practical policies and market solutions for a stronger, cleaner economy.

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About the Future Skills Centre

The Future Skills Centre (FSC) is a forward-thinking centre for research and collaboration dedicated to driving innovation in skills development so that everyone in Canada can be prepared for the future of work. We partner with policymakers, researchers, practitioners, employers and labour, and post-secondary institutions to solve pressing labour market challenges and ensure that everyone can benefit from relevant lifelong learning opportunities. We are founded by a consortium whose members are Toronto Metropolitan University, Blueprint, and The Conference Board of Canada, and are funded by the Government of Canada’s Future Skills Program.

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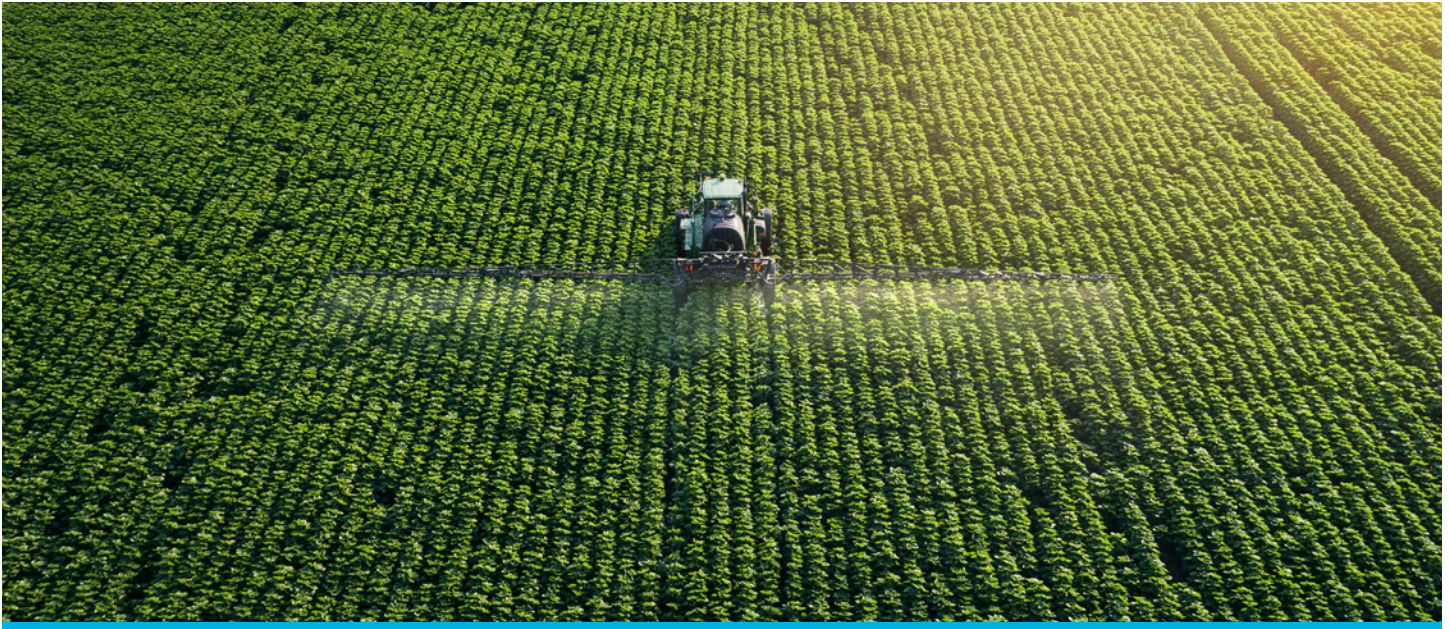
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Skills needs for plant-based proteins (agriculture and food manufacturing) in Manitoba and Saskatchewan

The world is growing. As the global population is set to increase to 9.7 billion by 2050, the demand for food and protein will follow.¹ Agricultural production will need to generate a sufficient supply to feed the world, and some of this demand will be for plant-based proteins (PBP) and the products made from them. In 2017, Canada was the fifth largest global exporter of agri-food products, worth over \$55 billion, and is already a world leader in growing the crops needed for making PBP products, including pulses, oilseeds, and other grains.² Major investments have been made in Saskatchewan (SK) and Manitoba (MB) for facilities to process and manufacture these crops, including:

- Roquette built the world's largest pea processing plant in late 2021 in Portage la Prairie, MB³;
- Cargill and Viterro separately announced plans to build canola crushing facilities in Regina, SK, to be operational in 2024⁴;
- FCL and AGT Foods announced their joint investment of a \$2 billion canola-crushing and biodiesel plant in Regina, to be completed by 2027⁵; and,
- Burcon NutraScience Corporation's pilot plant received funding in 2023, which will provide processing and scale-up validation services in Winnipeg, MB.⁶

For Canada, plant protein crops are not new, but their branding as “plant-based proteins” and the emergence of a greater variety of final consumer products at retailers is novel for the Canadian industry.

Provincial and federal governments have made optimistic projections about the future of PBP products in Canada, saying that, with the right supports, the sector could contribute \$25 billion to the national GDP by 2035.⁷

Manitoba alone wants to grow its protein sector by attracting \$1.5 billion in investment and creating 1,550 jobs by 2025.⁸ By identifying what new skills requirements these jobs will bring and by developing smart and collaborative approaches and policies to train, upskill, and reskill workers, Manitoba and Saskatchewan can begin to realize the benefits presented by the growth of PBP products.

This summary document, captures the ideas, analysis, and recommendations put forward in two Smart Prosperity Institute (SPI) reports detailing the skills and labour needs and the challenges in the PBP supply chain: [*Ingredients for growth: How the emergence of plant-based protein opportunities in Saskatchewan and Manitoba will impact workers and future skills needs*](#), and [*Preparing for plants: What is needed to cultivate the future skills required for workers and businesses in Saskatchewan and Manitoba's plant-based protein ecosystem*](#). Research for these reports was collected through a combination of surveys, interviews, and informal discussions with stakeholders across Manitoba and Saskatchewan's agriculture and food manufacturing sectors, supplemented by a literature review and quantitative analysis about future skills and knowledge needs for workers. Additionally, two workshops were hosted (one in-person workshop focusing on food manufacturing in Winnipeg and one virtual workshop convening agricultural sector stakeholders in the Prairies) to support discussions about specific challenges the sector faced in each region. For more insights about the methodologies used to generate these findings, please refer to the appendices of *Ingredients for growth*.

Abbreviations

MB	Manitoba
PBP	Plant-based protein
SK	Saskatchewan
SME	Small and medium-sized enterprise
SPI	Smart Prosperity Institute
TFW	Temporary foreign worker
WIL	Work-integrated learning



How will the emergence of plant-based protein products influence different sectors?

The supply chain for all PBP products starts with growing raw materials on farms and ends with the sale of final consumer products. The supply chain has several components to transform raw materials on a farm (like peas, lentils, and soybeans) to products sold to consumers (like plant-protein-fortified staples and plant-based burgers). Figure 1 overviews a high-level supply chain for these products, showing which sectors will be involved in capturing this market opportunity.

Within each sector, different activities will be required. Crops high in protein are used to make PBP products, meaning farms producing oilseeds, grains, pulses, and legumes will need to grow and cultivate higher yields. Processing activities can either involve preparing ingredients to be sold as is (which would include being cleaned and dried in a grain dryer), or further processing grains, pulses, and legumes to create ingredients (such as flours, fibres, and isolates) or final products that can be purchased and consumed. Retail producers working in customer-facing or sales roles will also be impacted, as novel products will require greater familiarity and understanding of PBP products to market and sell them effectively.

Figure 1. Which sectors would benefit from the growth of PBP products?

	Agriculture Raw materials	Manufacturing Ingredients	Manufacturing Final products	Retail market
Supply chain	Crops grown on farms: dry peas, lentils, chickpeas, beans, fava beans, etc.	Raw materials are cleaned and further processed into ingredients like flours, fibres, starches, and protein isolates.	Ingredients are used to manufacture final products like plant-based burgers, snacks, and protein-fortified staples.	Final products are sold to consumers.
Selected NAICS codes	Oilseed & grain farming (1111) Vegetable & melon farming (1112) Other crop farming (1119) Support activities for crop production (1151)	Grain & oilseed milling (3112)	Fruit and vegetable preserving and specialty food manufacturing (3114) Dairy product manufacturing (3115) Bakeries and tortilla manufacturing (3118) Other food manufacturing (3119)	Farm product merchant wholesalers (4111) Food merchant wholesalers (4131) Beverage merchant wholesalers (4132) Grocery and related product merchant wholesalers (4244) Grocery and convenience retailers (4451) Specialty food stores (4452) Warehousing and storage (4931)



How will this new opportunity influence the skills workers need in these sectors?

Some of the jobs projected to be most in demand in the sectors that will experience growth due to PBP production may look quite different than current roles within agriculture or agri-food manufacturing. These include sales and marketing specialists, general or agricultural technology specialists, policy managers,

and researchers for more rural and remote workplaces.⁹ Additionally, skills like digital literacy, machinery maintenance and repair, research, supply chain management, and regulatory and environment, social, and governance knowledge were identified by stakeholders as being the likely most-in-demand skills facing companies in this supply chain in the next three to five years. Table 1 below summarizes some expected skills needs and shows how they will impact different occupations.

Table 1. Trends affecting each sub-sector in the PBP supply chain, and their implications for jobs and skills¹⁰

Sub-sector (NAICS)	Trends impacting sub-sector	Future occupations in demand	Future skills in demand
Oilseed and grain farming (1111)	<ul style="list-style-type: none"> Farm consolidation, larger individual farms Labour shortage Aging workforce and retirements Increased use of “agtech” (digital and automated technologies) Increasing sustainability requirements 	<ul style="list-style-type: none"> General farm workers Managers in agriculture 	<ul style="list-style-type: none"> Judgment and decision making Critical thinking Time management Job-specific technical knowledge Communication Interpersonal relationships
Grain and oilseed milling (3112)	<ul style="list-style-type: none"> Increased automation and mechanization Labour shortage 	<ul style="list-style-type: none"> Labourers Mechanical assemblers and inspectors 	<ul style="list-style-type: none"> Judgment and decision making Critical thinking Time management Job-specific technical knowledge Communication
Other food manufacturing (3119)	<ul style="list-style-type: none"> Increased automation and mechanization Labour shortage 	<ul style="list-style-type: none"> Labourers and machine operators in food and beverage processing Testers and graders in food and beverage processing Food science researchers Supervisors Food product developers Sales representatives Mechanical assemblers and inspectors 	<ul style="list-style-type: none"> Computers and electronics Judgment and decision making Critical thinking Equipment maintenance Production and processing

What will be required from the workforce to learn these skills?

As workers, employers, and industry stakeholders consider what is needed to help workers learn new skills, a few key points will be important to remember:

The biggest skills and labour challenge faced by sectors in this supply chain is not skills gaps, but labour shortages.

In 2022, labour shortages caused 48% of agri-businesses to turn down sales or contracts and 41% to reduce their service offerings.¹¹ The labour gap will likely increase to one in four 'grain and oilseed' jobs being left open because of a shortage of available workers.¹² This lack of workers could prevent companies from meeting current operational requirements, let alone considering growth opportunities into PBP products.

The most significant difficulties employers face when recruiting for in-demand roles are a lack of on-the-job experience, difficulty relocating, and high competition for existing workers in these sectors.

Stakeholders also detailed how the agriculture and agri-food sectors are not viewed as good career prospects, in part because many potential workers are unaware of the opportunities available.¹³

Employers identified similar skills gaps for the majority of in-demand positions today.

Respondents said that, compared to job expectations, workers were most deficient in job-specific technical knowledge, judgment and decision making, time management, and critical thinking. The most in-demand occupations with these skills gaps included managers in agriculture, general farm workers, and sales and account representatives.

Stakeholders in the sector expressed confidence that the existing workforce could learn new skills, but expressed concerns about how well new additions to the workforce could adapt.

Stakeholders generally expressed uncertainty about how students, recent graduates, and newcomers to Canada would fare in learning new or existing skills, given the need to layer new skills on top of existing industry knowledge.

As automation becomes more widespread in food manufacturing, some jobs will become more in demand, but it may not increase or decrease the net jobs required by small and medium-sized enterprises (SMEs).

As companies mitigate their employment shortage through more factory automation and digitization, they will need more repair technicians, mechanical engineers, and machine operators. SMEs already operate lean workforces, in part due to a current lack of available entry-level workers. While this trend could change their operations, it will not change the overall number of workers since new people will be needed to operate, oversee, repair, and improve on technology.¹⁴

What challenges will the sector face as it seeks to grow?

While this opportunity could create jobs and attract investment to these two Prairie provinces, there have been some concerns from stakeholders that the industry and its workers are not prepared to take full advantage of the opportunity. Stakeholders have identified a range of challenges holding back growth in the sector. These range from severe labour shortages that can lead companies to hire "anyone with a pulse" to a lack of housing and wastewater processing infrastructure that raises costs and prevents production facilities from operating at their full potential. Additionally, internal capacity challenges make it incredibly difficult for SMEs to innovate and hire within this growing supply chain. Some of the challenges faced in this supply chain are common across all sectors, such as increasing rates of retirement and a lack of understanding amongst the general public about potentially attractive career opportunities within the sector, while others are more sector or stakeholder-specific.

These challenges are not simply inconveniences for those looking to bolster profit margins. If unaddressed, they could prevent businesses from realizing the full potential of the PBP opportunity. The case of Merit Functional Foods offers a cautionary tale in the face of sky-high expectations. Merit had been one of the leading companies investing in PBP manufacturing in Manitoba, netting multi-million dollar funding agreements and building a new 94,000-square-foot processing facility in Winnipeg, MB. Despite receiving \$116.5 million dollars in federal and provincial funding (both directly and through training rebates),¹⁵ in 2023, Merit declared bankruptcy, was sold to its parent company, and laid off 75% of its workforce.¹⁶ The company's lack of success was attributed to factors ranging from the high costs of inputs to labour shortages to delays in new product development.¹⁷ Merit's struggle shows that direct investment into companies, whether from public or private funding sources, and positive press are not enough to ensure that PBP industry will be a future driver of economic growth in Manitoba and Saskatchewan. Organizations, both small and large, also need infrastructure, utilities, education programs, and access to a workforce that possess in-demand skills to ensure success.

What challenges need to be overcome to create the supports needed for the industry to create jobs, and support worker skills and training efforts?

Different challenges will be experienced throughout the supply chain but can be thought of in two categories: capacity-related (issues that impact a business's ability to maintain current levels of operations or support growth and are largely determined by decisions made within the business or sector), and environmental (major economic or societal trends that shape or influence the outlook for an entire sector).

In agriculture:

Capacity challenges

- Organizations are struggling with staff retention. Much of this is due to a combination of retirements and a lack of sufficient workers to replace those exiting the sector. Labour market projections from the Canadian Agricultural Human Resource Council have found that almost 37% of the open vacancies in agriculture are for general farm labourers — a percentage that is projected to increase to 51% in 2029.¹⁸
- Businesses need more certainty around hiring through immigration programs. While many employers hire Temporary Foreign Workers (TFWs) within the sector, these same employers also complain about their limited ability to transition TFWs into sponsorship or residency programming. Only 2% of those in the Seasonal Agricultural Workers Program transitioned to receive permanent residency between 2005 and 2009; this is the lowest rate of transition by work permit type across all industry sectors which use similar immigration programs.¹⁹ This limits an organization's ability to retain talented individuals and invest in worker training while also creating uncertainty for workers who may want to stay in their job but face barriers in doing so.

Environmental challenges

- Consolidation of farm sizes is changing on-farm skills and labour needs. With fewer farms and farm operators needed as a result of consolidating land sizes (partially driven by retirement-based land sale decisions), the number of farms with a single owner-operator is shrinking. Self-employed owner-operators have different job requirements than others, often undertaking everything themselves. Larger farm sizes are prompting a need to adopt a more traditional corporate structure and hire more staff, including management, human resources, and technical support.
- Large numbers of retirements are not being replaced at sufficient rates to prevent labour shortages. The agriculture sector has a ratio of almost 3:1 between workers aged 55+ and workers aged 25-34.²⁰ As more workers retire, businesses will struggle to find workers to fill these roles, and it will become harder for previous generations of agricultural workers to mentor and train incoming workers.

- Employer expectations are not aligned with the skill sets, knowledge areas, and experiences of the recent graduates they typically hire. Many employers want graduates to be knowledgeable in topics such as mechanical repair, digital literacy, botany, and machinery operations, among others, in addition to core agricultural requirements and experience working on a farm. Yet many entry-level workers do not have these skills given that most are new graduates who lack professional experience.

In food and beverage manufacturing:

Capacity challenges

- Wages paid within the sector are typically lower than in other industries, with average pay in the sector in 2020 being \$21.20/hour, compared to an average manufacturing wage of \$30.36/hour.²¹ This is leading to increased poaching of workers between sectors, especially those in non-renewable resource industries such as potash mining and oil and gas extraction. These sectors have similar skills requirements but pay higher wages.
- Rural locations for many production facilities pose a barrier to attracting talent since plants have a smaller surrounding talent pool to draw from, and it is harder to convince newcomers to Canada to settle in rural regions.
- Insufficient space to help SMEs conduct research and development activities. Production processes such as extrusion, fermentation, and wet and dry fractionalization require dedicated facilities for product research and development. Many SMEs share laboratory space to reduce fixed costs, and stakeholders report there is not enough laboratory space to accommodate demand.

Environmental challenges

- The sector also faces severe labour shortages, concentrated in entry-level positions. A survey from the Canadian Federation for Independent Businesses found that 63% of agri-food businesses could not hire all the staff they needed, and 62% of business owners said they found it difficult to very difficult to hire new staff.²² Employers are so desperately in need of labour that they have reported a willingness to hire individuals without any relevant education or experience for entry-level positions and then train them on the job.
- There is a lack of visibility and perceived attractiveness for food and beverage manufacturing careers. Only one in four Canadians said they were familiar with the food and beverage processing industry, and only one in six said they would consider applying for a nearby job in that industry.²³
- Negative perceptions of the sector exist due to examples of abusive or discriminatory treatment for many within the sector, including TFWs. While most employers do not conduct these practices, the reality is that many instances of historic abuses have created a perspective that the sector is not a good place to work.²⁴ One way this reputational damage can be addressed is by removing the loopholes exploited by bad actors in the past and putting new pathways in place to greater emphasize worker well-being.

Box 1

Which challenges do stakeholders expect will impact the PBP supply chain moving forward?

- **Automation and digitization:** As the use of precision agriculture technologies (such as drone imagery, GIS field mapping, and automated fertilizer and pesticide applications) grows, so will the needs of workers to set up, operate, and maintain digital solutions. This may require additional certifications and licenses for workers asked to complete these tasks, such as the mandatory agriculture drone pilot certification administered by Transport Canada.²⁵
- **Increased reliance on immigrant workers:** Due to the lack of entry-level labour in the Canadian workforce, agricultural businesses will increasingly rely on international workers, especially TFWs, to fill vacant occupations. To support this, employers and policymakers will need to invest in settlement and support services, such as ensuring reliable transportation to and from job sites, allowing workers to take English language courses, and better recognizing foreign credentials.²⁶
- **More focus on sales and marketing of novel products:** A survey from the Agri-food Analytics Lab at Dalhousie University found that about one in three Canadians are aware of PBP products and other types of cultured proteins, but that only one in five considered themselves knowledgeable about the products.²⁷ Companies will need to overcome this gap through effective sales and marketing efforts and improve their capacity to pivot quickly in response to shifts in consumer interest.
- **Some immigration programs do not include the industries found in the PBP supply chain:** PBP manufacturing, as a more novel industry, has been ineligible for some of the programs intended to help food manufacturers bring in new employees. One such example is the Agri-Food Pilot program, which only targets workers in meat production, greenhouse and nursery production, and non-aquaculture animal production, inadvertently screening out those seeking to enter to work in PBP production.²⁸
- **Need for stronger and more reliable utilities:** In rural communities, utilities and infrastructure connections are typically not constructed at the level needed to sustain high levels of growth. Reportedly, Roquette's pea protein production facility in Portage la Prairie, MB has never been able to operate at 100% capacity, in part due to a lack of wastewater processing infrastructure at the municipal level to sustain full operations.²⁹
- **Lack of affordable housing, transportation, and childcare options for workers at the community level:** Access to these three types of supports is critical for individuals deciding whether to take a new job or move to a new location.³⁰ However, rural communities have fewer options for all three, especially for newcomers arriving without established social networks. This increases the difficulty of attracting workers to open positions.



What do governments, industry, and post-secondary institutions need to do to tackle these challenges?

To improve the awareness and attractiveness of working in the agriculture and agri-food sector, governments and industry should do the following:

- Partner with educational institutions to offer students work-integrated learning (WIL) opportunities as well as to increase awareness of career options in the PBP supply chain and reduce stereotypes about agricultural and manufacturing work.
- Promote job opportunities through non-profits to non-traditional farm communities and underrepresented and equity-deserving groups.
- Work with businesses and industry associations to make students and recent graduates aware of the in-province opportunities in the PBP supply chain.
- Work with municipal and provincial policymakers to increasingly incorporate a holistic worker approach when planning how to support and attract businesses in their jurisdictions, going beyond zoning and taxes to include utility connections, transportation, housing, and access to immigration services.

To improve the ease of immigrating to Canada for both workers and employers, governments should do the following:

- TFW visas should be modified to allow for greater flexibility by expanding to specific regions or industries involved in the PBP product supply chain.
- Expand access to federal programs like the Agri-Food Pilot program (an immigration program focused on bringing in workers for specific agriculture and agri-food businesses and occupations).
- Saskatchewan should expand its Provincial Nominee Program and reduce some of the existing requirements the program has for post-secondary education. Additionally, Saskatchewan should implement additional TFW worker protections, similar to Manitoba's *Worker Recruitment and Protection Act*.
- Saskatchewan and Manitoba should implement automatic spousal work visas for high-need agricultural and manufacturing industries, as well as create clearer pathways to permanent residency that will strengthen initiatives like the TFW program and the Post-Graduation Work Permit program.

To better prepare graduates for working in the agricultural and agri-food sector, industry and post-secondary institutions should do the following:

- Expand program options in certificates, diplomas, and training programs at colleges and other educational institutions to include in-province programs for critically needed skills in the PBP supply chain.
- Create additional opportunities for post-secondary placements, experiential learning, and WIL programs that are also open to international students.
- Collaborate with industry bodies to explore the development and use of a decentralized learning recognition model and framework that includes mechanisms like micro-credentials and delivers training in a flexible format.
- Training programs for existing workers in agriculture could be better scheduled to fit around planting and harvesting. This could help increase skill development and make it easier for workers to train during the off-season by completing existing courses for critical and emerging skills.
- Consider offering training in additional languages spoken by the most common provincial immigrant populations.



Conclusion

Growing and manufacturing PBP products in Canada is a strong and novel clean growth opportunity. More is needed however, to ensure Manitoba and Saskatchewan are ready to meet this opportunity. Plants alone, both in terms of production facilities and biological photosynthesizers, are not enough to capture these benefits. More must be done to cultivate this ecosystem to take advantage of the opportunity presented by PBP products.

Addressing the significant sector-wide labour shortages and the impending wave of retirements in agriculture and agri-food is paramount.

Workers will need access to skills and training programs for new and emerging skills, and those programs will need to combine traditional delivery mechanisms with both online and on-the-job training. Businesses will need to attract and retain workers by expanding the awareness of what career options are available and by supporting the needs of a younger generation of workers. Policymakers at all levels of government will need to create stronger and clearer pathways to permanent residency for international workers and adopt a more holistic approach to designing infrastructure and community support around workers and their families. If this can be accomplished, the reward could be a \$25 billion industry in the Prairies, creating jobs and prosperity for generations to come.

For additional details and discussion on any of the ideas, analyses, or recommendations presented in this summary for policymakers, please read SPI's two reports: [*Ingredients for growth: How the emergence of plant-based protein opportunities in Saskatchewan and Manitoba will impact workers and future skills needs*](#), and [*Preparing for plants: What is needed to cultivate the future skills required for workers and businesses in Saskatchewan and Manitoba's plant-based protein ecosystem*](#).

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