

# Labour Market Information

for the Agriculture and Agri-Food sector  
in Newfoundland and Labrador



THE NEWFOUNDLAND AND LABRADOR  
FEDERATION OF AGRICULTURE

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# 1. Introduction

In response to the Government of Newfoundland and Labrador's *A Way Forward Strategy*, the agriculture and agri-food industry, developed an Agriculture Sector Work Plan to increase employment and economic activity throughout the province. As a part of the Sector Work Plan, the Newfoundland and Labrador Federation of Agriculture undertook a research project to identify the human capital requirements to increase the province's food self-sufficiency.

To achieve this target, the Newfoundland and Labrador Federation of Agriculture has developed a ten-year labour market forecast with a focus on occupations in on-farm production and primary processing. The forecast, including low, medium, and high growth scenarios was developed through a detailed analysis of the province's labour market and illustrates the opportunities that the provinces has to grow the agriculture and agri-food industries in the coming years.

Two industries, Field Vegetable Production and

Small-scale Dairy Processing were selected for a detailed occupational analysis. National Occupational Standards, Competency Profiles, and Skills Gap Analyses were developed for managers and workers in these industries. A review of the Training Capacity within and outside of the province was undertaken for these industries. Finally, Occupational Profiles for these occupations were drafted to promote the opportunities for these occupations in Newfoundland and Labrador.

Labour market information about occupations in need and training required for these occupations will move the province forward in realizing its goal to increase food self-sufficiency in the coming years. The labour market forecasts and occupational analyses will provide valuable information to job seekers, educators and government policymakers about current and future job opportunities to help attain this goal.

## 2. Project Objectives

The objectives of the research project were:

1. Develop a ten-year forecast for occupations for the agricultural and agri-food sector, with a focus on on-farm production and primary processing in Newfoundland and Labrador.
2. Complete a review of occupational requirements for agricultural occupations in selected two selected industries.

The research was led by the Newfoundland and Labrador Federation of Agriculture and included expertise from the Canadian Agricultural Human Resource Council, the Conference Board of Canada, and the Human Resource Systems Group.

### 3. Agriculture and Agri-Food in Newfoundland and Labrador

The agri-food sector plays an important part in Newfoundland and Labrador's economy. In 2017, it employed roughly 1,750 people, or 0.8% of total employment in Newfoundland and Labrador. In addition, it generated over \$105 million, or 0.3%, of Newfoundland and Labrador's annual GDP. However, the industry's performance over the past decade has been mixed. Between 2008 and 2017, primary agricultural<sup>1</sup> employment in the province has more than doubled, whereas the number employed in food processing activities<sup>2</sup> has fallen by roughly 25%. However, as part of efforts by the Provincial Government and the Newfoundland and Labrador Federation of Agriculture to promote greater food self-sufficiency and boost the contribution of agri-food to the economy, both primary agriculture and food processing activities are positioned to enter a period of growth over the next decade which is expected to lead to greater demand for workers.

The objective of this study is to assess the implications of stronger production on future labour requirements in the province and to evaluate where labour shortages are likely to

be the most acute over the next ten years. An economic model was created for this project which forecasts agri-food labour demand and domestic supply by industry, by commodity group, and by occupation. Recognizing that the future is inherently uncertain and future market conditions are subject to a variety of influences outside the control of producers, this report also covers three distinct scenarios for future production by commodity – low growth, medium growth, and high growth, where each generates a unique trajectory of future labour demand in the industry.

This project also included a survey of agri-food employers in the province which identified the key HR challenges employers face, and the solutions they feel would provide the most effective support to the industry. The results can be leveraged by the government and its partners to mitigate the impact of labour shortages so that Newfoundland and Labrador's agri-food sector may reach its long-term production goals and potential.

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<sup>1</sup> For the purpose of this report, primary agriculture consists of all NAICS 11 industries, excluding 1125 – aquaculture.

<sup>2</sup> For the purposes of this report, food processing consists of NAICS 3114 – fruit and vegetable manufacturing; NAICS 3115 – dairy product manufacturing; 3116 – meat product manufacturing.

## 4. The Current State of the Agri-Food Labour Market

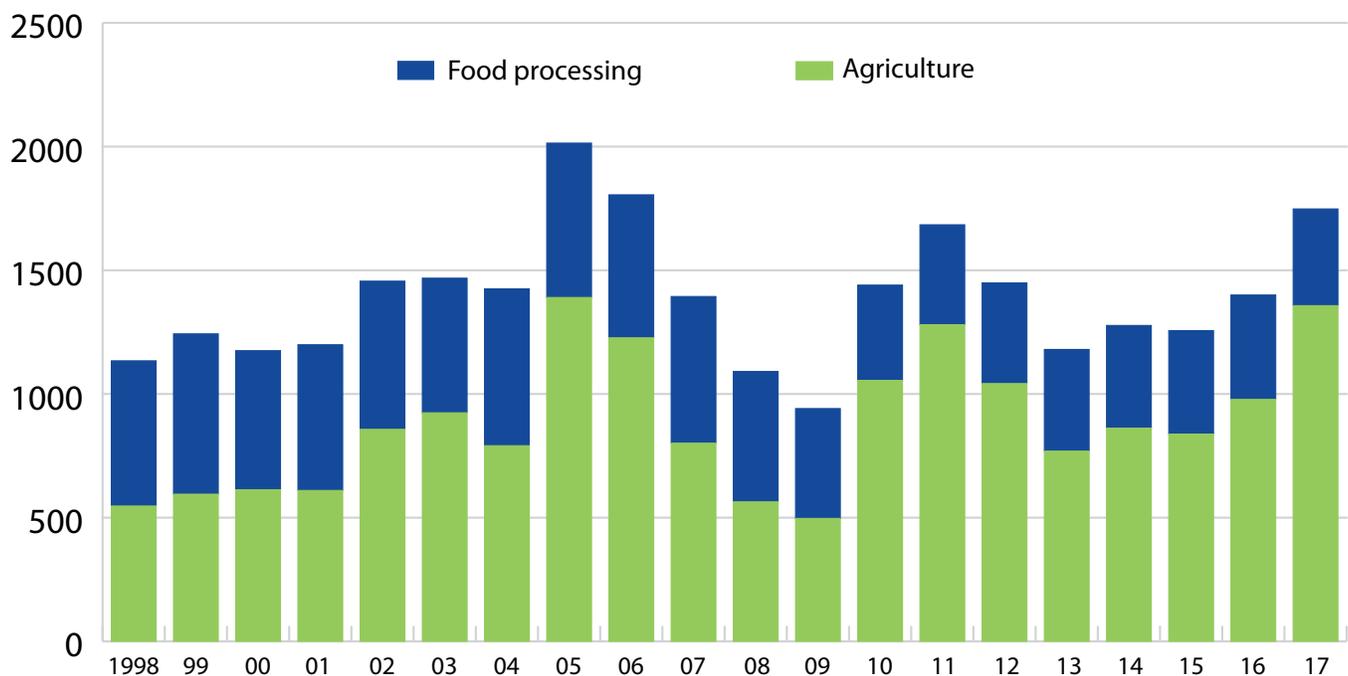
Since the sharp decline in employment the industry experienced between 2005 and 2009, agri-food employment in the province has gradually rebounded. In 2017, the sector employed roughly 1,750 workers — slightly below the 2005 peak of 2,000, but significantly higher than its average of 1,400 workers over the past two decades. (See Chart 1.) However, the recent rebound in the sector’s workforce has been uneven. On one hand, primary agriculture employment in the province has all but recovered to its 2005 high of approximately 1,400 workers.

On the other hand, food processing employment has fallen from more than 600 workers in 2005 to fewer than 400 in 2017.

Newfoundland and Labrador’s agri-food workforce is comprised almost entirely of domestic workers. In 2017, Canadian resident employees accounted for 98% of the province’s agri-food sector. The remaining 2% consists of foreign workers<sup>3</sup> and while this share remains relatively low, it is up from effectively zero a decade ago. (See Chart 2.)

**Chart 1: Employment in Newfoundland and Labrador’s Agri-Food Workforce Has Risen in Recent Years**

(employment by sector)

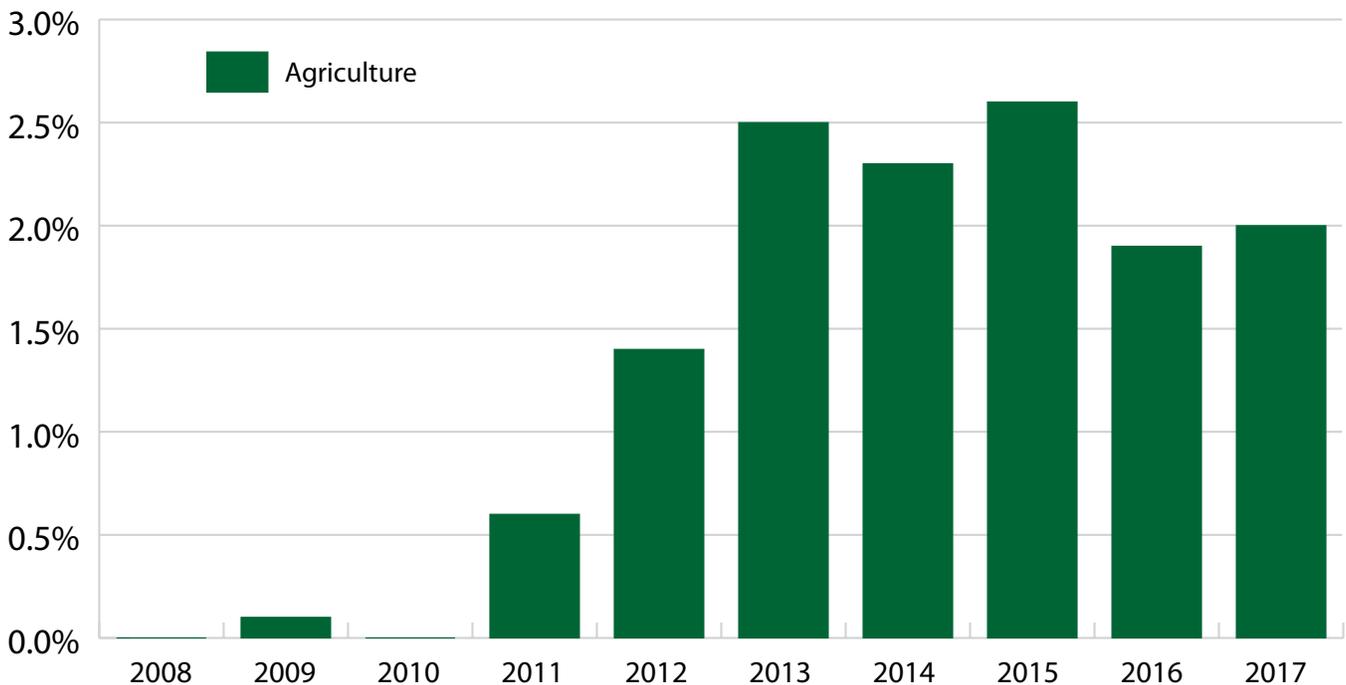


Source: Statistics Canada; Canadian Agricultural HR Council.

<sup>3</sup> For the purposes of this report, foreign workers refer to temporary foreign workers employed in agriculture which stem from one of the four main temporary foreign worker streams in Canada. They should not be confused with international immigrants.

## Chart 2: Foreign Workers Make Up Small Share of Agri-Food Workforce

(foreign worker share of agri-food workforce)



Source: Immigration, Refugee & Citizenship Canada; Employment and Social Development Canada; Canadian Agricultural HR Council.

All of the foreign workers employed in Newfoundland and Labrador's agri-food sector work in primary agriculture activities. This likely reflects the fact that most non-agricultural industries, such as food processing, do face greater barriers on temporary foreign worker use. But it is also worth noting that foreign workers are generally much less prevalent in Newfoundland and Labrador's agriculture sector than elsewhere in the country. Based on the results of CAHRC's employer survey, only 5.6% of farm operators in Newfoundland and Labrador reported hiring foreign workers in 2018, compared to 35.1% of farms across Canada.<sup>4</sup>

Thus, while foreign workers amount to just 2% of the agricultural workforce in Newfoundland and Labrador, they are 17% of the agricultural workforce nationwide.

Although foreign workers are infrequently employed in the province, they do help the sector manage its vacant positions. Data collected as part of this project from Statistics Canada indicates that there were roughly 50 positions that producers were not able to fill with domestic workers in the province's agriculture sector in 2017, which was equivalent to 3.5% of labour demand.<sup>5</sup> More than two-thirds of these positions were ultimately filled by foreign

<sup>4</sup> Canadian Agricultural Human Resource Council Employer Survey.

<sup>5</sup> Labour demand refers to the number of workers employers would like to hire at any given time. It consists of the number of workers who are currently employed (domestic and foreign) plus the number of unfilled vacancies that producers report.

workers, highlighting the role this labour source can play in helping employers manage short-term vacancies and periods of peak demand.

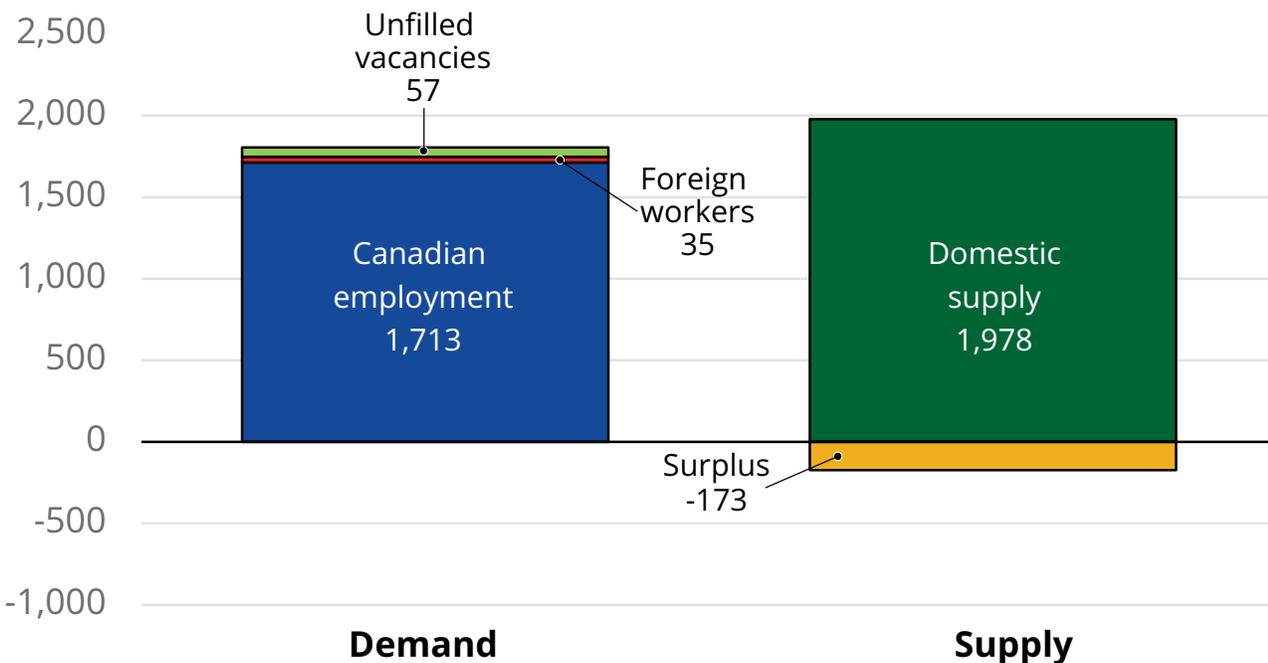
Nevertheless, the presence of foreign workers and unfilled vacancies does suggest that there are pockets of labour market pressures within the agri-food sector. For example, we estimate that the dairy sector currently faces a labour shortage of 32 workers, equal to 11% of the industry's labour demand. There are also shortages of key occupations across the industry, in particular farm managers and agricultural services contractors. Yet despite these specific instances, on an aggregate basis, the available information suggests that there is actually a small labour surplus in the provincial agri-food sector as the number of people reporting that they are willing to work in agri-food is actually greater

than the sector's reported labour requirements. (See Chart 3.) This dynamic is strongly indicative of a skills and geographic mismatch. Specifically, it suggests that there is an insufficient number of workers with the right skills, where employers need them.

This is an example of how, even in the presence of ample labour supply province-wide, labour shortages remain a vital concern for producers. Employers in the survey indicate that just less than 1 in every 10 positions in the agri-food sector goes unfilled. What is more, vacancies have real consequences for agri-food employers. Nearly 80% of employers said that unfilled positions resulted in excessive stress for the owner and other staff, and more than 50% said that it resulted in them cancelling or delaying upgrades or expansions which threatens the

### Chart 3: Breakdown of Newfoundland and Labrador's Agricultural Workforce

(agri-food workforce by category)



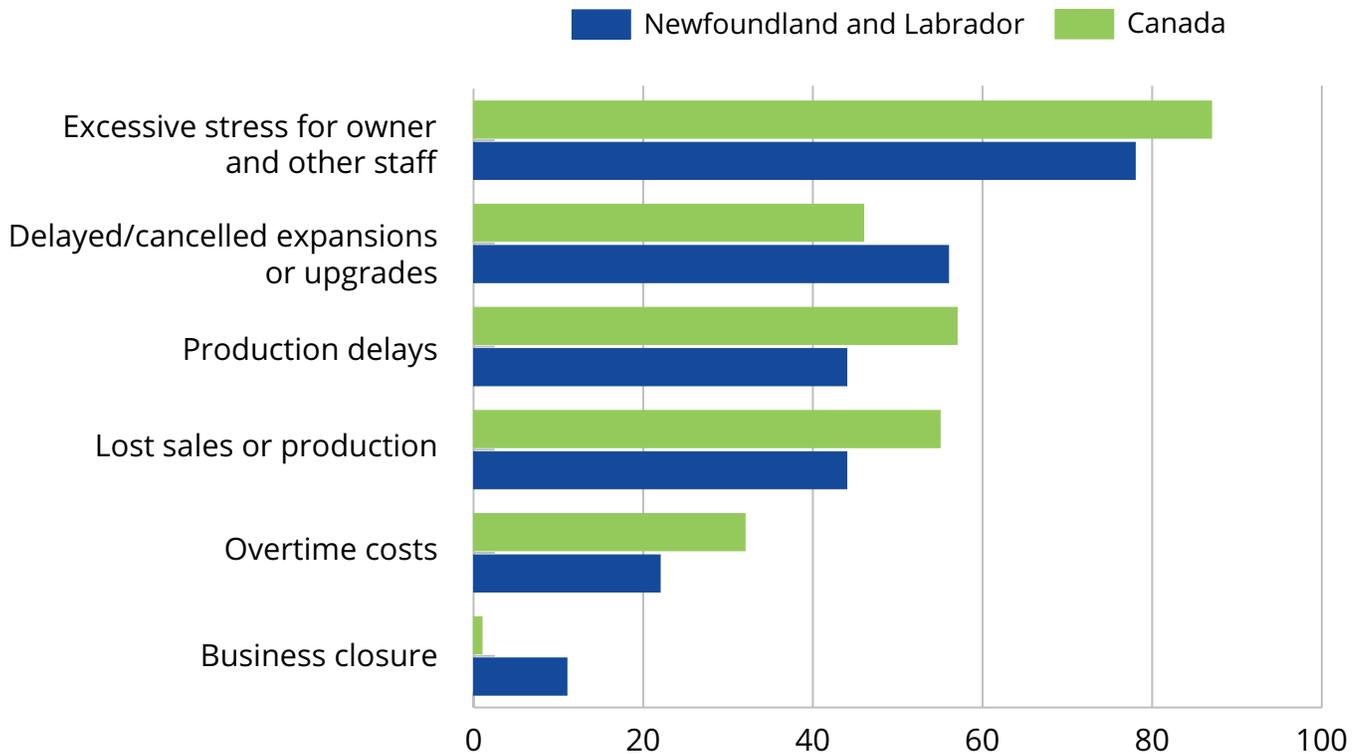
Source: Statistics Canada; Canadian Agricultural HR Council.

sector's long-term viability. (See Chart 4.) There are also real financial costs to the industry caused by labour shortages. More than 14% of producers in the survey said that unfilled positions cost them revenues, and on average,

the loss was equivalent to 22% of their existing sales. Thus, in 2018, the sector's revenues were reduced by roughly 3% because of labour shortages. (See Diagram 1.)

### Chart 4: Unfilled Vacancies Cost the Sector Now and in the Future

(share of employers with unfilled positions)



Based on surveys of a respective 9 and 514 respondents  
Source: Canadian Agricultural HR Council.

### Diagram 1: Lost Sales Estimate, Agri-Food Sector



Source: Canadian Agricultural HR Council.

## 5. Agri-Food's Widening Labour Gap

The previous chapter provided an overview of the current state of Newfoundland and Labrador's agri-food labour market and highlighted some of the key consequences that vacancies have on the sector. It is important to note however, that the dynamics between the available supply of domestic workers and the labour requirements of agri-food producers in the province have changed significantly over time. Indeed, the labour surplus that exists today is significantly smaller than just a decade ago – the excess of domestic labour supply relative to demand fell from 500 workers in 2007 to just 170 in 2017.

That trend is expected to continue in the years to come. In fact, the surplus of domestic labour is forecast to become a deficit within the next ten years. This is primarily a result of demographic trends. Driven by a growing number of retirements, net emigration, and fewer younger people available to take on agri-food jobs, the available supply of domestic labour is projected to contract significantly between 2018 and 2029. A secondary concern will be the future path of the agri-food sector's labour requirements, which is determined primarily by future production growth and productivity rates. All else equal, when firms produce more, they require more workers to do so. On the other hand, if the existing workforce becomes more productive, then firms require fewer workers to satisfy the same level of production.

The Canadian Agricultural HR Council has produced, for this project, a detailed overview of the future supply of domestic workers available to the agri-food sector in Newfoundland and Labrador and the key trends impacting this forecast are outlined below. However, the

main goal of this project is to explore different labour demand trajectories for the agri-food sector – low growth, medium growth, and high growth – to assess future labour requirements under a variety of assumptions. Combining these scenarios with the forecast of domestic labour supply yields a range of outcomes for the future balance between the two in the province's agri-food sector, and the implications of these outcomes are discussed at the conclusion of this chapter.

### 5.1 Trends Affecting Labour Supply

The supply of domestic labour is based on a stock-flow model where the initial stock of supply is taken from Statistics Canada's Labour Force Survey in 2017 and consists of the number of workers currently employed or unemployed, in the agri-food sector. Future supply of domestic labour depends on this initial stock of available labour, plus or minus the flow of future workers in and out of the sector's labour force on an annual basis. Demographic factors, including retirements, rates of interprovincial and international migration, and the number of young people entering the workforce from school are all key determinants of these future flows. Personal preferences for work, relative wages, and broader economic conditions can all influence these movements.

Overall, we expect the domestic labour supply available to work in agri-food will shrink over the forecast period, falling from 1,980 workers in 2017 to 1,460 in 2029. This decline in the availability of labour will be felt throughout

the sector, spanning all primary agricultural commodities and the associated processing activities.

### Retirements Will Weigh Heavily on Future Labour Supply

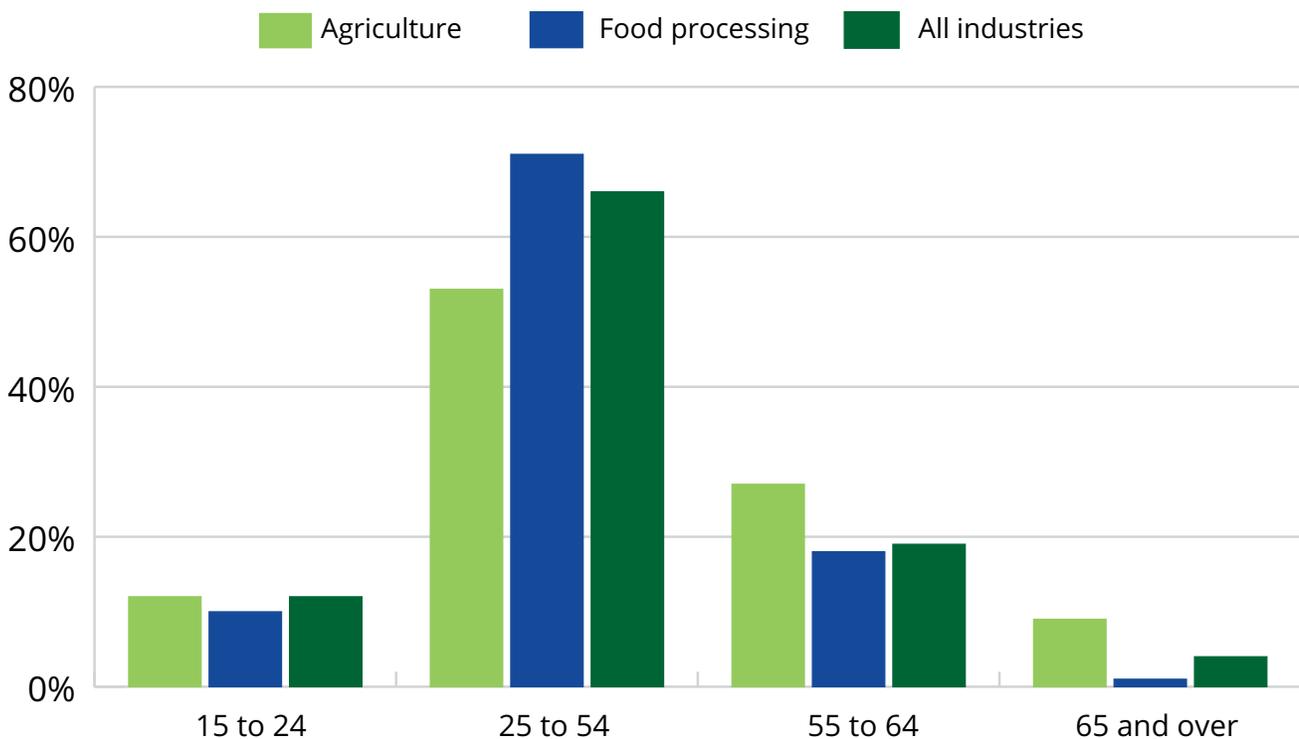
A rising number of retirements will be the most important factor driving the decline in the sector's labour supply in the next ten years and this trend is directly driven by the exit of the baby boomers from Canada's labour force. It is worth noting that baby boomers were born between 1946 and 1964, which means that the oldest workers from the cohort reached typical retirement age nearly a decade ago and that the very youngest baby boomer will have attained retirement age before

the end of the forecast period considered here.

The implications of the baby boomer exit will be profound and no industry in the Canadian economy will escape its impact on labour markets. However, primary agriculture starts from a weaker position as it is already much older than the Canadian average. In fact, 36% of the workforce is already 55 years or older compared to just 23% of the Canadian labour force in aggregate. (See Chart 5.) Moreover, nearly 10% of the agricultural labour force is already 65 years or older, which is more than twice the rate for the Canadian labour market as a whole. This suggests a significant number of imminent retirements from primary agriculture in the next several years alone. The demographic makeup for food

### Chart 5: Agriculture Workforce is Older-than-Average

(share of workers by age group)



Source: Statistics Canada Census 2016.

processing is somewhat more favourable, but there is still nearly 20% of the workforce that is 55 years or older. The impending labour crunch will boost competition for workers across all industries in the coming years, making it harder for agri-food employers to attract the necessary labour and skills they need to compete.

Compounding this problem is the fact that Newfoundland and Labrador has the lowest labour participation rates<sup>6</sup> for older cohorts in the country and participation rates decrease more quickly with age than elsewhere. For example, just 80.4% of people aged 50 to 54 in the province participate in the labour force compared to 85% for all of Canada. At 55 to 59 years old, the provincial share falls precipitously to just 67.5% (compared to 75.6% for Canada). By the time workers in the province reach between 60 and 64 years old, only 48.5% are in the labour force (compared 56.5%), and just 11% in the province over the age of 65 participate

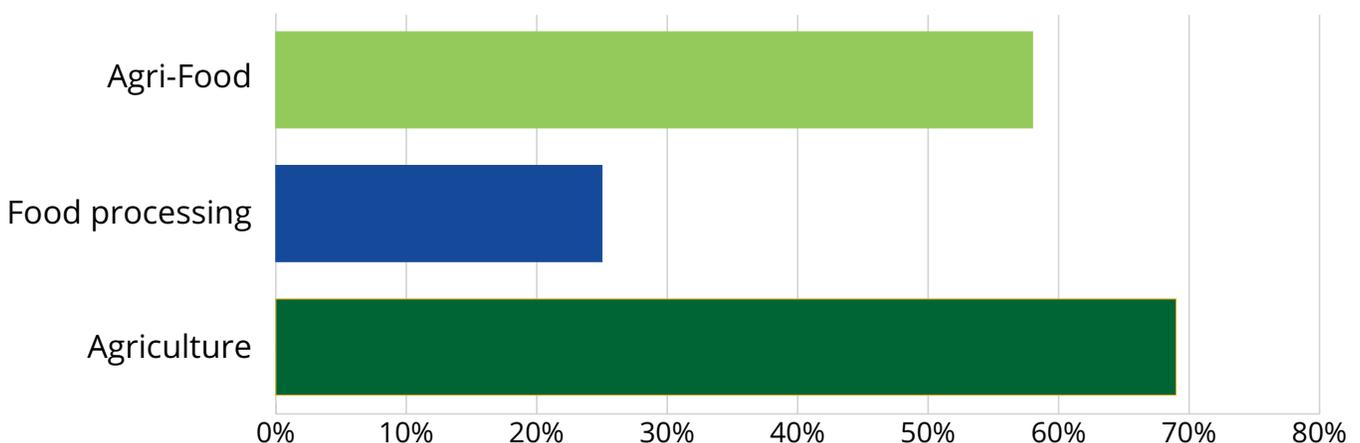
(compared to 14%). These much lower labour force participation rates, particularly for the older cohorts, and the steep declines they exhibit as people age are a clear indication that the workforce in Newfoundland and Labrador retires (or exits the labour force for other reasons) much earlier than is the norm for the Canadian economy. Even accounting for the fact that workers in the agriculture sector tend to retire later than in other industries, we expect the agri-food sector will see 1,154 workers retire between 2017 and 2029. This is equivalent to 58% of the current agri-food workforce, or just under three in five workers. (See Chart 6.)

### Fewer Young Workers Entering Workforce

Fewer young workers leaving school and entering the workforce will be another important factor limiting the sector's labour supply in the future. This is another result of the characteristics of baby boomers. Although they are more

## Chart 6: Retirements Will Impact Agriculture More Severely

(share of 2017 workforce expected to retire by 2029)



Source: Statistics Canada; Canadian Agricultural HR Council.

<sup>6</sup> The participation rate is the number of labour force participants expressed as a percentage of the population 15 years of age and over.

numerous than their parents, they had far fewer children on average. This trend has not subsided with Generation X or the Millennials which have followed, as subsequent generations continue to have fewer children than preceding generations. This creates an imbalanced population pyramid whereby a wave of boomer retirements will exit the labour force but far fewer younger workers will be coming of age in the future.

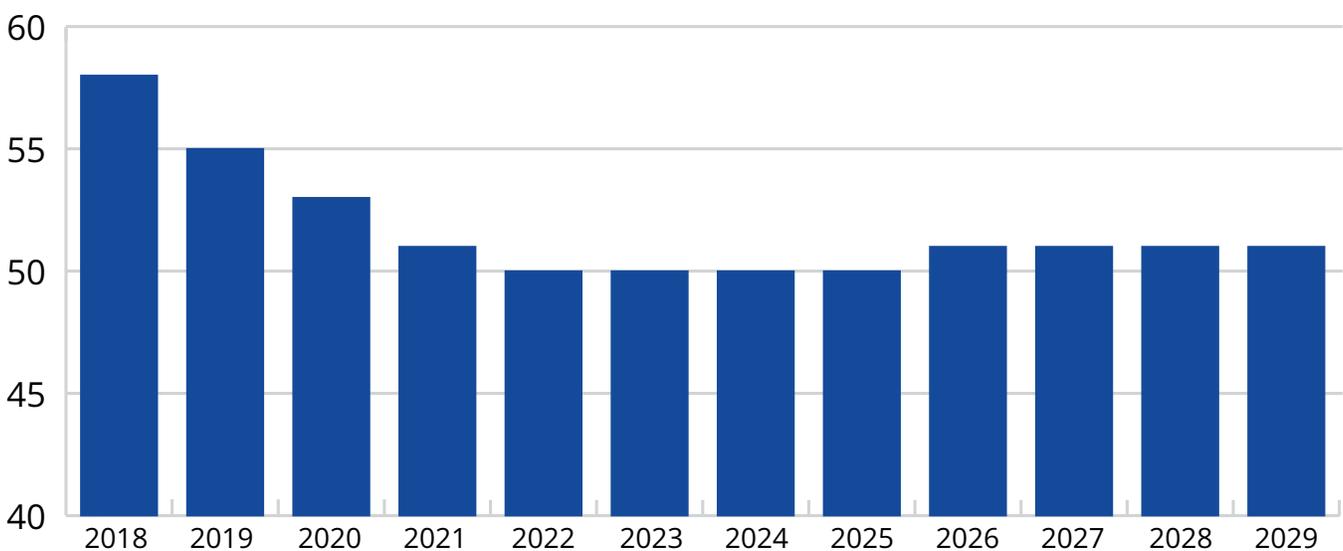
As a direct result of this trend, the provincial population between 15 to 24 years (and will therefore enter the labour force in earnest over the next decade) is expected to decline noticeably in the five years, falling from a high of 56,300 in 2018 to about 49,900 in 2023 before leveling off in the remaining years of the forecast. The share of this young cohort relative to total population in Newfoundland and Labrador will fall from 10.7% in 2018 to just 9.9% by 2029.

The result will be fewer people leaving school and looking for work than the province has become accustomed to.

While this is a demographic trend that will impact all sectors of the economy, agri-food faces an additional challenge in that the share of young people entering the sector’s workforce has been steadily declining independently of any reduction in the size of this cohort. As a result, policies designed to improve the attractiveness of career options in the agri-food sector to younger workers could help mitigate the impact of a shrinking workforce generally. Nevertheless, the baseline scenario expects just over 600 young workers to join the agri-food workforce between 2018 and 2029. That is approximately 140 fewer young workers than the sector saw join the workforce between 2006 and 2017. (See Chart 7.)

### Chart 7: Number of Young Workers Entering Newfoundland and Labrador’s Agri-Food Sector Will Fall Steadily in Next 5 Years

(number of 15 to 24-year-old workers entering agri-food employment)



Source: Statistics Canada; Canadian Agricultural HR Council.

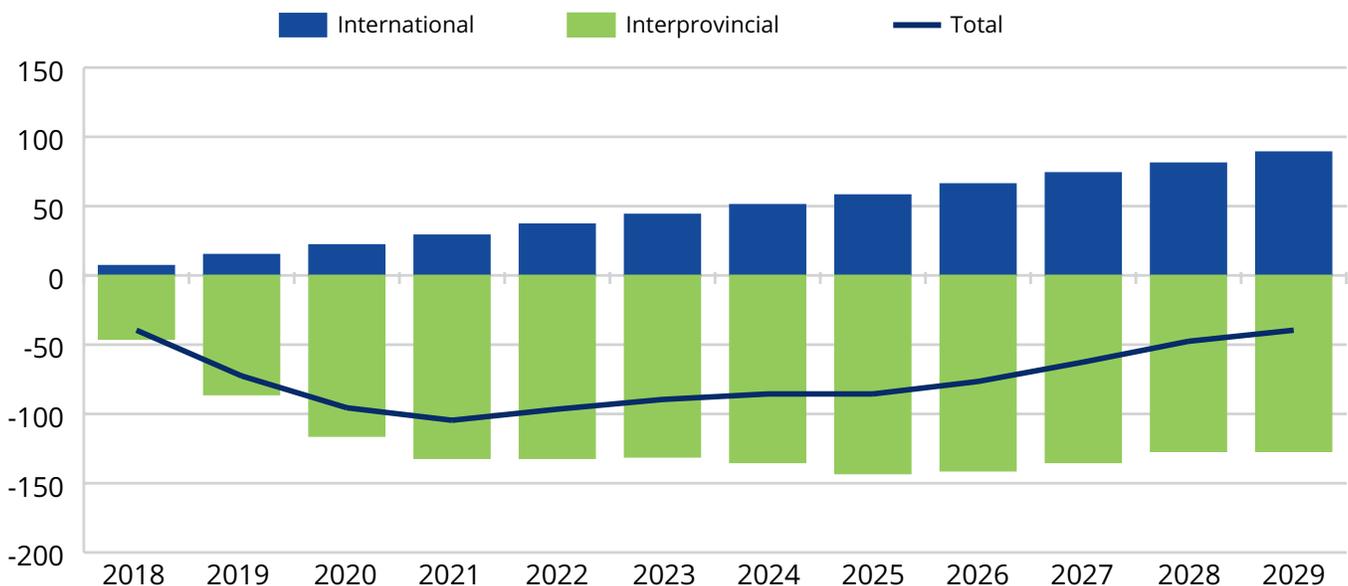
## Agri-Food Sector Faces Out-Migration

Out-migration represents another key factor that will weigh on agri-food’s labour supply in the years to come. Over the past decade, immigration has been a large source of growth for the Newfoundland and Labrador population, with the province as a whole enjoying a net annual inflow of 830 migrants.<sup>7</sup> Unfortunately, immigration will no longer be a source of population growth for the province in the future. Indeed, between 2018 and 2029, total net interprovincial migration will register a loss of over 1,400 people annually. This is expected to be offset nearly equally by inflows of international migrants, but in aggregate, the province will not enjoy the same increase in population that it has in recent years due to immigration.

Weaker net inflows of migrants in the future impacts the province’s agri-food sector in several ways. For one, slower natural population growth combined with weaker immigration rates will naturally result in slower labour force growth in the future than in the past. However, demand for labour is not projected to subside and, as a result, competition for workers in the future will be fierce across all industries. This fact alone presents a challenge for agri-food employers where working conditions are often difficult, pay can be lower than average, and operations may be rural. Secondly, international immigrants coming to Canada have been less likely to choose a career in agri-food relative to other sectors. These factors combined are expected to result in the province’s agri-food sector losing a net 40 workers by 2029. (See Chart 8.)

### Chart 8: Agri-Food Sector Faces Net Out-Migration

(cumulative net migration into the agri-food workforce by category)



Source: Statistics Canada; Canadian Agricultural HR Council.

<sup>7</sup> This includes interprovincial as well as international migrants.

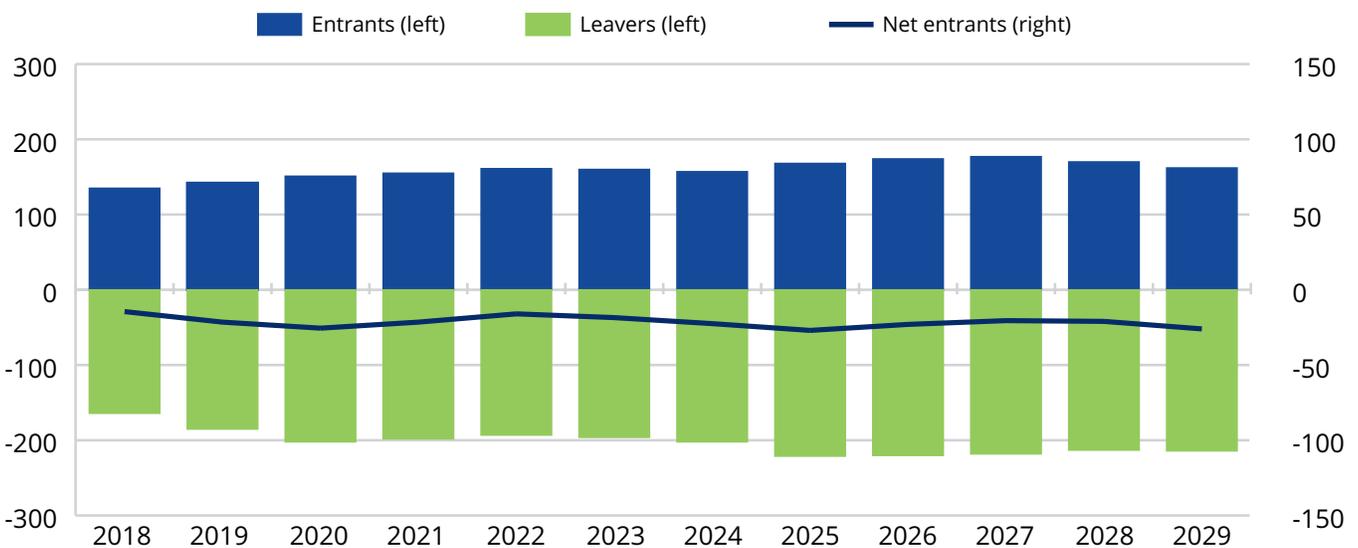
## Agri-Food Workforce Set to Shrink

Retirements, out-migration (both provincial and international), and people choosing to leave the agri-food workforce to work in other sectors, mean that the agri-food sector will see 200 labour force exits per year between 2018 and 2019. This will more than offset the expected annual inflow of 160 entrants stemming from young people entering the workforce, immigrants

(both provincial and international), and people who choose to enter the agri-food workforce from other industries within the province. (See Chart 9.) The combination of these trends means that the domestic labour supply will contract by an average of 40 people per year, falling from 1,980 workers in 2017 to 1,460 in 2029. (See Chart 10 on next page.)

## Chart 9: Labour Force Leavers to Outnumber Entrants

(labour supply by category)



Source: Canadian Agricultural HR Council.

## 5.2 Trends Impacting Labour Demand

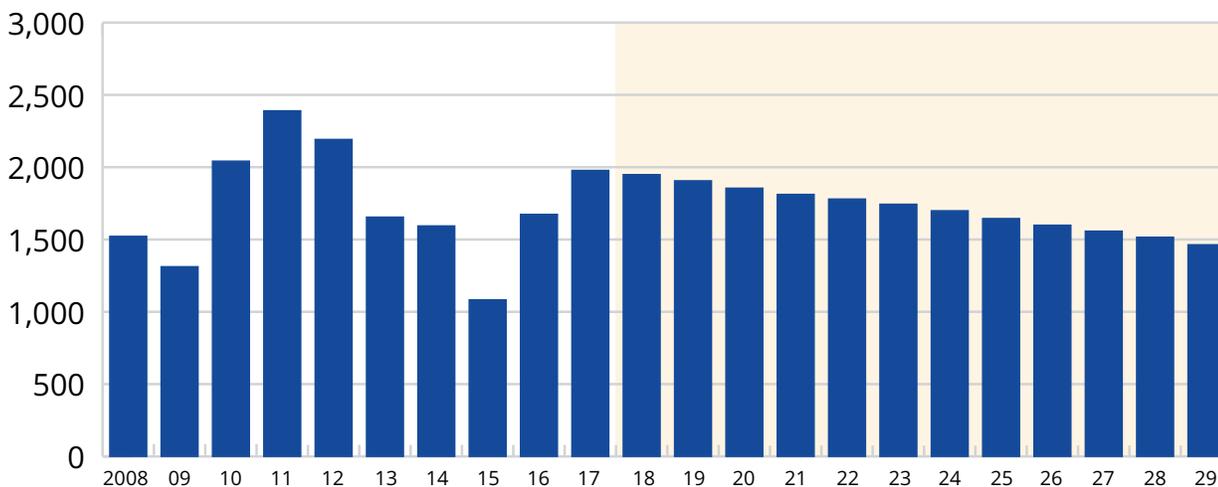
Over the past 10 years, labour demand in the agri-food sector has steadily increased. We expect this trend to continue over the forecast, with labour demand expected to grow by an average of 0.2% to 2.9% per year depending on the forecast scenario.

## Production Gains to Drive Rising Labour Demand

Increased demand for workers will be driven by the potential of the agri-food sector to increase production in response to rising market demand for its products. Market demand, in turn, is influenced by several factors including domestic demand for food, global demand for food, the exchange rate, the trade environment and market access, and regulatory frameworks. As a part of this project, we established three

## Chart 10: Newfoundland and Labrador's Agri-Food Labour Force Set to Shrink

(labour supply by category)



Source: Statistics Canada; Canadian Agricultural HR Council.

separate growth scenarios for production which are outlined below.

### ➔ **Baseline Scenario – Low**

Future production growth by commodity in Newfoundland and Labrador grows at the baseline rates established in the 2018 Canadian Agricultural Human Resource Council (CAHRC) labour market forecast. Aggregate agricultural production rates in Newfoundland and Labrador differ relative to other provinces based on the different mix of farm production that exists in the province. In this scenario, agricultural production volumes are forecast to grow by 1.4% per year over the forecast (see Chart 11.), which is below its historic trajectory and reflects the general slowdown in

agricultural production nation-wide which is expected in CAHRC's baseline outlook. Crop production expands by 2.2% a year on average while livestock increases by 1.2% on average. Under these assumptions, price-adjusted sales are forecast to increase from \$149 million (in 2007 dollars) in 2017 to \$175 million by 2029.<sup>8</sup> (See Table 1.)

### ➔ **Alternate Scenario I – Medium**

The slowdown in agricultural production that is anticipated in the baseline forecast does not occur and average production growth is closer to 3% a year over the forecast. This is roughly in line with the province's performance of the last 10 years, where crop production grew by an average of 3.4% and livestock production by 3.1% a

<sup>8</sup> Price-adjusted production values for the primary agriculture sector are taken by deflating nominal sales by commodity, with the respective price for that commodity, which can be found in CANSIM table 32-10-0098-01. This result is revenues in constant dollar prices (2007 = 1.0) which allows production volumes to be compared across industries independent of the production mix. However, this research does not involve a forecast of future commodity prices and therefore, projections for sales by commodity in current dollars are not readily available.

year. In this scenario, price-adjusted sales are expected to rise to \$209 million<sup>9</sup> (in 2007 dollars) by 2029.

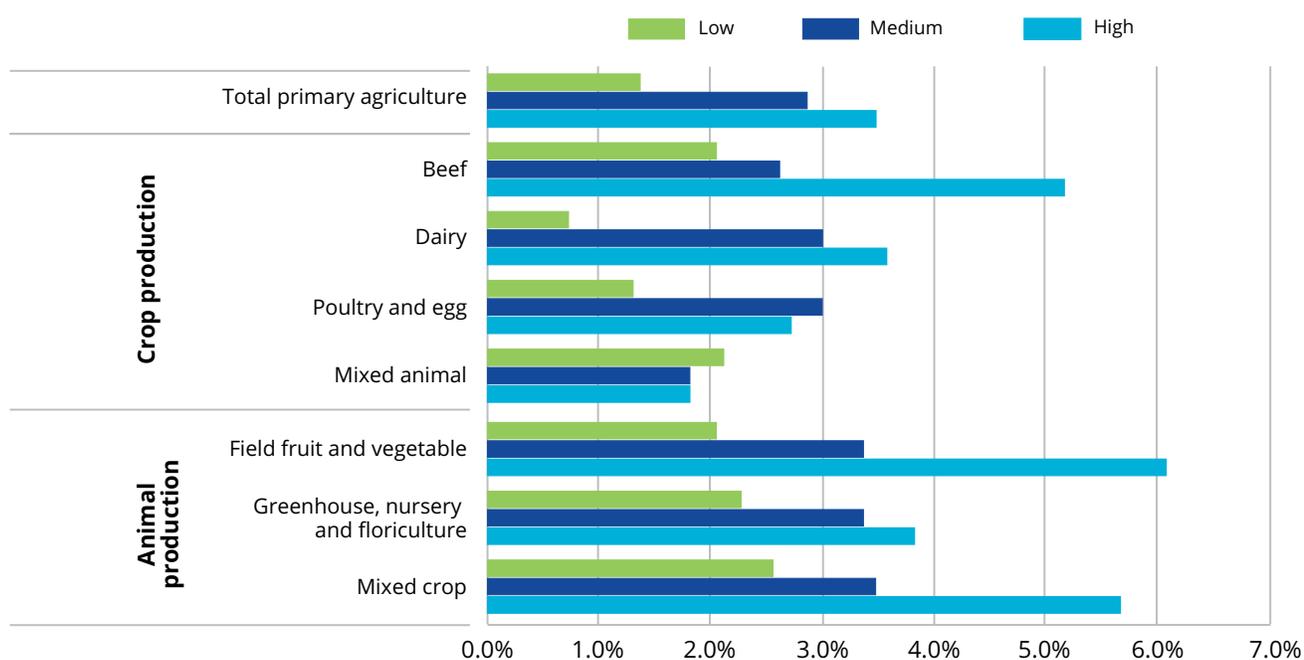
### ▶ **Alternate Scenario II – High**

For 2009, Agriculture and Agri-Food Canada estimated that 29% of all the agriculture and food products that were sold in Newfoundland and Labrador were purchased from Newfoundland and Labrador producers and processors.<sup>10</sup>

According to the most recent available data from Statistics Canada’s supply-use tables<sup>11</sup>, we find that Newfoundland and Labrador has seen its food self-sufficiency<sup>12</sup> decline to 24% in 2015. (See Chart 12.) This decline in domestic market share has largely come at the expense of international food imports, which now account for 35% of food sold in Newfoundland and Labrador, up from 21% in 2010.

## Chart 11: Production Assumptions

(average annual percentage change in production volumes, 2018-2029)



Source: Canadian Agricultural HR Council.

<sup>9</sup> All subsequent references to price-adjusted production or revenues are in 2007 constant dollars. were purchased from Newfoundland and Labrador producers and processors.

<sup>10</sup> Agriculture and Agri-Food Canada, Newfoundland and Labrador’s Agriculture Industry (2014). [http://publications.gc.ca/collections/collection\\_2016/aac-aafc/A22-12230-2014-eng.pdf](http://publications.gc.ca/collections/collection_2016/aac-aafc/A22-12230-2014-eng.pdf)

<sup>11</sup> Statistics Canada. Table 36-10-0478-01.

<sup>12</sup> We define food self-sufficiency for Newfoundland and Labrador as the share of agri-food products that were sold in the province that were purchased from Newfoundland and Labrador producers and processors. Put differently, it is the share of agri-food sales within the province that were not imported.

**Table 1: Price-Adjusted Sales Outlook**

(price-adjusted sales by industry in 2029, \$2007 millions)

Sector/Industry	Current (2017)	Forecast scenario (2029)		
		Low	Medium	High
Total primary agriculture	148.7	175.4	208.8	224.0
Crop production	28.4	36.9	42.3	50.2
Field fruit and vegetable	9.8	12.5	14.6	19.9
Greenhouse, nursery, and floriculture	15.2	19.9	22.6	23.8
Mixed crop	3.4	4.5	5.1	6.5
Animal production	120.4	138.5	166.6	173.8
Beef	2.5	3.2	3.5	4.6
Dairy	71.0	77.5	101.0	108.0
Poultry and egg	21.5	25.2	30.7	29.7
Mixed animal	25.3	32.6	31.4	31.4

Source: Statistics Canada; Canadian Agricultural HR Council.

In this scenario, Newfoundland and Labrador would look to regain some of the market share it has lost at home in specific commodities and boost provincial food self-sufficiency. This scenario does not include any assumptions that the province starts to produce commodities that it has not in the past or cannot due to climate or other inherent characteristics. Rather, this analysis focuses on commodities where imports (either international or interprovincial) have increased rapidly in recent history relative to domestic production and represent an opportunity for domestic producers to increase their market share. This is in line with Newfoundland and Labrador's Agriculture Sector Work Plan that includes several initiatives such as large-scale land development/redevelopment of historic pasture lands, providing fruit and vegetable seedlings at cost for priority crops, improving Crown Land approval processes,

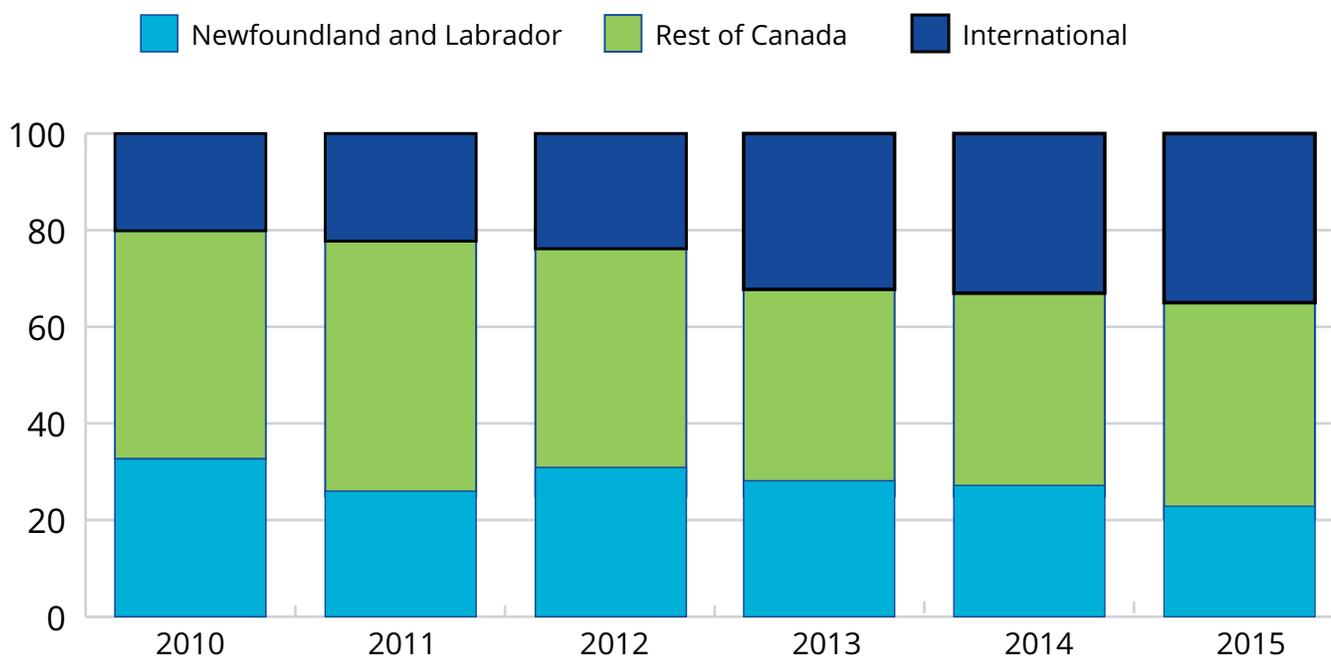
enabling commercial egg production, providing abattoir services, and supporting export development opportunities in niche commodities (e.g. partridgeberries/lingonberries). In this scenario, agricultural production is forecast to grow by 3.5% per year over the forecast, with price-adjusted sales expected to rise to \$224 million by 2029. Crop production would grow by 4.9% per year versus 3.1% for livestock.

### Agricultural Productivity Growth Set to Slow

Strong productivity gains (measured by how much output each worker is able to produce) have been a key part of Newfoundland and Labrador's agriculture sector for many years. Thanks to mechanization, better seeds, improved fertilizers, and new farming techniques, farms have been able to produce more products with fewer workers. For example, in 2002, there were about 1,400 agriculture workers in Newfoundland

## Chart 12: Imports Account for a Rising Share of Food Sold in Newfoundland and Labrador

(source of Newfoundland and Labrador's agriculture and agri-food products, per cent)



Source: Statistics Canada; The Conference Board of Canada.

and Labrador (including those employed in aquaculture). In 2017, the workforce had grown to over 2,000 people including foreign workers, which is a 45% increase. Over the same period, agricultural production more than doubled, implying that output per worker has increased by about 40% in the last 15 years.

While we continue to expect strong improvements in agricultural productivity over the forecast period, the rate of mechanization will decrease compared to previous years. This is because today's farms are already much more capital intensive than they were 20 years ago. As a result, the potential gains from increasing mechanization have become increasingly more marginal. Overall, we anticipate output per worker will grow by an average of 1.6% per year

between 2018 and 2029, below its pace of 2.7% over the previous 15 years.

### Farm Consolidation Influencing Workforce Composition

Over the last two decades, the agriculture sector has consolidated rapidly, as many small farms have merged into larger entities. Consolidation of farms has been an important factor driving productivity gains. Larger farms have greater revenues, and thus have greater access to the capital required to invest in productivity-enhancing equipment and machinery. As a result, they are more productive, requiring fewer workers to achieve the same level of production. Consolidation has also influenced how work is carried out in the sector and its occupational

makeup; for example, it has resulted in a shift toward fewer owner/operators and more paid workers.

With farm consolidation expected to continue over the forecast period, albeit at a more modest pace, owner/operators will account for a steadily shrinking share of employment in the sector. This is apparent when we examine the share of the sector's employment that is in the 'manager in agriculture' occupation, which includes owner/operators. The share of labour demand represented by 'managers in agriculture' declined from a high of 23.8% in 2001 to 22.7% of the total labour demand in 2017. That share is expected to decline a further 1% to 2% between now and 2029 depending on the forecast scenario. In addition, we expect that the contribution of unpaid workers (typically family members) will become less significant and that a larger share of the workforce will be paid workers, reflecting the trend towards larger and more professional farms.

### Agri-Food Labour Demand Set to Grow

By design, assumptions for future productivity growth are held constant across the three different production scenarios. For example, Newfoundland and Labrador's beef industry is expected to see production grow by an annual average of 2.0% (low), 2.6% (medium), and 5.1% (high) between 2018 and 2029. At the same time, labour productivity is forecast to average annual gains of 1.2% across all three scenarios. The result is that the beef industry will see labour demand grow by a respective 0.8% (low), 1.4% (medium), and 3.9% (high), over the forecast. (See Table 2.) This allows for a more straightforward analysis of how different production trajectories, in different agricultural industries, will impact future labour requirements in the province's agri-food sector.

Labour demand in each food processing industry is explicitly linked to its primary agriculture counterparts. For example, labour demand in dairy product manufacturing is modeled to grow at the same rate as labour demand in dairy production. This assumption reflects the desire for the province to increase the share of domestic primary production which is processed in the province and bolster its food self-sufficiency over the next five to ten years. This will not be achieved unless the incremental primary production is processed in the province and subsequently marketed through provincial retailers to consumers.

In aggregate, labour demand growth between 2018 and 2029 ranges from a low of 0.2% per year in the baseline scenario (where higher production is driven almost entirely by productivity gains) to a high of 2.9% per year in the high growth scenario (where despite robust productivity growth, production growth is expected to be sufficiently strong to drive a marked increase in the number of workers required). Put differently, Newfoundland and Labrador's agri-food sector would see labour demand increase by between 4 and 61 people on average each year, rising from 1,805 workers in 2017 to between 1,857 and 2,540 workers in 2029. (See Chart 13.)

## 5.3 Labour Deficit on the Horizon

A key objective of this project is to inform stakeholders about how Newfoundland and Labrador's agri-food labour market could evolve over the next decade and specifically, how the current balance between labour demand and domestic supply could evolve based on different assumptions. Currently, the agri-food sector enjoys a surplus of roughly 170 people. However,

## Table 2: Labour Demand Forecast by Sector and Industry

(average annual percentage change in labour demand by scenario, 2018-2029)

Sector/Industry	Forecast scenario (2029)		
	Low	Medium	High
Total agri-food	0.2%	1.5%	2.9%
Total primary agriculture	0.3%	1.5%	2.8%
Field fruit and vegetable	0.6%	1.7%	5.9%
Greenhouse, nursery, and floriculture	0.7%	1.8%	2.2%
Mixed crop	0.7%	1.6%	3.8%
Beef	0.8%	1.4%	3.9%
Dairy	-0.8%	1.4%	2.0%
Poultry and egg	0.2%	1.9%	1.6%
Mixed animal	0.3%	0.0%	0.0%
Total food processing	0.2%	1.4%	3.2%
Dairy	0.4%	1.9%	3.7%
Fruit and vegetable	-0.8%	1.4%	2.0%
Meat	0.8%	1.4%	3.9%

Source: Canadian Agricultural HR Council.

- Low:** Production is forecast to grow by 1.3%/yr. over the forecast. Crop production expands by 2.2%/yr. and livestock increases by 1.2%/yr.
- Medium:** Production is forecast to grow by 3%/yr. over the forecast. Crop production expands by 3.4%/yr. and livestock increases by 3.1%/yr.
- High:** Production is forecast to grow by 4.4%/yr. over the forecast. Crop production expands by 4.9%/yr. and livestock increases by 3.1%/yr.

the forecasts suggest that a shortage of workers is looming. A deficit of available domestic labour is expected to emerge between 2020 and 2022 depending on the scenario. (See Chart 14.) What is more, by 2029, the number of domestic workers available to the agri-food sector falls short of labour requirements regardless of scenario. At that time, the industry will be facing a shortage of between 390 to 1,100 workers which is equivalent to between 21% and 42% of labour demand respectively.

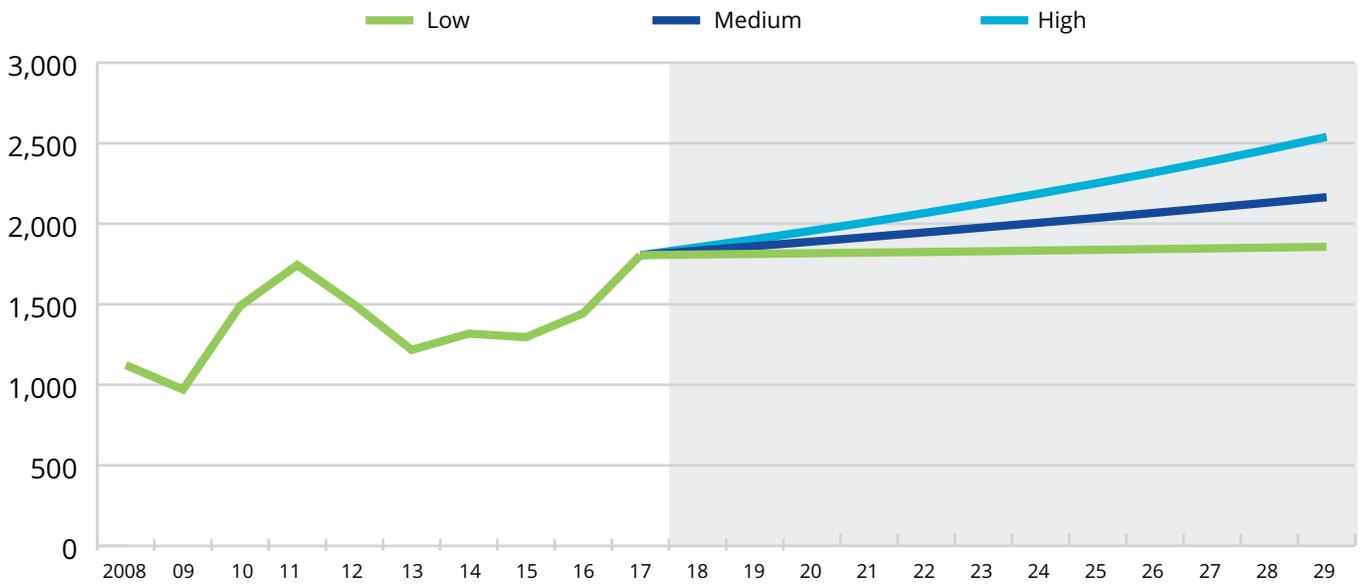
Production varies by commodity in the three scenarios, and labour supply is also uniquely

determined for each occupation and industry. As a result, the future pressures resulting from labour shortages will not be evenly distributed across the sector. Currently, both primary agriculture and food processing enjoy an almost identical surplus of 85 workers. However, by 2029, the projected labour deficit will be concentrated in primary agriculture, particularly so in dairy and horticulture.<sup>13</sup> (See Table 3.) In large part, this reflects the much poorer demographic realities inherent to primary production in the province. Agricultural industries (which are older than average) will experience a greater outflow of workers due to retirement

<sup>13</sup> Horticulture includes field fruit and vegetable, and greenhouse.

### Chart 13: Robust Production Outlook Driving Demand for Workers

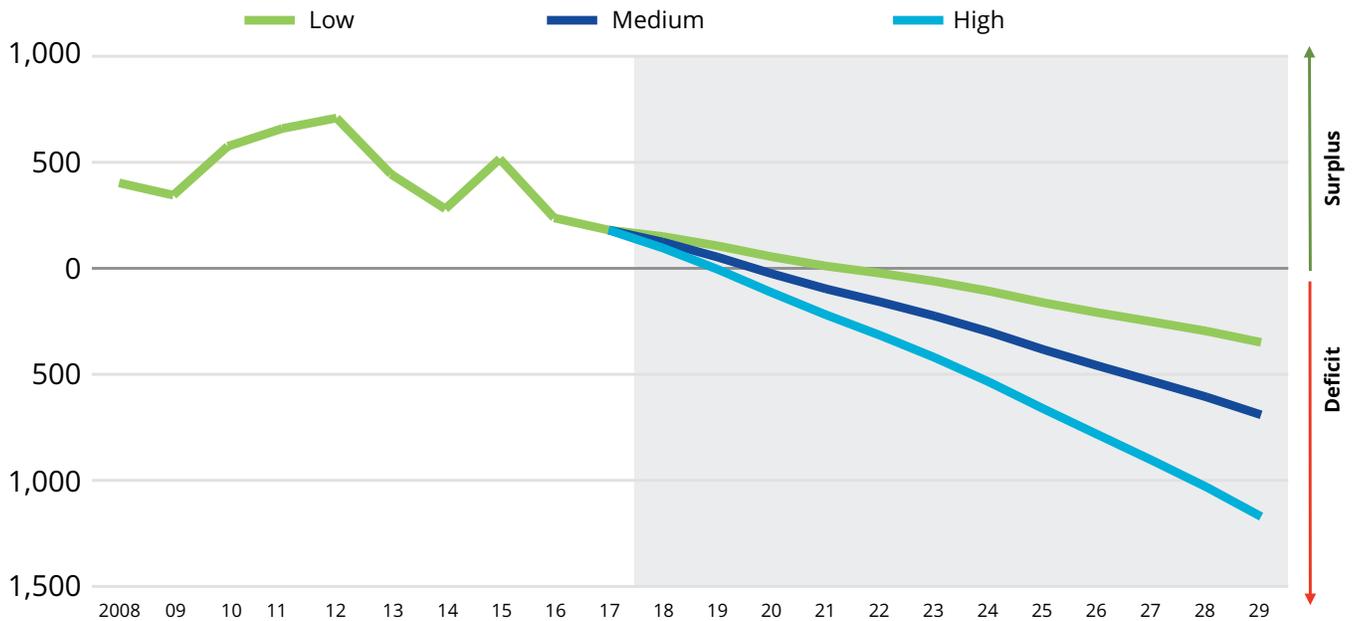
(agri-food labour demand, by scenario)



Source: Statistics Canada; Canadian Agricultural HR Council.

### Chart 14: Labour Surplus to Become Deficit

(agri-food labour gap, by scenario)



Source: Statistics Canada; Canadian Agricultural HR Council.

### Table 3: Labour Deficit to be Concentrated in Primary Agriculture

(labour deficit/surplus\* by industry in 2029)

Sector/Industry	Current (2017)	Forecast scenario		
		Low	Medium	High
Total agri-food	173	-393	-701	-1,075
Total primary agriculture	88	-429	-671	-938
Field fruit and vegetable	-13	-111	-154	-349
Greenhouse, nursery, and floriculture	-18	-92	-121	-135
Mixed crop	186	71	53	3
Beef	-7	-38	-43	-68
Dairy	-32	-79	-157	-181
Poultry and egg	-4	-72	-118	-110
Mixed animal	-25	-109	-134	-99
Total food manufacturing	86	36	-30	-137
Dairy	17	15	12	7
Fruit and vegetable	26	24	-22	-36
Meat	42	-2	-20	-108

\*negative value indicates labour deficit

Source: Statistics Canada; Canadian Agricultural HR Council.

**Low:** Production is forecast to grow by 1.3%/yr. over the forecast. Crop production expands by 2.2%/yr. and livestock increases by 1.2%/yr.

**Medium:** Production is forecast to grow by 3%/yr. over the forecast. Crop production expands by 3.4%/yr. and livestock increases by 3.1%/yr.

**High:** Production is forecast to grow by 4.4%/yr. over the forecast. Crop production expands by 4.9%/yr. and livestock increases by 3.1%/yr.

relative to food processing industries (which are younger than average), ultimately resulting in a much sharper contraction in domestic labour supply. Altogether, primary agriculture faces a labour shortage of between 430 workers and 940 workers by forecast end — equivalent to a respective 30% and 48% of labour demand in 2029. Food processing, on the other hand, will remain in a surplus position in the baseline scenario, and would only experience mild shortages of between 30 and 140 workers in the medium- and high-growth scenarios, or 6% and 24% of labour demand at the end of the

forecast. Impending labour market pressures will also differ by occupation, which is not surprising given the different outcomes by commodity and industry segment. While some occupations are at risk of greater retirements, others are able to attract more young workers. The gap is the result of the changes in demand for each occupation (driven by the market conditions) and the supply changes (driven by the various demographic factors). By evaluating labour demand and supply for each occupation independently, we can determine where shortages are likely to be the most acute in the future. (See Table 4.)

## Table 4: General Farm Workers and Managers in Agriculture Account for Most of the Labour Gap

(labour deficit/surplus\* by occupation in 2029)

Occupation	Current (2017)	Forecast scenario		
		Low	Medium	High
Total occupations	173	-393	-701	-1,075
Management occupations	-29	-134	-213	-258
Senior managers	0	0	-1	-1
Managers in horticulture	-30	-117	-189	-229
Managers in agriculture	0	-17	-23	-28
Occupations in primary agriculture	114	-278	-432	-647
Agricultural service contractors	-17	-48	-65	-61
General farm workers	118	-152	-259	-379
Nursery and greenhouse workers	-2	-35	-47	-55
Harvesting labourers	16	-35	-51	-141
Other	-1	-8	-11	-12
Occupations in food processing	86	35	-32	-140
Testers and graders	18	9	-2	-16
Industrial butchers and meat cutters	6	-5	-21	-44
Process control and machine operators	4	-6	-11	-34
Labourers in food processing	57	36	1	-46
Other occupations	3	-16	-24	-30
Heavy-duty equipment mechanics	-1	-5	-7	-9
Transport truck drivers	-1	-7	-10	-12
All other	6	-4	-7	-10

\*negative value indicates labour deficit

Source: Statistics Canada; Canadian Agricultural HR Council.

- Low:** Production is forecast to grow by 1.3%/yr. over the forecast. Crop production expands by 2.2%/yr. and livestock increases by 1.2%/yr.
- Medium:** Production is forecast to grow by 3%/yr. over the forecast. Crop production expands by 3.4%/yr. and livestock increases by 3.1%/yr.
- High:** Production is forecast to grow by 4.4%/yr. over the forecast. Crop production expands by 4.9%/yr. and livestock increases by 3.1%/yr.

'General farm workers' and 'farm managers' – will experience the most significant labour shortages in the future. By 2029, the agri-food sector will require between 150 and 380 more of these positions than will be available. Farm managers, on the other hand, are already in a deficit position. And despite the fact that demand for these positions will be weaker than in the past due to ongoing farm consolidation, the decline in available supply will drive the shortage to between 115 and 230 positions by forecast end. Combined, these two occupations will account for an average of 63% of the agri-food labour gap in 2029, well above their current 54% share of the workforce.

Other occupations that are most likely to see their labour gaps widen that are also key to primary agriculture and include harvesting labourers, agricultural service contractors, and nursery and greenhouse workers. In food processing, shortages will be most apparent for process control and machine operators, industrial butchers and meat cutters.

Another way to analyze the outlook for each occupation is by looking at the gap relative to labour demand, and how this metric is expected to change over time. This allows for a comparison of the severity of future labour shortages across occupations independent of the number of people employed. For example, the labour gap-to-demand ratio for agricultural service contractors is highest, rising from 16% in 2017 to an average of 49% across forecast scenarios in 2029. (See Table 5.) In other words, slightly less than half of the potential future jobs in this occupation are at risk of going unfilled due to a lack of available domestic workers.

In general, most primary agriculture occupations are already in a deficit position, and these imbalances will grow over the next ten years unless action is taken. For example, the labour gap-to-demand ratio for 'managers in agriculture' is expected to rise from 9% in 2017 to somewhere between 37% and 54% by 2029. Nursery and greenhouse workers, which are also already in a deficit position, will see its labour shortage relative to demand climb from 3% in 2017 to between 39% and 51% by forecast end. Thus, to ensure that the province is able to achieve its goal of boosting primary production and food self-sufficiency in the province, industry must look for innovative solutions to attract more workers to the sector or improve productivity to mitigate the shortage.

Unlike primary agriculture, where shortages are the norm, most processing occupations are currently in surplus, or labour demand and supply are well balanced. However, on the back of strong production growth these surpluses will shrink and, in some cases, revert into a deficit. For example, there is currently a small surplus of 7% relative to labour demand for 'industrial meat cutters and butchers' in the province. However, as both primary beef and meat product manufacturing are expected to experience robust growth in the future, there will be a deficit of between 10% and 37% by 2029 depending on the scenario. A similar future exists for 'process control and machine operators'. But not all occupations face the same outlooks, for example the 'testers and graders' and 'food processing labourers' occupations would only experience a sizeable deficit relative to demand in the high growth scenario.

## Table 5: Labour Pressures Vary by Occupation

(labour gap\* as a share of demand by occupation in 2029)

Occupation	Current (2017)	Forecast scenario		
		Low	Medium	High
Total occupations	10%	-21%	-32%	-42%
Management occupations	-8%	-37%	-48%	-53%
Senior managers	-10%	-41%	-49%	-56%
Managers in horticulture	-9%	-37%	-49%	-54%
Managers in agriculture	1%	-37%	-44%	-49%
Occupations in primary agriculture	12%	-27%	-36%	-46%
Agricultural service contractors	-16%	-44%	-52%	-50%
General farm workers	18%	-22%	-33%	-42%
Nursery and greenhouse workers	-3%	-39%	-46%	-50%
Harvesting labourers	14%	-28%	-36%	-60%
Other	-6%	-41%	-48%	-51%
Occupations in food processing	21%	6%	-9%	-25%
Testers and graders	31%	15%	-2%	-19%
Industrial butchers and meat cutters	7%	-5%	-19%	-33%
Process control and machine operators	7%	-10%	-16%	-37%
Labourers in food processing	29%	19%	1%	-17%
Other occupations	6%	-30%	-39%	-45%
Heavy-duty equipment mechanics	-8%	-40%	-47%	-52%
Transport truck drivers	-8%	-40%	-47%	-52%
All other	28%	-17%	-28%	-36%

\* negative numbers indicate labour shortage

Source: Statistics Canada; Canadian Agricultural HR Council.

**Low:** Production is forecast to grow by 1.3%/yr. over the forecast. Crop production expands by 2.2%/yr. and livestock increases by 1.2%/yr.

**Medium:** Production is forecast to grow by 3%/yr. over the forecast. Crop production expands by 3.4%/yr. and livestock increases by 3.1%/yr.

**High:** Production is forecast to grow by 4.4%/yr. over the forecast. Crop production expands by 4.9%/yr. and livestock increases by 3.1%/yr.

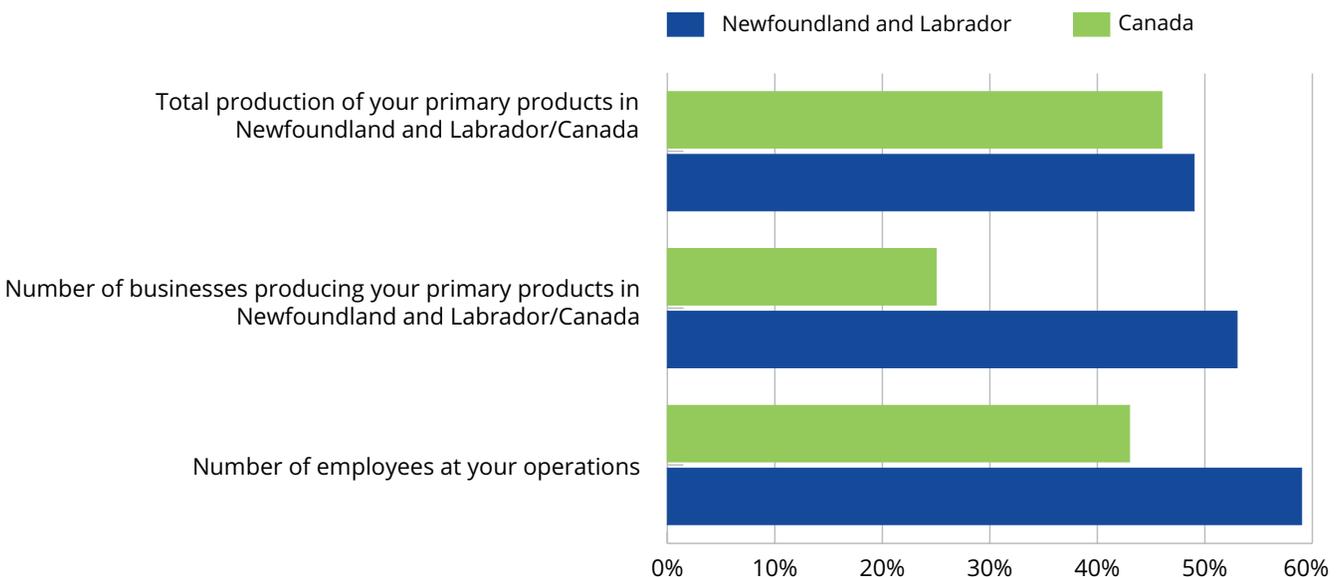
## 6. Realizing Agri-Food's Production Potential

The Provincial Government and the Newfoundland and Labrador Federation of Agriculture have developed an Agriculture Sector Work Plan whose objectives include increasing the province's food self-sufficiency and growing secondary processing of food products (particularly industrial milk, industrial eggs, cranberries, fruit and vegetables and meat). Against this backdrop, it may come as little surprise that agri-food operators in Newfoundland and Labrador have a bullish outlook for production in the province. For example, three in five operators in CAHRC's employer survey expect production of their

primary products in Newfoundland and Labrador will increase over the next five years compared to only 43% of employers across Canada. (See Chart 15.) At the same time, over half of respondents expect an increase in the numbers of businesses producing their primary products in the province over the coming five years — double the national average. However, for the province to achieve its stated goals, the sector will need to find ways to address the labour challenges we have identified in this report. If production rates are to reach their ultimate potential, labour requirements will inevitably increase— an outlook which is supported by

### Chart 15: Newfoundland and Labrador Operators More Expectant of Production Growth for Their Primary Products

(share of employers who expect increase the next five years, by category)



Based on surveys of a respective 35 and 1,245 respondents

Source: Newfoundland and Labrador Federation of Agriculture Employer Survey; Canadian Agricultural Human Resource Council Employer Survey.

the results from the employer survey which found that 49% of agri-food operators expect employment to increase at their operation in the next five years, which is more than 3 times as many (14%) who expect employment to contract. At the same time, the supply of workers available to work in the sector will continue to shrink due to mounting retirements and sustained out-migration from the province. We anticipate that the resulting gap between the number of workers which are required and the number available to work in Newfoundland and Labrador's agri-food sector will widen to somewhere between 390 and 1,100 workers by 2029. This imbalance must be addressed if the sector hopes to realize its potential and the remainder of this chapter outlines several ways that would help the sector manage its growing labour gap.

## 6.1 Finding New Entrants

Given the expected growth in the agri-food labour gap in the years to come, a key part of any future action will involve increasing the supply of labour available to the sector. One way that this can be done is by finding more new entrants. For example, the sector could tap into underrepresented groups in the province's workforce, including women and Aboriginal workers. The 2016 Census indicates that only 30.1% of employees in Newfoundland and Labrador's agri-food sector were female compared to 50% for all industries in the province. At the same time, 6.2% of employees in the province's agri-food sector identify as aboriginal compared to 8.6% for all industries.

In addition to targeting underrepresented groups, the sector could attract more newcomers through better marketing. In CAHRC's 2018 employer survey, manual labour and low wages were the two most commonly identified barriers to recruitment. (See Chart 16.) It is also worth

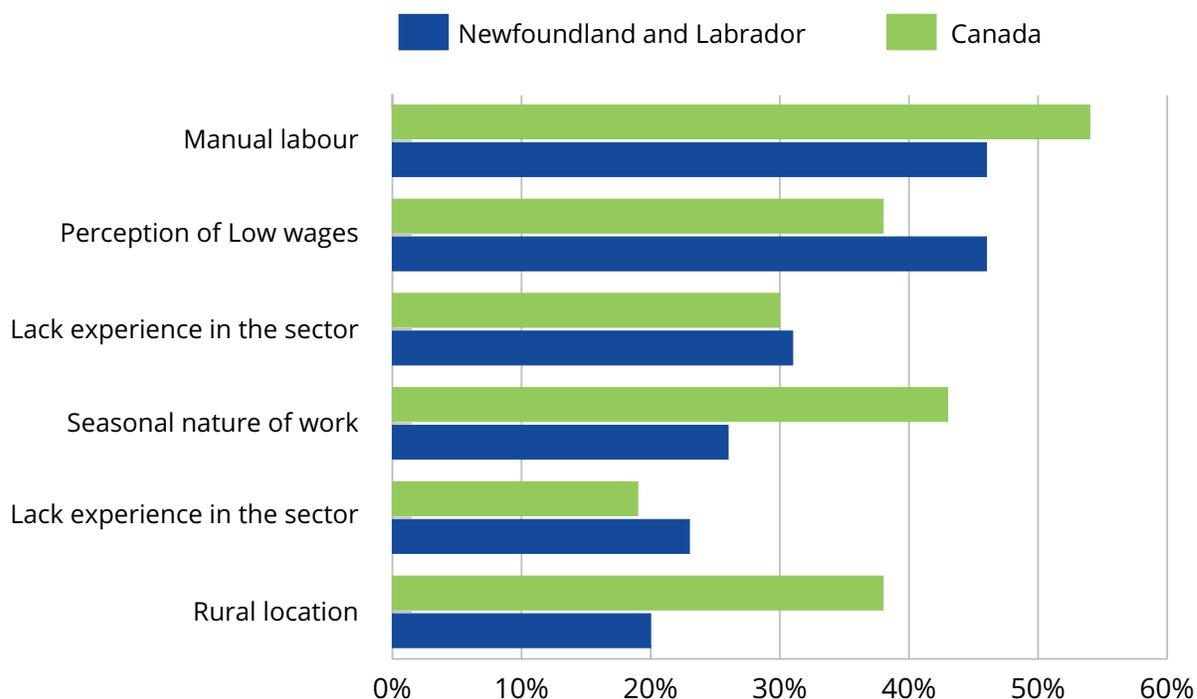
noting that roughly one in four employers highlighted the limited exposure of young people to career opportunities in food production as an impediment to their recruitment efforts. Finding ways to dispel the misconception that jobs in agri-food are limited to manual labour and are all low-paying could lead to improved recruitment outcomes. The sector could also engage with younger cohorts to communicate the variety of career opportunities in the sector and highlight that many of these jobs require advanced skills, familiarizing them at an early age what work on a 21<sup>st</sup> century farm entails.

Beyond better marketing and outreach, the sector should also improve and expand its current recruitment practices. Many producers report that they rely on a variety of recruitment methods, however, the most common method remains word of mouth. In fact, two-thirds of employers used word of mouth to recruit workers in 2018, putting it well ahead of other recruitment methods including social media (28%), online job bank/board (21%), and personal website (10%). Word-of-mouth recruitment is common among small businesses (a description that applies to much of the agri-food sector) but restricting a business's recruiting to word of mouth can limit an employer's potential labour pool to the extent of their personal and professional networks. As such, agri-food employers that wish to attract more Canadians in the future will need to expand their networks to reach the widest possible pool of candidates.

Although, international immigrants coming to Canada have been less likely to choose a career in agri-food relative to other sectors, farm employers in Newfoundland and Labrador could recruit international immigrants who possess specialized skills to help their businesses grow. As well, many newcomers to Canada have farming experience and would welcome the opportunity to start a farm business.

## Chart 16: Key Barriers to Recruitment

(share of employers which selected response)



Based on surveys of a respective 29 and 1,260 respondents

Source: Newfoundland and Labrador Federation of Agriculture Employer Survey; Canadian Agricultural Human Resource Council Employer Survey.

To the extent that the sector is unable to fill forthcoming vacancies with domestic workers, foreign workers could provide a boost to the supply of workers available to work in the sector. While foreign workers remain uncommon in Newfoundland and Labrador's agri-food sector, they still play an important role, helping fill roughly three-quarters of the sector's current shortage of domestic workers. With the sector's labour gap set to widen in the coming years, it will be increasingly important for policymakers to reduce any unessential obstacles that agri-food processors may face in hiring workers from abroad.

## 6.2 Improving Retention

Keeping more of the people who already work in the sector is another way the sector can boost its future supply of workers. For example, the sector grapples with high turnover rates which forces producers to not only hire the additional workers they need to expand their operations, but a greater number of workers simply to replace those who leave. In the survey, employers reported an average voluntary turnover rate of 23% in 2018, which is more than three times the 7.1% average for the Canadian economy in aggregate.<sup>14</sup> An added benefit of improving retention among existing employees is that it limits the time spent by operators hiring and

<sup>14</sup> Heather McAteer, Compensation Planning Outlook 2018 (Ottawa 2017).

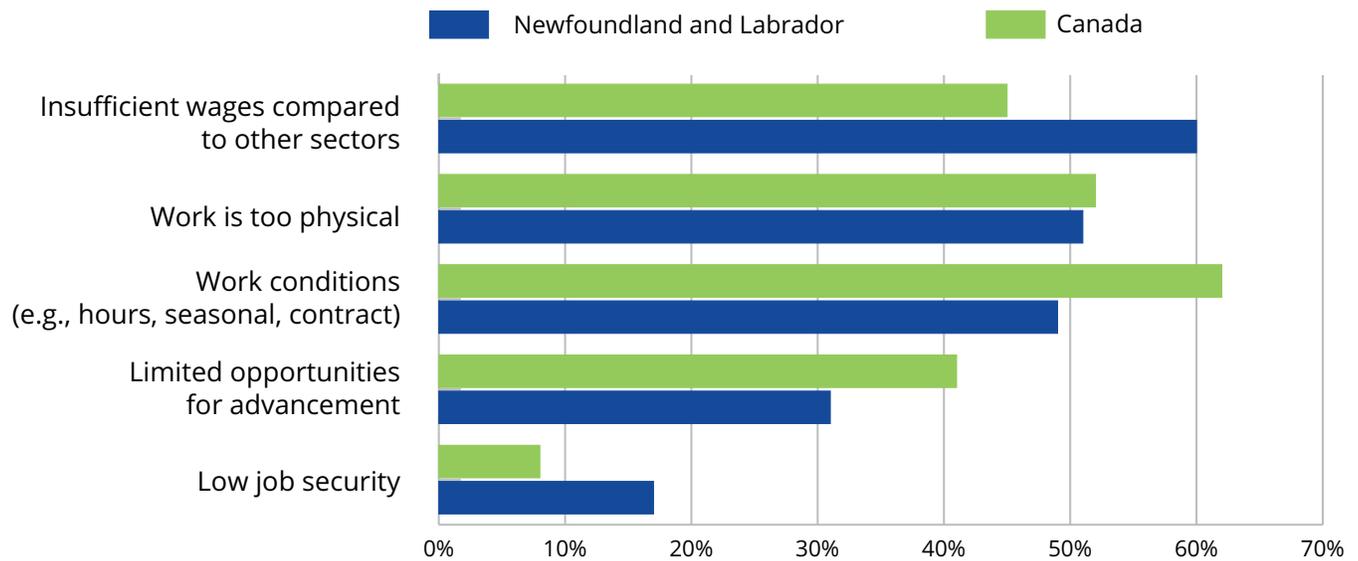
on-boarding new employees which helps to streamline operations and improve productivity.

Low wages are another key barrier to retention for employees. In agriculture, wages are below the Newfoundland and Labrador average, with weekly earnings<sup>15</sup> averaging \$813 in 2018, versus \$984 for all sectors, although the gap has narrowed significantly over time.<sup>16</sup> Manufacturing wages have lagged in recent years and also are somewhat below average. In fact, low wages was the number one reported barrier to retention by employers in the survey at 60% of respondents, which puts it ahead of other known retention challenges like manual labour (51%), work

conditions (e.g. seasonality, 49%), and limited opportunities for advancement (31%). (See Chart 17.) In practice however, the ability of operators to arbitrarily increase pay is difficult because they typically have little-to-no control over how their commodities are priced in the market. As such, employers need to find nonmonetary means to motivate workers to choose to work in agri-food and to stay in the sector once they are there. This may include options such as providing benefits (such as meals, the use of a personal vehicle, on-site housing, free or discounted produce or meat), emphasizing the quality of life that working in the sector offers, and being more flexible with work arrangements. Providing workers with an

### Chart 17: Key Barriers to Retention

(share of employers which selected response)



Based on surveys of a respective 29 and 1,257 respondents

Source: Newfoundland and Labrador Federation of Agriculture Employer Survey; Canadian Agricultural Human Resource Council Employer Survey.

<sup>15</sup> Weighted by employment.

<sup>16</sup> See CANSIM table 14-10-0064-01.

opportunity to develop an ownership stake can also improve an employer's relative attractiveness and improve retention.

Retaining potential retirees by offering flexible work arrangements is another way the agri-food sector can improve its labour supply. As noted above, workers in Newfoundland and Labrador tend to retire several years earlier than is the average for the rest of the Canadian economy and retirements account for roughly half of all the people who will leave the provincial agri-food sector's labour force by 2029. As such, even moderate gains in this regard can result in material improvements in the labour gap going forward. Employers could also tap into pools of recently retired farm workers or those with agri-food backgrounds for recruitment. And to the extent that this demographic is motivated more by lifestyle considerations than compensation, and driven by a desire to keep active, employers could provide part-time work options to employees who are considering retirement.

## 6.3 Investing in Productivity

Tapping new pools of labour for recruitment and improving retention of its existing workforce are two ways that the industry can increase the number of domestic workers it has available in the future. But the gap can also be mitigated, and production targets can still be reached, by investing in productivity and reducing the need for more workers in the future. For example, the baseline forecast assumes aggregate productivity within the agri-food sector will average 1.6% a year, which although high relative to the Canadian economy, is below the rates the industry has produced over the past 20 years. If the industry could increase productivity by just half a percentage point a year, to an average of 2.1%, this would reduce the gap by between 110 and 150 workers depending on the scenario.

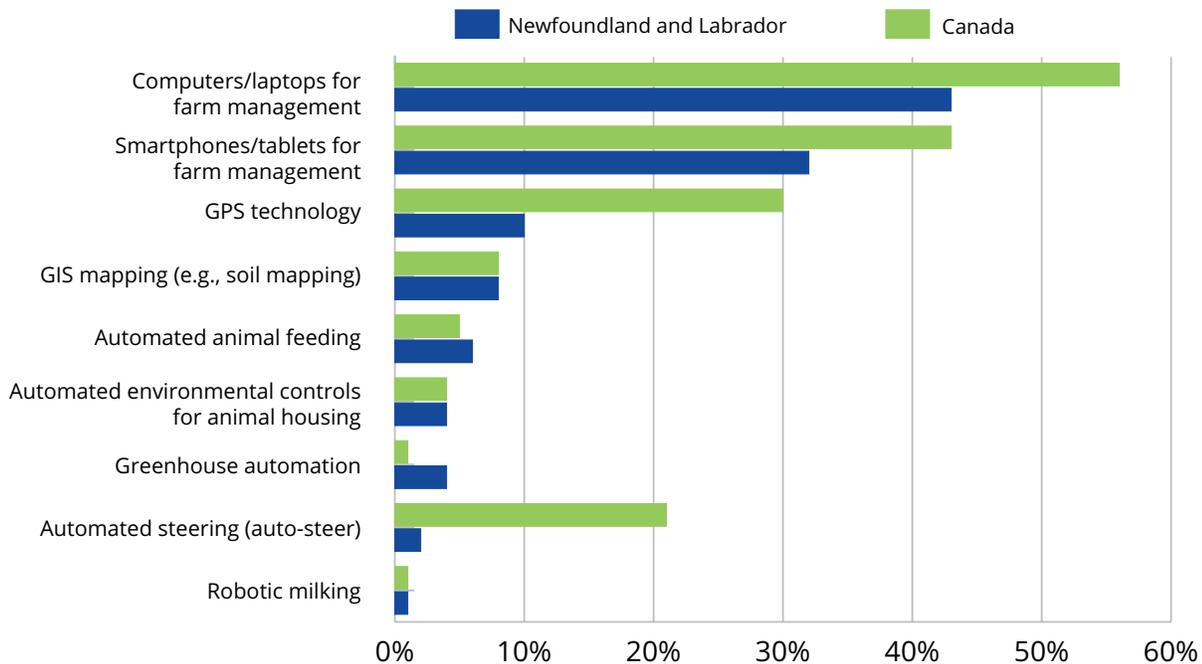
While higher productivity rates are unlikely to fully mitigate the impending labour shortage that the province's agri-food sector faces, it should be a vital part of any strategy designed to address the challenge.

Sustained investment in machinery and equipment will be crucial. Over the past decade, Newfoundland and Labrador's agriculture sector has already become more mechanized, which combined with new farming techniques, better seeds, and improved fertilizers, has supported gains in labour productivity. Still, Statistics Canada's 2016 Census of Agriculture finds that the adoption of technologies such as automated steering and the integration of smartphones and tablets for farm management, remain far less common in Newfoundland and Labrador than elsewhere in the country. (See Chart 18.) Thus, there is still room for the industry to build upon its recent productivity track record. The employer survey reveals that better access to finance would likely incent agri-food operators to increase their capital spending. This makes particular sense in Newfoundland and Labrador, where farms tend to be smaller on average, and are therefore likely to face greater barriers when attempting to access the funds required to invest in new technology and equipment. Indeed, 62% of employers in the survey said increased access to capital would make it easier for them to increase production and help the province reach its goal of higher levels of food self-sufficiency. (See Chart 19.) This was tied for the most frequently identified response with increased land availability, and ahead of other measures including abattoir development (52%) and buy local programs and branding (41%).

Effective training programs are another way that the agri-food sector can drive productivity growth. Many occupations, including agricultural specialists, biological technologists, and product

## Chart 18: Newfoundland and Labrador's Agriculture Sector Lags in Technological Adoption

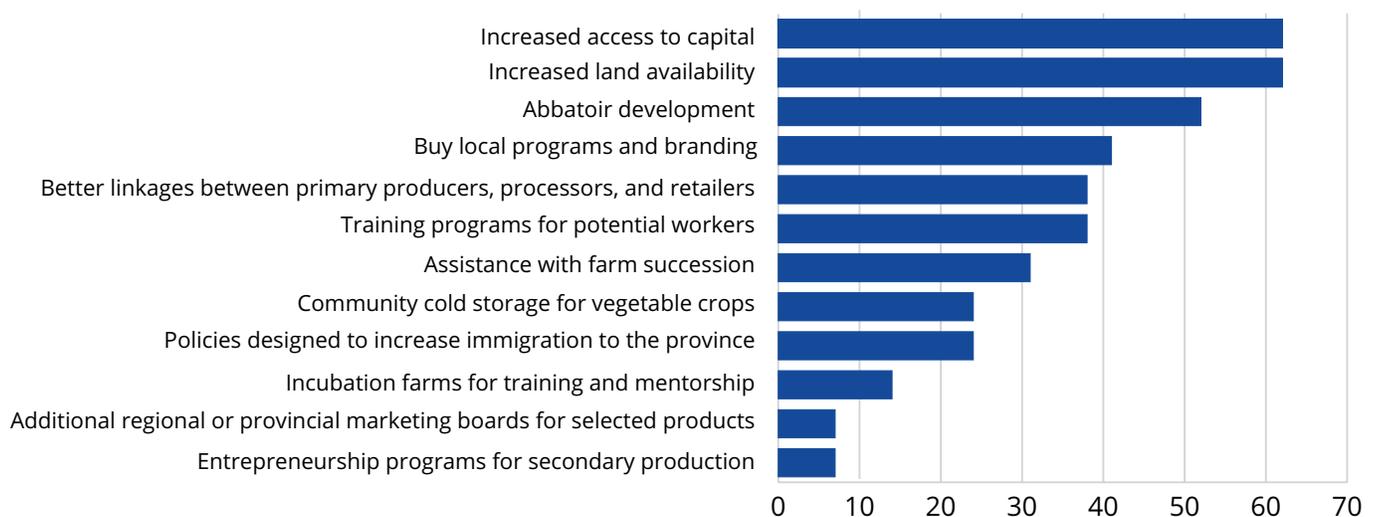
(share of farms reporting technologies used on their operation)



Source: Statistics Canada 2016 Census of Agriculture.

## Chart 19: Increased Access to Capital and Land Instrumental to Advancing Province's Food Self-Sufficiency

("What would be required to increase food self-sufficiency in Newfoundland and Labrador?", share of employers)



Based on a survey of 29 respondents

Source: Newfoundland and Labrador Federation of Agriculture Employer Survey.

inspectors will be in short supply. In the future, the changing nature of work in the industry and drive towards productivity will further fuel demand for these types of specialized skill sets and offering training to new and existing employees can help to address this challenge. Agri-food employers generally agree on the importance of training, with 38% of survey respondents reporting Newfoundland and Labrador could increase food self-sufficiency in the province through training programs for potential workers and another 14% supporting incubation farms for training and mentorship.

A final consideration could be a reorientation of the production mix in the province away from

## 7. Occupational Analyses

Two industries, Field Vegetable Production and Small-scale Dairy Processing were selected for a detailed occupational analysis as a part of this project. National Occupational Standards, Competency Profiles, and Skills Gap Analyses were developed for managers and workers in these industries. A review of the Training Capacity within and outside of the province was then completed. Finally, Occupational Profiles for these occupations were drafted to promote the opportunities for these occupations in Newfoundland and Labrador.

Occupations in Field Vegetable Production and Small-scale Dairy Processing in the Newfoundland and Labrador conditions were analyzed in detail as a part of the project. Based on the growth potential, and the contribution that the sub-sector would contribute to increasing food sustainability, Field Vegetable Production and Small-Scale Dairy Processing were identified by the Project Advisory Group as the two selected industries for detailed occupational analyses.

The Advisory Group indicated that there is an opportunity to build upon the existing strong

labour-intensive commodities. For example, horticulture producers generally employ far more workers per dollar of sales than do animal farmers, which reflects the fact that many jobs in horticulture still require personal judgment or fine motor skills that cannot, or at least cannot yet, be replicated by a machine. While switching to less-labour intensive production will not always be feasible, agri-food producers are generally willing to adapt what they produce to market conditions. In fact, 43% of agri-food producers expect to change what they produce at their operations over the next five years.

vegetable industry and increase field vegetable production, the number of acres under production and the number of new entrants to the sector. Although the dairy processing sector in the province is very small, the Advisory Group felt that there was a great opportunity for small dairy processors to utilize the milk produced in the province to process a variety of dairy products, including cheese, yoghurt, cream and ice cream.

It was felt that focusing on both the production of field vegetables and dairy processing, would increase the amounts of fresh vegetables and local dairy products consumed in the province.

Labour market information about occupations in need and training required for these occupations will move the province forward in realizing its goal to increase food self-sufficiency in the coming years. The labour market forecasts and occupational analyses will provide valuable information to job seekers, educators and government policymakers about current and future job opportunities to help attain this goal.

## 8. National Occupational Standards and Competency Profiles

National Occupational Standards and Competency Profiles for the roles of manager and worker for each industry were developed.

A National Occupational Standard defines what a person must be able to do and know to be successful in a role. It serves as a benchmark against which to recruit, select, train and develop employees. In academic and training settings, they can be used to benchmark a curriculum to the workforce requirements.

A competency profile is a set of competencies selected as the most important for successful job performance. It provides the definition and specifies the required proficiency level of each competency expected for a position. It starts with describing the job tasks and expectations and identifying the competencies needed of employees. These research documents are the foundation for the development of HR management employer tools, as well as training

programs that will help employers select the best people, oversee their performance and develop their skills.

During this project, background research of existing occupational information for the four roles were undertaken and interviews with subject matter specialists in the province and in other provinces were conducted to develop the occupational standards and competency profiles. Online focus groups with participants for each of two commodity areas were held to obtain expert opinions to validate and finalize occupational standards and competency profiles. Please contact the Newfoundland and Labrador Federation of Agriculture, at <http://www.nlfa.ca/>, for copies of the National Occupational Standards and Competency Profiles for Manager and Worker in both Field Vegetable Production and Small-Scale Dairy Processing.

## 9. Skills Gaps for Two Selected Industries

Once the Competency Profiles for the four roles were complete, a Skills Gap Analysis for each role was drafted. Industry stakeholders were interviewed to determine the skills and knowledge that are hard to find and results were validated with the Advisory Committee. Training offered within the province was then mapped against the gaps identified by the interviewees. It must be acknowledged, however, that many agricultural workers, including farm business owners and managers acquired their skills on-the-job and are not graduates of post-secondary educational programs. Please contact the

Newfoundland and Labrador Federation of Agriculture, at <http://www.nlfa.ca/>, for copies of the Skills Gap Analyses.

To identify skill gaps in the labour supply for field vegetables production managers in Newfoundland and Labrador, we interviewed vegetable farm owner-managers and examined a college program for agriculture in the province. The interviews revealed major gaps among job candidates in Food Safety. Small gaps were identified in the following areas: Agricultural Health and Safety, Field Vegetable Production, Teamwork, Financial Management, Human

Resources Management and Managing Risk. No significant gap was found in the college program curriculum.

To identify skill gaps in the labour supply for field vegetables production workers, we interviewed vegetable farm owner-managers and examined a college program for agriculture in the province. The interviews revealed major gaps among job candidates in Food Safety, Health and Safety, Environmentally Sustainable Work Practices, Using Equipment, Tools and Technology, Identifying Signs Of Crop Damage, And Continuous Learning. No significant gap was found in the college program curriculum.

To identify skill gaps in the labour supply for small-scale dairy processing managers in Newfoundland and Labrador, we interviewed a dairy processing manager and examined a college program for agriculture in the province. The interview revealed major gaps among job candidates in Dairy Processing and small gaps in other areas such as Agriculture Health and Safety. It is very challenging to find managers with knowledge in dairy processing within the province. Candidates usually come from

a different industry, such as food services. However, dairy processing knowledge is still lacking among these candidates. The interviewee commented that they have never received a job application from someone with knowledge in dairy processing. In recent years, there have been initiatives and grants to place new immigrants in agriculture, which can potentially help fill this skill gap. New immigrant candidates will need to learn English and update their knowledge (e.g., regulations) in order to be effective. The college program curriculum provides training on some skills required for managers, but there is no course specific to dairy product processing.

For dairy processing workers, the interview revealed major gaps among job candidates in Dairy Processing, Stress Tolerance, Attention to Detail, and Critical Thinking. There are small gaps in other areas such as Agriculture Health and Safety, Food Safety, and Equipment and Tools Maintenance. The college program curriculum provides training on some skills required for dairy processing workers, but there is no course specific to dairy processing.

## 10. Training Capacity Review

An extensive review of the training available to develop skills in the two industries was also undertaken. Relevant training available for the roles of manager and worker in the two selected industries were identified. The review includes current post-secondary training offerings in the province, other related training in Atlantic region and in other parts of Canada, as well as

online training. The Training Capacity Review was used to compare content of available training to the skills and knowledge needed in selected occupations in two commodity areas to identify gaps. Please contact the Newfoundland and Labrador Federation of Agriculture, at <http://www.nlfa.ca/>, for a copy of the Training Capacity Review.

# 11. Occupational Profiles

Occupational Profiles detailing skills and knowledge needed for manager and worker in both Field Vegetable Production and Dairy Processing were drafted. These profiles can be used to promote careers in agriculture and agri-food to students, parents, guidance

counsellors, employment counselors, and immigrants to better understand the skills and experience needed for each role. Please contact the Newfoundland and Labrador Federation of Agriculture, at <http://www.nlfa.ca/>, for copies of the Occupational Profiles.

# 12. Conclusion

Although the available information suggests that the agri-food sector currently benefits from a small labour surplus province wide, there is also ample evidence that pockets of labour shortages already exist in key occupations and industries, in part due to the geographic mismatch of labour supply and demand where employers in rural locations cannot attract available workers from urban settings. The impacts of these shortages include real financial costs for producers – we estimate that industry sales were reduced by 3.2% in 2018 – but also include excessive stress for owners and other staff, greater overtime costs, production delays, and in some cases even the closure of firms. Crucially, these shortages also reduce the sector’s long-term potential, as producers are forced to delay or cancel expansions or investments due to the lack of available labour.

This situation is projected to worsen in the future unless action is taken. A deficit of available domestic workers is expected to emerge between 2020 and 2022 depending on the scenario considered. What is more, by 2029, the number of domestic workers available to the agri-food sector falls short of labour requirements regardless of scenario. At that time, the sector will be facing a shortage of between 390 to 1,100

workers which is equivalent to between 21% and 42% of labour demand respectively.

The primary cause of the anticipated shortage of workers will be sustained contraction in the number of employees willing to work in the province’s agri-food sector. This is driven by a combination of mounting retirements, relatively low immigration numbers, and the fact that there will be fewer young people entering the labour force in coming years to replace workers that exit into retirement. These challenges are compounded by the barriers to recruitment and retention that agri-food employers face on a daily basis, including insufficient access to the right levels of experience or skill sets, the limited exposure that young people have with respect to career opportunities in the sector, working conditions (including manual labour and seasonality), and relatively low wages which are dictated by an external pricing mechanism in commodity markets.

To ensure that Newfoundland and Labrador’s agri-food sector will have a greater chance of achieving its potential and continuing to meet the rising need for food domestically and around the world, employers, governments, and other stakeholders will need to work collaboratively to address the labour challenges we have identified



in this report. There are solutions available and input collected from producers throughout this research points to towards several strategies which can help to mitigate labour shortages, and the economic costs associated with them, in the future. One way is to look for ways to increase future labour supply. This might involve tapping currently underrepresented groups. For example, women make up just 30% of the agri-food workforce in Newfoundland and Labrador, which is well below the 50% they make up of the entire provincial labour force, but also below the 34% they account for across the Canadian agriculture sector. Aboriginals are also underrepresented, accounting for just 6.2% of the province's agri-food workforce compared to 8.6% across all industries.

The survey results also indicated that the primary means of recruitment in the industry remains word of mouth. While this may have been effective historically, it severely curtails the pool of potential applicants for unfilled positions and does not align well with modern recruitment

practices. The sector and its partners should also improve marketing efforts to dispel many common myths that exist about the industry, like the perception that all agri-food work is manual labour for low pay. In fact, the sector offers a variety of careers pathways, many of which require technical skill sets and pay above-average wages. These efforts could extend to younger cohorts that are still in school to help socialize young people to the idea of a career in agriculture at an early age.

Finally, the sector must continue to build on its productivity performance. A high share of producers in our survey suggested that easier access to capital would allow them to invest in the modern farm equipment which is necessary for success in the 21<sup>st</sup> century. Paired with effective training programs, mentorship and incubator farms, and a shift away from labour-intensive commodities, productivity could improve and reduce labour requirements in the future below what is projected in the three scenarios outlined in this report.

# 13. Recommendations

As part of *The Way Forward vision*, the Provincial Government is engaging the agriculture and agri-food sectors through the Agriculture Sector Work Plan to address industry needs in ways that result in new employment and economic activity throughout the province. The Labour Market Project investigated the labour market needs, recruitment, retention, and emerging training needs of the agriculture industry. The following recommendations resulted from this research:

1. Conduct occupational analyses for sectors that have experienced a decrease in production in the past ten years. The occupational analyses will provide up-to-date information about the skills and experience needed for farm business owners and potential new entrants.
  - a. Develop National Occupational Standards, Competency Profiles, Skills Gap Analyses and Occupational Profiles for production and processing industries, including Greenhouse (i.e. controlled environments), Fresh Fruit and Berries, Apiary (i.e. honey and pollination services), and Livestock (i.e. beef, hogs, sheep and goat,) and Fur.
2. Promote careers in agriculture and agri-food to new entrants.
  - a. Develop and distribute Occupational Profiles to potential new entrants, including youth, newcomers and members of underrepresented groups. The Newfoundland and Labrador Federation of Agriculture, its member organizations, Agriculture in the Classroom, high school guidance counsellors, employment counsellors, and Indigenous communities could promote the various careers available in the sector.
  - b. Collaborate with other industries to promote the benefits of living in rural areas of the province.
3. Develop and implement an industry recruitment and retention strategy to support best practices in human resource management and ensure that there will be the workforce in place for growing the industry.
  - a. Focus on non-monetary compensation, i.e. benefits, to attract and retain workers.
4. Support training for agriculture and agri-food business owners and employees.
  - a. Increase industry awareness of existing educational and training programs for new farming employees and employers.
    - i. The Skills Gap Analysis reveals that the new Agriculture Technician Program offered by the College of the North Atlantic will provide training for the skills needed for managers and employees in field vegetable production. This program can be promoted to potential new entrants to the sector.

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- b. Develop training for skills identified in the Skills Gap Analyses.
    - i. There is no training program in the province for dairy processing and people with the skills needed for this industry are reported to be 'impossible to find' in the province. Consider developing a training program for dairy processing in the province. Alternatively, support individuals interested in becoming dairy processors in developing their skills out-of-province.
  - c. Develop non-formal training identified by employers, i.e. food safety for horticulture, via a variety of delivery methods, including mentorships, incubator farms and e-learning.
5. Increase immigration to fill skills gaps.
- a. Recruit immigrants with specialized skills i.e. in dairy processing to fill skills gaps. Employers have the opportunity to recruit immigrants with specialized skills through the Atlantic Immigration Pilot project for year-round employment.

All in all, the agri-food sector represents an important avenue for the province to grow its economy into the future. There are opportunities for domestic producers to secure a greater share of their home market as well as tap key exports markets globally to benefit from changing consumer tastes and rising incomes around the world. However, the sector will have to be proactive in addressing the labour market pressures that this research has identified if it is to reach its ultimate potential.

# Appendix: Definitions and Classifications

## Commodity Groups Breakdown

For this project, the agri-food sector is classified following the North American Industry Classification System. In this system, primary agriculture production is classified in two large categories, namely animal and crops. Each of these categories is then split into multiple segments, specialized in the production of a specific commodity. (See Table 6.) When a farmer is involved in more than one type of production, its activities will be classified under the category that counts for the largest part of overall sales. The cattle industry includes beef and dairy farming.

Food processing covers three segments and includes fruit and vegetable, dairy, and meat, manufacturing.

**Table 6: Classification of Commodity Groups as Defined in the North American Industry Classification System (NAICS)**

		Commodity Groups	NAICS Codes Corresponding to CAHRC Commodity Groups
<b>Primary agriculture (i.e. On-farm production)</b>	<b>Animal</b>	Beef and dairy	1121 Cattle Ranching and Farming
		Swine	1122 Hog and Pig Farming
		Poultry and egg	1123 Poultry and Egg Production
		Mixed animal (e.g., horse, bison, rabbits)	1129 Other Animal Production
	<b>Crop</b>	Crops	1111 Oilseed and Grain Farming
		Fruit and vegetable	1112 Vegetable and Melon Farming
		Greenhouse, nursery, and floriculture	1114 Greenhouse, Nursery and Floriculture
		Mixed crop (maple syrup, hay, tobacco)	1119 Other Crop Farming
<b>Food processing (i.e. primary processing)</b>	Fruit and vegetable manufacturing	3114 Fruit and Vegetable Preserving	
	Dairy manufacturing	3115 Dairy Product Manufacturing	
	Meat manufacturing	3116 Meat Product Manufacturing	

A complete description of the North American Industry Classification System can be found here:

<http://www23.statcan.gc.ca/imdb/p3VD.pl?Function=getVDPPage1&db=imdb&dis=2&adm=8&TVD=118464>

## Selected Occupations

For the purpose of this project, we have classified the workforce into a total of 19 occupations. (See Tables 7.) The selected occupations and groupings were determined based on the number of agri-food workers found in each occupation and the predominance of the occupation in the agri-food sector. The classification was in line with the National Occupational Classification (NOC) 2011 system used by Statistics Canada to organize occupational data.

**Table 7: Classification of Occupations Using the National Occupational Classification System (NOC)**

NOC Code	Occupation
0016	Senior Managers - construction, transportation, production, utilities
0821	Managers in agriculture
0822	Managers in horticulture
2123	Agricultural representatives, consultants and specialists
2221	Biological technologists and technicians
2222	Agricultural and fish products inspectors
2225	Landscape and horticulture technicians and specialists
7312	Heavy-duty equipment mechanics
7511	Transport truck drivers
8252	Agricultural service contractors, farm supervisors and specialized livestock workers
8255	Contractors and supervisors, landscaping, grounds maintenance and horticulture services
8431	General farm workers
8432	Nursery and greenhouse workers
8611	Harvesting labourers
8612	Landscaping and grounds maintenance labourers
9461	Process Control and Machine Operators, Food and Beverage Processing
9462	Industrial Butchers and Meat Cutters, Poultry Preparers
9465	Testers and Graders, food and beverage processing
9617	Labourers in Food and Beverage Processing

A complete description of the National Occupational Classification (NOC) 2011 can be found here:

<http://www23.statcan.gc.ca/imdb/p3VD.pl?Function=getVDPPage1&db=imdb&dis=2&adm=8&TVD=122372>

## About the Survey

Part of the analysis in this report is based on a survey of agri-food employers in Newfoundland and Labrador. Our aim was to obtain at least 30 responses to the online survey, which we were able to achieve. The survey was conducted between October and December 2018 and generated 36 responses, including 9 from crop producers in the province, 22 animal producers, and 5 food manufacturers. Based on the available information from Statistics Canada, this is equivalent to roughly one in every five agri-food operations in the province.<sup>17</sup>

The survey was distributed by the Newfoundland and Labrador Federation of Agriculture which engaged producer associations in the province to distribute the survey to their members. Although the number of responses relative to the number of firms in the province is relatively high overall, the sample size is small in some sub-sectors of the industry. As well, the samples were

not stratified and as such, are not necessarily representative of the underlying population of agri-food firms in the provinces. While we can speak definitively to the responses of those who were surveyed, extrapolating the results to the entire agri-food sector in the province, particularly in industries where responses may be low, should be done with caution.

Despite these limitations, and assuming that the views expressed by the sample of firms who responded to our survey is reflective of the aggregate agri-food population in the province, we estimate that the margin of error on the survey results overall is 15% at the 95% level of confidence. Thus, our survey suggests that 68% of agri-food producers were able to hire all the workers they needed in 2018. Based on this estimated margin of error, we can be fairly confident that as few as 53% to as many as 83% of agri-food producers in Newfoundland and Labrador are able to find all the workers they need.

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<sup>17</sup> Statistics Canada. Table 33-10-0105-01 Canadian Business Counts, with employees, December 2018.

# Glossary

- **Workforce:** Every person who contributes to the operation of a farm, including owner/operators, paid workers, unpaid workers, and foreign workers.
- **Potential demand:** This refers to the number of workers the industry needs in order to reach its full production potential. The demand for workers is driven by market conditions, the demand for agricultural products, and productivity growth. Historically, it is the sum of the workforce and unfilled vacancies.
- **Domestic supply:** This refers to the number of domestic workers available, including Canadians and permanent residents. Supply includes owner/operators, paid workers, and unpaid workers. It is driven by demographic factors such as retirement, young workers joining the labour force, immigration, migrants from other provinces, and workers shifting to and from other sectors.
- **Gap:** This refers to potential demand less domestic supply.
  - There is a gap when domestic supply is not sufficient to meet the demand. As such, the gap can be interpreted as a measure of labour shortages faced by employers.
  - Foreign workers, including seasonal agricultural workers and unfilled vacancies, are used to estimate the gap. Both indicate a level of demand by employers that domestic supply was not able to fill.
- **Voluntary turnover:** The voluntary rate is calculated as the number of people who departed from a job voluntarily (such as leaving for another job) divided by the total number of workers.
- **Involuntary turnover:** The involuntary rate is calculated as the number of people who departed from a job involuntarily (such as being dismissed) divided by the total number of workers.