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This report entitled Strengthening Canada's Agriculture and Agri-Food Business Data Systems was produced by SJT Solutions. The report was commissioned for discussion purposes by Agriculture and Agri-Food Canada (AAFC) on behalf of the Value Chain Roundtables (VCRTs), an industry-government forum.

The content of this report does not necessarily reflect the opinions or interests of the entire VCRT membership or AAFC, nor does it necessarily reflect the opinions or interests of all parties interviewed during the researching of this report. The recommendations resulting from the report are not binding on any participant of the VCRTs or AAFC.

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## *Strengthening Canada's Agricultural and Agri-Food Business Data Systems – Final Report*

March 31, 2016

## Executive Summary

This report, commissioned by the Business Data Working Group, provides an inventory of data gaps impacting business decisions by Canada's agriculture and food sector. It also provides inventories of the impacts of data gaps and industry priorities for dealing with the gaps. The current data collection and dissemination system was reviewed. Previous and current initiatives to close data gaps were identified. The impact of technology on data collection was also discussed.

Consultations were conducted with 13 value chain roundtables plus the CAHRC as well as federal and provincial government officials and the Grain Monitoring Program. Altogether 41 interviews were conducted.

**The interviewees identified 272 data gaps** such as missing, inaccurate, less than timely, and inaccessible. **After removing double counting in the grains area, the number of data gaps dropped to 223.** The marketing area had the most data gaps (44%) followed by trade (18%). The sectors with the most data gaps were grains (16%), sheep (13%), and beef (11%).

Strategic suggestions to deal with the data gaps were based on impacts of the gaps, industry priorities, and contextual information about Canada's agriculture and food sector. The strategic suggestions were as follows:

### In the area of trade data gaps:

- Trade data, in terms of HS codes, should be enhanced as they are critical tools for investment, market development initiatives, and business decisions. Reporting should be enhanced so that it meets the needs of industry in terms of timeliness and accuracy.
- Access to market access information should be improved.

### In the area of marketing data gaps:

- The lack of price transparency in Canadian agriculture has a high cost. Industry and governments should work together to enhance price transparency. The effectiveness of current price transparency initiatives should be evaluated in order to determine if they could provide a template.
- Statistics Canada and AAFC should continue their efforts to improve crop production estimates. Technology, such as remote sensing, can play a significant role in this. Better communication between industry and AAFC and Statistics Canada should also be encouraged.
- A proper supply and disposition (S&D) table for each commodity is a necessity and not a "nice to have". Industry, AAFC, and Statistics Canada could collaborate in the development of robust S&D for crops and livestock commodities. Industry, through collaboration with its members could help statistical agencies develop a methodology for measuring domestic utilization and US utilization. AAFC and Statistics Canada should collaborate and agree on one type of supply and disposition.

- Industry and AAFC should collaborate to produce more market intelligence and analysis for domestic and foreign markets for all commodities.
- The seafood sector, Fisheries and Oceans Canada and AAFC should collaborate to improve the collection and dissemination of data for the seafood sector.
- AAFC, Statistics Canada and the certification authorities should collaborate to produce more information about organics in Canada. The organic sector is valuable but without accurate information, it can be difficult to grow strategically or to monitor.
- Understanding interprovincial trade flows is difficult without data. The use of traceability systems and big data should be explored as potential solutions to this gap.

In the area of transportation and logistics data gaps:

- The Grain Monitoring Program and the Ag Transport Coalition provide valuable information to the pulse and grain sectors. AAFC and Transport Canada should ensure the funding for these initiatives continues after 2017.
- The Grain Monitoring Program, AAFC, and Transport Canada should collaborate to fill the gaps in the GMP data that have been identified.

In the area of sustainability data gaps:

- Much work must be done to produce data that can be used for metrics in the area of sustainability which includes environmental, economic, and social dimensions. Support should be provided for the development of this data.
- To improve the certification process, the seafood sector, Fisheries and Oceans Canada and AAFC should collaborate to improve the collection and dissemination of data for the seafood sector.
- Technology will play a large role in sustainability. Precision agriculture and public data could be integrated to support sustainable land management and science-based land policies. A public-private partnership approach to support the development and testing of these data systems should be considered.

In the area of traceability data gaps:

- Data gaps in traceability can increase the risk associated with an adverse event as well as reduce producer participation in these programs. Smaller sectors may require more support from government in order to implement an effective traceability program. This should be strongly considered.
- The use of technology could expand the benefits and coverage of traceability programs and thus should be encouraged.

In the area of emerging issues data gaps:

- Some sectors lack AMR/AMU data and others have holes in their data. Industry and government should work together to improve AMR/AMU data collection and dissemination.
- Industry and government should start a discussion on social license/public confidence and develop metrics for it.

In the area of labour data gaps:

- The CAHRC should work with Statistics Canada to ensure that the data used in the Temporary Foreign Worker Program is as accurate as possible.
- The CAHRC should enhance its dissemination of its analysis of Statistics Canada's Labour Force Survey and the Job Vacancy and Wage Rate Survey. Greater outreach would also be beneficial.
- The CAHRC and Employment and Social Development Canada (ESDC) should collaborate to improve National Occupation Classification codes.
- Research to determine labour needs in primary processing plants should be encouraged.

The implementation of the strategic suggestions made in this section can be improved through the following **enablers**:

- Improved outreach with respect to existing data and its use and data solutions such as remote sensing would be beneficial.
- Continued strong dialogue between Statistics Canada and AAFC is important and should be strongly encouraged.
- There are and will be opportunities to collect data using technology and these should be pursued. Having a single technology/system to collect data from producers would reduce response burden and costs.
- The Business Data Working Group (BDWG) has shown that there is value for both the agricultural sectors and Statistics Canada in having a greater connection to discuss data needs to drive progress and investment decisions. Industry representation should be enhanced in Statistics Canada's Agricultural Statistics Advisory Committee. Statistics Canada should consult with industry to implement the recommendations under its scope in this report.

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## 1.0 Introduction

The Business Data Working Group (BDWG) was formed after a discussion at the Chairs of the Value Chain Roundtable meeting in February 2015 about the importance of sound and accurate information to drive higher levels of supply chain performance. The BDWG has been tasked with identifying and reporting on information/data gaps and weaknesses affecting business decisions in the areas of marketing, transportation and logistics, trade, sustainability and traceability. This report, commissioned by the BDWG, will:

- 1) catalogue and assemble work underway to identify and address data gaps
- 2) conduct sector by sector review of data gaps through interviews and relevant research
- 3) summarize and articulate industry priorities and opportunities for enhancing data collection on an aggregated national level
- 4) identify opportunities for enhancing coordination and methods of data collection
- 5) provide strategic suggestions including alternative data collection systems and international trends such as big data and satellite imagery

This report is based on primary and secondary research. Consultations were held with 13 value chain roundtables,<sup>1</sup> the CAHRC, three federal government departments, one provincial government, and the Grain Monitoring Program. Altogether, 41 interviews were conducted and 63 individuals were interviewed or material was received from them. The interview list is in Annex 6.1. The raw data from the interviews is contained in a separate document.

The report begins with an overview of the current system in Canada for collecting and disseminating data and the strengths and weakness of the system. Changes in technology, such as big data and remote sensing and how that may impact data collection, is then discussed. This is followed by a chapter on data gaps which looks at previous work done on the issue; provides the inventory of data gaps identified by the sectors; discusses the impacts of the identified gaps; presents the priorities of industry regarding the data gaps; identifies initiatives underway to close the gaps; discusses how technology could be used to close the gaps; and discusses whether further work to close data gaps is required. The final chapter presents strategic suggestions for moving forward.

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<sup>1</sup> The roundtables are special crops, seed, sheep, seafood, pulses, pork, organic, industrial bioproducts, horticulture, grains, food processing, beef, and bee health. In the report, seafood is broken into seafood and aquaculture.



## 2.0 Current Data System and Its Strengths and Weaknesses

This chapter examines how data needed by Canada's agriculture and food sector is currently collected and disseminated. After an overview, public sector sources of data are identified as well as the strengths and weaknesses. This is followed by a similar examination of industry sources of data.

### 2.1 Overview of the Current Canadian Collection and the Dissemination System

A wide variety of sources are used in business decisions in the areas of trade, marketing, transportation/logistics, sustainability, traceability, and emerging areas such as social license/public confidence, and anti-microbial resistance/anti-microbial use (AMR/AMU). As shown below, Canadian and foreign public, private, and industry sources are used.<sup>2</sup> A list of abbreviations is contained in Annex 6.2.

Figure 1: Some of the Current Data Sources for Decision Making



**Statistics Canada is the primary source for trade data and is also a major source of data for marketing decisions.** Agriculture and Agri-Food Canada (AAFC) also provides trade and marketing information. Fisheries and Oceans Canada (DFO) provides market information to the seafood and aquaculture sectors. As shown below, **industry is heavily involved in the provision of information for making many types of decisions.** An inventory of the current data used by sector by decision area is contained in Annex 6.3.

<sup>2</sup> The focus here is on the publication of data and not the original collectors such as CBSA and CFIA.

Table 1: Data Sources by Decision Area

Area	Data Sources
<b>Trade</b>	Canadian: Statistics Canada, AAFC, CGC, CFIA, Foreign: USITC, USDA, Global Trade Atlas, FAO, Bryant Christie, Homogoga
<b>Marketing</b>	Canadian: Statistics Canada, AAFC, CFIA, CanFax, BFO, FPBQ, POGA, Variety Trials, Seed Companies, Buyers, Processors, ICE, PDQ, Market Advisors, Brokers, Agricorp, GFO, PGQ, COTA, AE Neilson, Western Hog Exchange, Hams Marketing Service, Ontario Pork, Provincial Governments, FPPQ, CSTA, CSGA, AB Lamb Producers, Ontario Sheep, DFO, Organic Certification Bodies Foreign: USDA, National Honey Board, CBOT, Organics International
<b>Transportation &amp; Logistics</b>	Canadian: GMP, Ag Transportation Coalition, CN, CP Foreign: USDA, AAR
<b>Sustainability</b>	Canadian: COA, FEMS, DFO, BCSFA, Western Cow Calf Survey, Beef Sustainability Survey, Forage Survey
<b>Traceability</b>	Canadian: Beef Information Exchange System, CFIA, PigTrace
<b>Social License/Public Confidence</b>	Canadian: CAIA, Canada General Standards Board, COA, Statistics Canada, CropLife Canada, Food Safe Farm Practices
<b>AMR/AMU</b>	Canadian: CIPARS, CAHI, CSHIN, WCSHIN, RAIZO, Swine Health Ontario
<b>Labour</b>	Canadian: Statistics Canada, Horticulture Industry Survey

## 2.2 Canadian Public Sector Sources - Strengths and Weaknesses

Statistics Canada, AAFC, Canadian Grain Commission, CIPARS, and Fisheries and Oceans Canada provide valuable information for decision making in the agriculture and food industry.

### 2.2.1 Statistics Canada

Statistics Canada is Canada's national statistical organization. Its agricultural and labour data is used by the roundtables.

#### 2.2.1.1 Agricultural Statistical System

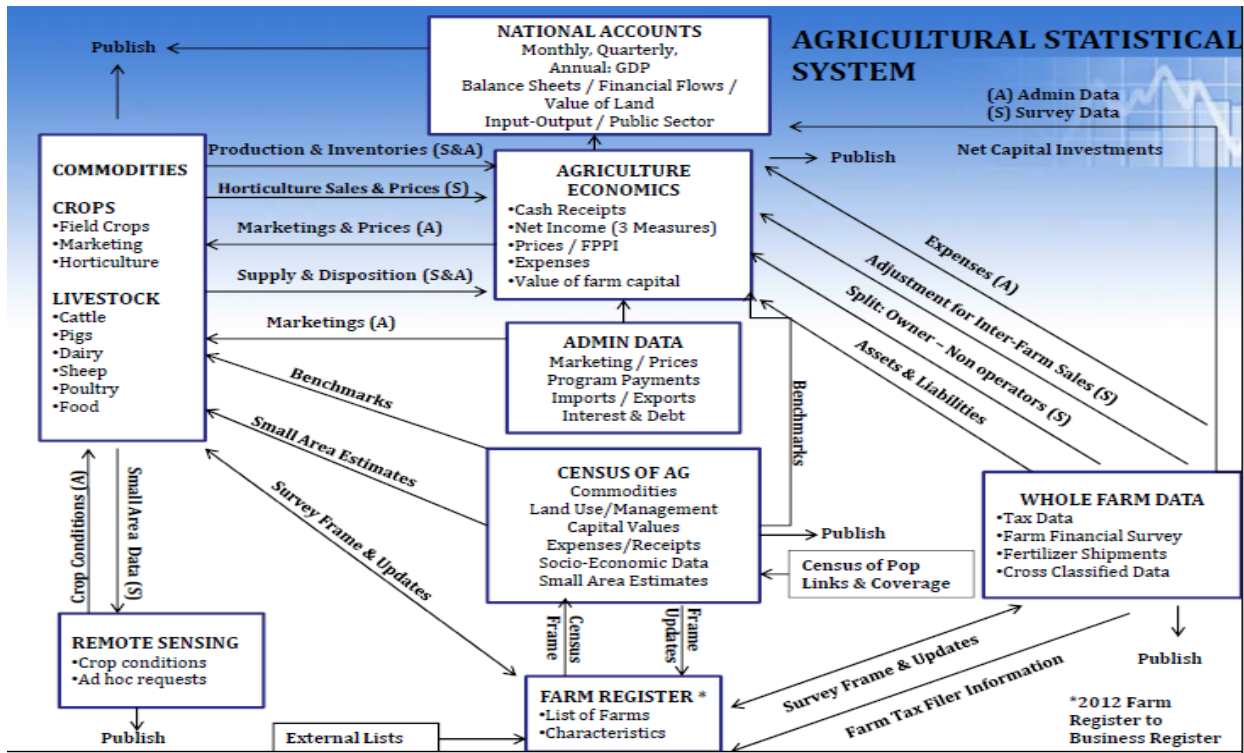
Much of the data used by producers and others in the supply chain is managed by Statistics Canada. Its major sources of data are the Census of Agriculture, surveys, administrative data and remote sensing. The Census, conducted every five years, provides a wide range of data for farms fitting the definition. The Census of Agriculture provides 1) benchmarking; 2) farm information; 3) data for small geographic areas; 4) data for cross-tabulations for whole farm analysis; and 5) understanding rare and emerging commodities. Surveys are used to collect information on farm finances and on specific commodities (field crops, livestock and horticulture). Administrative data about tax data, inspections, production, and other topics is gathered from over 100 different sources such as Canada Revenue Agency and producer organizations. Information on crop and pasture conditions is provided by the Crop Condition Assessment Project (CCAP) which is delivered by remote sensing. An overview of Statistics Canada's system of agricultural statistics (circa 2012) is shown below (The Farm Register did move to the Business Register).<sup>3</sup> **The Statistics Act requires mandatory participation in the Census, Census of Agriculture, Labour Force Survey, Canadian National Health Survey, and business or agricultural surveys.**<sup>4</sup>

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<sup>3</sup> Agricultural Division, Statistics Canada, "Agriculture Statistics Program Review", August 2012

<sup>4</sup> <http://www.statcan.gc.ca/eng/survey/participant04>

Figure 2: Statistics Canada's Agricultural Statistics System



Source: Agricultural Division, Statistics Canada, "Agriculture Statistics Program Review", August 2012

**AAFC's Research and Analysis Directorate manages AAFC's contract (five years) with Statistics Canada. It is also a key user of data, providing advice to the Minister. It contracts work such as the FEMS and FFS to Statistics Canada. AAFC consults internally to identify which Statistics Canada projects to fund. AAFC funds the basic data to run its analytical tools and does not experience any predictable and recurring data gaps.**

Strengths and weaknesses of Statistics Canada's current data collection and dissemination were identified from a literature search and interviews.<sup>5</sup> As shown below, Statistics Canada has made an effort to reduce the survey burden by increasing its use of administrative data. Statistics Canada is recognized as being a trustworthy collector and disseminator of confidential information. Some parts of industry, however, have concerns about the timeliness and accuracy of some of its data.

<sup>5</sup> Literature reviewed: Agricultural Division, Statistics Canada, "Agriculture Statistics Program Review", August 2012

**Strengths:**

- Statistics Canada and AAFC have a long history of collaboration and jointly managed agricultural statistics. Both have a long- term view and are professional.
- Industry recognizes the crucial aspects of Statistics Canada with respect to confidentiality. Smaller industry organizations like mushroom growers would not be able to get information like Statistics Canada can. Growers trust Statistics Canada.
- Statistics Canada is very supportive of the Census of Agriculture. The census data can be used for a variety of purposes: policy making, policy evaluation, benchmarking, program monitoring, trade purposes, measurement of structural change, and regulatory instruments. The program has a long history which means it also has the advantages of reliability and predictability.
- Statistics Canada has reduced the survey burden on respondents by replacing some surveys with administrative data from marketing boards and regulatory agencies.

**Weaknesses:**

- There are ongoing concerns about how to ensure the data system responds to the needs of industry and government. Statistics Canada has an advisory committee on agricultural statistics with federal and provincial representation (AAFC is only an observer). The committee has some industry and academic members.
- Timeliness of the availability of data is a concern at times to some sectors.
- The accuracy of Statistics Canada data in some areas is perceived by some to be an issue.
- Some of Statistics Canada's S&D data could be accurate and timely, as well as a strengthened continuity
- Statistics Canada needs to do outreach – some say they don't know what data it has.
- Some in industry believe that Statistics Canada's data doesn't provide information on quality attributes such as protein levels. Some in industry add there could be improvements on providing estimates of the size of crop
- For the organic sector, the Census of Agriculture is of limited value and is only done every 5 years. For the organic sector, the data collected needs to provide more information on commodities and volumes produced.
- Statistics Canada's web site is difficult to use for some in industry.

*2.2.2.2 Labour Market Information*

Canada's agri-food sector also uses labour market information from Statistics Canada. The three major products used are: Labour Force Survey; The Job Vacancy and Wage Survey; and The Annual Greenhouse, Sod and Nursery Survey.

- Labour Force Survey (LFS): "The Labour Force Survey provides estimates of employment and unemployment which are among the most timely and important measures of performance of the Canadian economy. With the release of the survey results only 10 days after the completion of data collection, the LFS estimates are the first of the major monthly economic data series to be released. The Canadian Labour Force Survey was developed following the Second World War to satisfy a need for reliable and timely data on the labour market. Information was urgently required on the massive labour market changes involved in the transition from a war to a peace-time economy. The main

objective of the LFS is to divide the working-age population into three mutually exclusive classifications - employed, unemployed, and not in the labour force - and to provide descriptive and explanatory data on each of these. LFS data are used to produce the well-known unemployment rate as well as other standard labour market indicators such as the employment rate and the participation rate. The LFS also provides employment estimates by industry, occupation, public and private sector, hours worked and much more, all cross-classifiable by a variety of demographic characteristics. Estimates are produced for Canada, the provinces, the territories and a large number of sub-provincial regions. For employees, wage rates, union status, job permanency and workplace size are also produced. <sup>6</sup>

- Job Vacancy and Wage Survey: “The Job Vacancy and Wage Survey (JVWS) is a quarterly survey that provides comprehensive information on job vacancies by industry sector, detailed occupations and skill level sought for Canada, the provinces, territories and economic regions. With its broader scope and greater detail, the JVWS is Statistics Canada's foremost source of current and comprehensive information on job vacancies in Canada. The JVWS, sponsored by Employment and Social Development Canada, is the largest survey on job vacancies ever conducted by Statistics Canada. It responds to key labour market information needs by providing data on current and emerging labour market demand. Results will support decision making by job seekers, students, employers and policy makers. JVWS data are not seasonally adjusted. Therefore, quarter-to-quarter comparisons should be interpreted with caution. The annual wage and employment data by occupation started being collected for the wage component of the survey in 2016.”<sup>7</sup>
- Annual Greenhouse Sod, Nursery Survey – information on number of seasonal; number of permanent; number of total; and total payroll

The strengths and weakness of Statistics Canada’s labor data are shown below. Statistics Canada’s labour data is sound and provides a good base for analysis. Industry identified data issues associated with the Temporary Foreign Worker Program as a concern.

<sup>6</sup> <http://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=3701>

<sup>7</sup> <http://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=5217>

**Strengths:**

- Labour Force Survey provides a wide range of important socio-economic variables including age, sex, class of worker, type of work, and hourly and weekly wages, on a monthly basis.
- The Job Vacancy and Wage survey provides a wealth of information on labour demand, including the number of job vacancies, the wages offered, the skills needed, and the length of time required to fill positions.
- The Job Vacancy and Wage Survey covers a wide range of the agriculture and food sector; provides data by 3-digit North American Industry Classification System (NAICS), 4-digit National Occupation Classification Code (NOC), province, and economic region.
- The structures of the labour force survey and the wage and vacancy survey are good for getting information on labour and provide a firm foundation to build on. For example, over-sampling would improve the data quality. To delve deeper into labour use at the farm level, questions could be included on the Farm Financial Survey which is done every two years.

**Weaknesses:**

- The Labour Force Survey only provides publicly available information for agriculture at the aggregate level and does not include aquaculture. More detailed data must be requested. Although detailed industry data is available through the Survey of Employment Payroll and Hours (SEPH), the agriculture sector is not included. SEPH excludes the agriculture sector because it is a *business* survey. Approximately 60% of people working in agriculture are self-employed and are therefore out of scope for SEPH.
- There is no separate data available on temporary foreign workers in the Labour Force Survey. As with everyone who responds to the Labour Force Survey, they are included in the survey if they consider the selected household to be their permanent residence. In this case, they would be included in the relatively small group who were not born in Canada and who are not landed immigrants. This group represents less than 2% of employed people in Canada.
- The Job Vacancy and Wage survey public reports do not delve into the data; specific and detailed NAICS/NOC or regional information must be pulled from CANSIM. CAHRC pulls more detailed data from CANSIM but does not appear to publish it.
- In the Annual Greenhouse Sod, Nursery Survey, some provinces have data withheld because of confidentiality.
- National Occupation Codes: most agriculture workers are classified as a low skill occupation in the National Occupation Classification codes. This is creating problems in immigration and in the TFWP. CAHRC has examined this issue.

**2.2.2 AAFC**

AAFC is a source of data for the livestock, horticulture and grain sectors. Data is primarily reported through its Industry Markets and Trade section of its website. The data is used extensively. For

Strengths:

- Transparent collection and reporting methodologies
- Confidentiality of business information
- Nationally focused
- Comprehensive data available to all sizes of companies or sectors
- Security for collection and dissemination
- Foundation for market analysis, industry intelligence, policy research, and policy advice
- All data is free and available to all, and is considered to be transparent, accessible and accurate

Weaknesses:

- Some users find the site confusing
- Some users find that the information is not updated frequently enough
- Provision of information is voluntary; relying on good will

example, the horticulture section receives 1,320 visits each month, while the animal market information receives 1.3 M views each year. The AAFC data is used by industry, CFIA, CBSA, and internal clients such as the Programs Branch, Strategic Policy Branch, and the Market and Industry Services Branch. AAFC has been collecting and reporting data since 1905.<sup>8</sup> AAFC's provision of geo-spatial data (also discussed in this section) is very recent in comparison. The strengths and weaknesses of AAFC's livestock, horticulture, and grain data are shown below.

### *2.2.2.1 Animal Market Information Program*

AAFC has been collecting and reporting animal market information since 1905.

The Animal Industry Division (AID) collects and disseminates red meat, dairy and poultry sector data providing accurate, unbiased, reliable, timely information that is made available through multiple channels (web-based reports, weekly reports via email and custom responses to individual queries). The program collects/stores and disseminates the following data sets through primary and secondary collection:

- Slaughter (federally and provincially inspected)
- Storage Stocks
- Hatcheries/Processed Eggs
- Prices by sector and subsectors
- Imports and Exports
- Condemnations
- Carcass Weights

<sup>8</sup> Market and Industry Service Branch, Sector Development and Analysis Directorate, AAFC, "Agricultural Market Information", October 2015



- Animal Registrations
- Cheese Directory

As legislative requirements are not in place to mandate data collection, the success of the program is dependent on establishing strong working relationships with data providers and users, matched with the skills of the market information staff to collect and report useful information. Data providers include slaughter, hatchery and storage establishments, industry groups, the Canadian Food Inspection Agency, Canada Border Services Agency, Statistics Canada and provincial governments.

AID produces 263 reports weekly/monthly/annually, disseminating 149 of these reports via the AAFC website ([www.agr.gc.ca/redmeat](http://www.agr.gc.ca/redmeat) [www.agr.gc.ca/poultry-volaille](http://www.agr.gc.ca/poultry-volaille) [www.dairyinfo.gc.ca](http://www.dairyinfo.gc.ca)) and another 114 reports through email. The websites strive for single window service, accommodating 1.3 million views annually. Custom reports are delivered directly to over 500 clients on a weekly/monthly basis.”<sup>9</sup>

A summary of the extensive data on the AID site pertaining to cattle, hogs, and sheep is shown below.

Table 2: Cattle, Hog and Sheep Data

	Cattle/Beef	Hogs/Pork	Sheep
<b>At the Farm</b>			
Inventory (two times/year)	Yes	Yes	Yes
Inventory by Farm Type	Yes	Yes	
Comparison with US	Yes	Yes	Yes
On Feed	Yes		
Farm Cash Receipts	Yes	Yes	Yes
Annual Value/Head	Yes	Yes	Yes
Wool Purchase, Price & Value			Yes
<b>Animal Genetics</b>			
Animal Registrations	Yes	Yes	Yes
Genetic Exports	Yes	Yes	Yes
<b>Processing Sector</b>			
Condemnations in Federally Inspected Plants	Yes	Yes	
Slaughter	Yes	Yes	Yes
Carcass Reports	Yes	Yes	Yes
Carcass Weights	Yes	Yes	
Slaughter by Province of Origin		Yes	
Production of Meat	Yes	Yes	Yes
Stocks of Frozen and Chilled Meats, Imported and Domestic	Yes	Yes	Yes
Stocks of Imported Meat	Yes		Yes
Supply and Disposition	Yes	Yes	Yes
<b>The Consumer</b>			
Per Capita Protein Disappearance	Yes	Yes	Yes
Annual Demand for Meat	Yes	Yes	Yes
<b>Prices and Market Indicators</b>			
Prices Weekly and Monthly	Yes	Yes	Yes
Average Price by Species	Yes	Yes	
Weighted Average Price	Yes	Yes	Yes
Consumer Price Index	Yes	Yes	

<sup>9</sup> Cathy Istead, AAFC.

Industrial Price Index	Yes	Yes	
<b>Imports and Exports</b>			
Trade Balance	Yes	Yes	
Imports from US	Yes	Yes	Yes
Exports to US	Yes	Yes	Yes

Source: <http://www.agr.gc.ca/eng/industry-markets-and-trade/statistics-and-market-information/by-product-sector/red-meat-and-livestock/red-meat-and-livestock-market-information/supply-and-disposition/?id=141586000021>

### 2.2.2.2 Grain Market Information

The Grains and Oilseeds Division of Market and Industry Services Branch is responsible for the collection and reporting of information on grain markets. Its reports are as follows:

- **“Canada: Outlook for Principal Field Crops** (AAFC website): This monthly report is emailed to several thousand subscribers in the grain industry, media and government and subsequently made available to the general public on AAFC’s website. The report provides an overview of the situation for the current crop year and the outlook for the upcoming crop year for all the major crops grown in Canada. For example, the grains and oilseed (G&O) crops are durum, wheat ex-durum, barley, oats, corn, rye, mixed grain, canola, soybeans and flaxseed. The pulses and special crops (P&SC) crops are dry peas, lentils, dry beans, chickpeas, mustard seed, canary seed and sunflower seed.

For each crop:

- on the supply side, the report provides data and forecast information on area seeded, area harvested, yield, production, imports and carry-in stocks from the preceding crop year
- on the demand side, the report provides information on exports, food and industrial use, feed waste and dockage, total domestic use and carry-out stocks.

The hard-data is compiled and reformatted by MISB from the Field Crop reporting series of reports from Statistics Canada and provides the foundation for the analysis and forecasts of the supply and demand situation and outlook which are expected to be realized by the end of the crop year. The report is available in English and French on the AAFC website.

- **Weekly Grain Price Summary** (AAFC website): This weekly report is emailed with the Weekly Grain Market Update internally, discussed below, and subsequently made available to the general public on AAFCs website. For each the main crops, the report provides data on the major domestic and international average prices, at various geographic locations, for the current week, last week and last year average price and numerous crop-year and calendar year comparisons for the major crops. In addition, various macroeconomic data is provided such as the Canada-US exchange rate and petroleum prices. The report is available in English and French.
- **Feed Grain Facts** (AAFC website): These reports provide:
  - the selling price of bulk feed ingredients at selected provincial points throughout Canada, and the cash prices

- replacement values for selected grains, oilseeds and products.

The data is obtained by MISB via telephone/email contract with sellers of grain and grain products. The report is available in English and French on the AAFC website.

- **Weekly Grain Market Update (Internal):** This report is internal and is emailed every week to a number of federal officials. It is an update of the weekly prices and new information that affects the grain industry. It provides an overview of factors and events which have impacted on the situation and outlook for crops. In addition to the cover page which provides a summary, the newsletter has one page for each of wheat, coarse grains, oilseeds, pulses and special crops. The information is obtained from various industry newsletters, internet sites, media and discussions with other stakeholders in the industry. In addition, graphs of the various grain prices are included, as well as the Weekly Grain Price Summary, discussed below. The report is available in English and French on the AAFC website.
- **Grain Production by Province (AYP) (by request):** This information is currently available in spreadsheet format by request. The data is compiled and reformatted by MISB from the Field Crop reporting series of reports by Statistics Canada. Data on area seeded, area harvested, yield and production is available for each of the major crops for each province for each year from 1990 to 2014.
- **Canada: Supply and Disposition (S&D) Tables by Commodity (by request):** This information is currently available in spreadsheet format by request. Information on the various components of supply and demand is available for each of the major crops for each year from 1990 to 2012. The data is compiled and reformatted by MISB from the Field Crop reporting series of reports published by Statistics Canada.”<sup>10</sup>

### 2.2.2.3 Infohort

“Infohort is a dynamic information collection and dissemination system designed to provide current and historical data on horticultural commodities across Canada. The information found within can be used for research or to analyze trends. Using Infohort, users can dynamically generate reports to user specifications. The objective is to provide all components of the horticultural industry with the necessary intelligence so that informed decisions can be made about industry.” The following reports are provided:

- Wholesale Price Reports
  - Daily Wholesale Prices Reports: Provides daily ranges of domestic and imported commodities offered for sale. All quoted prices are supplied by a select surveyed group of wholesalers operating in that specific market. The prices quoted represent the wholesalers 'asking price' to the retail level for a commodity and does not represent any arrangements or deals. The information provides for commodities, varieties, origins, pack weight or count and price range. If price quotations are required for official

<sup>10</sup> Grains and Oilseeds Division, AAFC, “Information Dissemination in Support of Improving Stakeholder Competitiveness and Collaboration”.

purposes, please contact Infohort.

Markets: Montreal, Toronto.

- Weekly Wholesale Prices Reports: Provides the weekly range of domestic and imported commodities offered for sale on Canadian markets. All quoted prices are supplied by a select surveyed group of wholesalers operating in that specific market. The prices quoted represent the wholesalers 'asking price' to the retail level for a commodity and does not represent any arrangements or deals. The information provides for commodities, varieties, origins, pack weight or count and price range. If price quotations are required for official purposes, please contact Infohort.
- Apple Reports
  - Canadian Apple Storage by Type of Storage and Province: This report provides data by growing province and facility type (Controlled Atmosphere, Cold and Common Rooms) as reported by storage operators and represents volumes as of the first day of each month from November to July.
  - Canadian Apple Storage by Type of Storage Variety and Utilization: This report provides data by growing province on Fresh, Juice and Peeler volumes with the storage operators' intentions and represents the holdings as of the first day of each month from November to July.
  - Canadian Monthly Apple Storage Summary by Utilization and Variety: This report provides data by growing province on Fresh, Juice and Peeler volumes for each variety and represents the holdings as of the first day of each month from November to July.
  - Canadian Apple Storage Summary: This report provides data by year and represents the holdings as of the first day of each month from November to July.
- Vegetable Reports
  - Vegetable Storage Holdings: This report provides data by province across Canada as reported by the storage operators and represents volumes as of the first of each month from November to June.
  - FOB Market Prices: These reports provide data for 'Free On Board' prices reported from Canadian producing areas."<sup>11</sup>

#### 2.2.2.4 Earth Observation

AAFC's Earth Observation provides geo-spatial information to clients such as other federal government departments, provincial governments, international organizations, commodity groups, industry, and NGO's. Products include:<sup>12</sup>

- Circa 2000 National Land cover of Canada
- Annual Space-Based Crop Inventory
- Agricultural Land Use Change Indicators

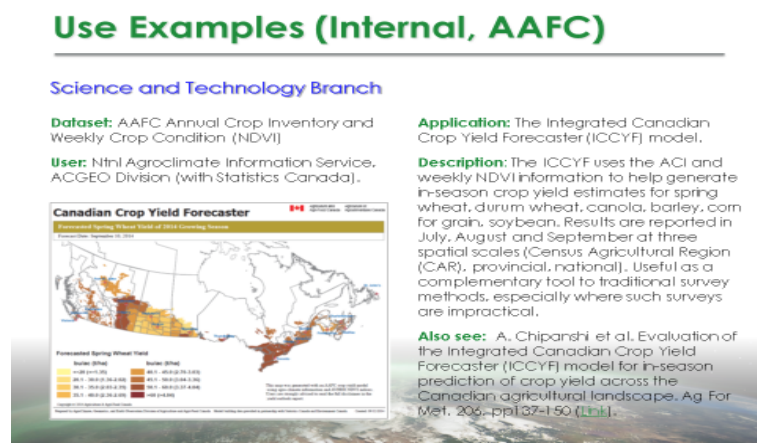
<sup>11</sup> [https://infohort.agr.gc.ca/IH5\\_Reports/contactUs.xhtml?lang=e&pageMenuId=IH5000](https://infohort.agr.gc.ca/IH5_Reports/contactUs.xhtml?lang=e&pageMenuId=IH5000)

<sup>12</sup> "Space for Agriculture: Challenges & Opportunities to supporting a Competitive Agricultural sector in Canada"

- Near-Real-Time Surface Soil Moisture Mapping (Weekly)
- Near-Real-Time Crop Condition Assessment (Weekly)
- Crop Zones and Densities
- Interpolated Crop Yield
- Canadian Crop Yield Forecaster
- Climate-Related Production Risks Committee

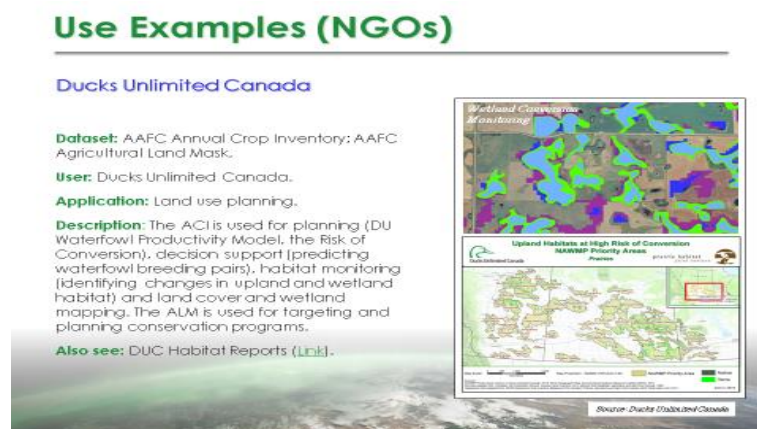
Two applications of AAFC's Annual Space Based Crop Inventory are shown below.

Figure 3: Crop Yield Forecasts



Source: “Space for Agriculture: Challenges & Opportunities to supporting a Competitive Agricultural sector in Canada”

Figure 4: Land Use Planning



Source: “Space for Agriculture: Challenges & Opportunities to supporting a Competitive Agricultural sector in Canada”

Strengths and weaknesses of this data are shown below. Its major weakness appears to be that industry is not completely aware of the data and its power.

**Strengths:**

- Have an incredible capacity to produce data
- The data produced is a public good

**Weaknesses:**

- Communication to the public of the products and their potential is weak
- Access to better formatted data is lacking, but they are working on web applications so public can use data easily

### 2.2.3 Canadian Grain Commission

The Canadian Grain Commission (CGC) provides the following data:<sup>13</sup>

- Grain handling
  - Grain Statistics Weekly
    - Information on primary elevator deliveries, shipments, stocks, and condo storage by crop by province
    - Information on process elevator deliveries, shipments, amount milled, and stocks by crop by province
    - Producer car shipments by crop by province
    - Terminal elevator receipts, stocks, disposition
    - Feed grain deliveries and shipments by province
    - Imported grain receipts, shipments by port
  - Grain Deliveries at Prairie Points
    - Information on producer deliveries to producer cars, to process elevators, to primary elevators, to primary elevator points
- Exports
  - Exports of Canadian Grain and Wheat Flour
    - Exports of Canadian Grains and Wheat Flour: A monthly and crop year to-date review of grains, oilseeds and wheat flour exported to country of destination. Includes port and sector points of exit.
  - Canadian Grain Exports
    - An annual review of the exports of Canadian grain and wheat flour. Includes additional data relating to major specialty grains, grade/class identifications and a review of major costs associated with moving grain to export positions.
- Grain elevators
  - Grain Elevators in Canada
    - Listing of licensed elevators
  - Tariff Summaries

<sup>13</sup> <http://www.grainscanada.gc.ca/statistics-statistiques/sqdm-msdq-eng.htm>

- Elevator Tariff Summaries: A list of maximum tariffs (fees) that licensed grain companies charge for elevating, cleaning, drying and storing grain.
- Varieties by acreage
  - Grain varieties by acreage insured
- Quality data
  - Cereals: Wheat, Malting barley
  - Oilseeds: Canola, Flaxseed, Mustard, Soybeans - Food-type, Soybeans - Non-food grade
  - Pulses: Beans, Chick peas, Lentils, Peas

Data is collected via regulatory powers. As a condition of license for country, terminal, and process elevators, facilities must provide information on grain deliveries, shipments, stocks, producer cars, and exports.

Strengths and weaknesses of the data are shown below. The grain industry is the primary user of the CGC data. The CGC doesn't collect data on container stuffers and has found grain dealers don't always report. It also has no data on direct exports to the US by farmers.

#### Strengths:

- CGC provides the timeliest and complete statistics on activities by licensed grain facilities
- CGC provides exports by destination and port of clearance

#### Weaknesses:

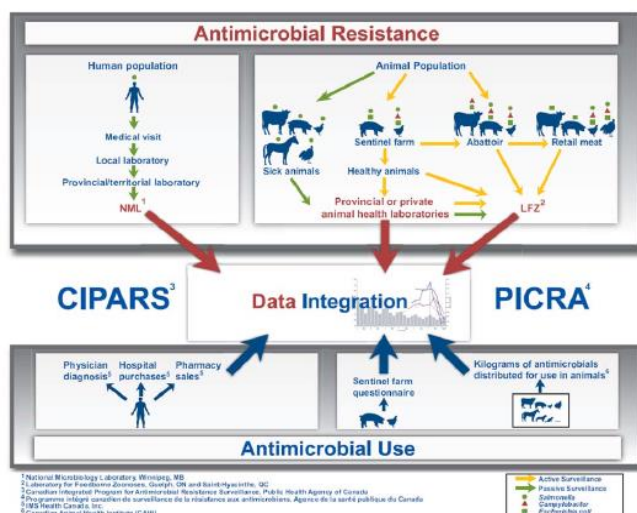
- There is not widespread awareness of quality data (what's released and what must be requested)
- Confusion is created because the CGC and Statistics Canada do not measure the same exports
- The release of annual products is viewed by some as being too slow

## 2.2.4 CIPARS

“The Canadian Integrated Program for Antimicrobial Resistance Surveillance (CIPARS), created in 2002, is a national program dedicated to the collection, integration, analysis, and communication of trends in antimicrobial use (AMU) and resistance (AMR) in selected bacteria from humans, animals, and animal-derived food sources across Canada. This information supports (i) the creation of evidence-based policies for AMU in hospitals, communities, and food-animal production with the aim of prolonging the effectiveness of these drugs and (ii) the identification of appropriate measures to contain the emergence and spread of resistant bacteria among animals, food, and people.”<sup>14</sup> The Public Health Agency of Canada is responsible for this program.

<sup>14</sup> Public Health Agency of Canada, “Canadian Integrated Program for Antimicrobial Resistance Surveillance (CIPARS) – Annual Report 2013”.

Figure 5: Overview of CIPARS



Source: Public Health Agency of Canada, “Canadian Integrated Program for Antimicrobial Resistance Surveillance (CIPARS) – Annual Report 2013”

AMR surveillance by CIPARS is summarized in the following table.

Table 3: AMR Surveillance by CIPARS

	Vet Sample	On Farm	Abattoir	Retail Meat
<b>Broiler/Poultry</b>	Salmonella	Salmonella E. coli Campylobacter Antimicrobial Use	Salmonella E. coli Campylobacter	Salmonella E. coli Campylobacter
<b>Swine/Pork</b>	Salmonella	Salmonella E. coli Antimicrobial Use	Salmonella E. coli Campylobacter	E. coli
<b>Cattle/Beef</b>	Salmonella		E. coli Campylobacter	E. coli

Strengths and weaknesses of CIPARS are shown below. Industry identified gaps in coverage in beef and pork and no coverage for aquaculture and sheep as weaknesses of the program.



**Strengths:**

- The program is able to evolve to fill changing information needs and gaps.
- It provides regional and temporal trends with respect to AMR/AMU. This enables the development of evidence based policies for the preservation of antimicrobial drugs and controls for AMR.

**Weaknesses:**

- Does not include sheep or aquaculture
- Coverage needs to be expanded to include sow barns and nurseries
- Surveillance should be enhanced in beef at abattoir, retail, and on-farm levels

## 2.2.5 Fisheries and Oceans Canada (DFO)

Fisheries and Oceans Canada (DFO) provides data on the aquaculture and seafood sectors. Its data for these and related sectors are shown below.<sup>15</sup>

- **Aquaculture:**
  - Value Added: Sources of output (sales of aqua products/services, operating revenue, etc.); Product inputs (feed, processing costs, operating expenses, etc.); Gross value added (factor cost); and Selected primary inputs (salaries and wages, interest, etc.)
  - Production volumes and values by species
  - Economic and employment contribution to Canada
- **Commercial Fisheries:**
  - Value and Volume of landing by sea fisheries by species by province
  - Value and Volume of landing by fresh water fisheries by species by province
  - World Harvest by country
- **Information on recreational fishing**
- **Trade data:**
  - By major market and country
  - By product group
  - By species group and species
  - By province
- **Maritime Sector in Canada Summary Tables:**
  - GDP by industry
  - GDP contribution to provincial economy 2012
  - Employment by industry and year, 2006 to 2012
  - Direct, Indirect and Induced GDP, 2012
  - Employment contribution to provincial economy, 2012
  - Direct, Indirect and Induced Employment, 2012
- **Regional Statistics**
  - Pacific
  - Central and Artic

<sup>15</sup> <http://www.dfo-mpo.gc.ca/stats/stats-eng.htm>

- Quebec
- Gulf
- Maritime
- Newfoundland and Labrador

The data provides information on aquaculture and seafood at regional and national levels. The seafood sector raised concerns about the data's collection and dissemination as well as about its quality.

Strengths and weaknesses of the data are shown below.



Strengths:

Provides information at various levels of aggregation

Weakness:

Seafood sector has concerns about the collection, dissemination and quality of the data

## 2.3 Canadian Industry Sources

Canada's agri-food sector also provides data to help with business decisions. This section provides information on a very small subset of data provided by industry. Two of the data sets discussed below compile and report on data voluntarily provided.

### 2.3.1 CanFax

CanFax is a division of the Canadian Cattlemen's Association and has provided market information for over 40 years. Products include the following:

- The Canfax Weekly Report (published every Friday) includes cash prices of cattle across Canada, outlook commentary, slaughter statistics, wholesale beef prices, and US cattle information.
- The Daily Snapshot Report includes current fed cattle prices and commentary (Alberta and US) as they happen, and key commodity futures prices.
- The Monthly Trends Report is a feedlot break-even analysis providing actual and projected breakevens on steer & heifer calves, yearlings and shortkeeps.
- Weekly Slaughter and Grading Report, a comprehensive report on Canadian slaughter and grading statistics (federally inspected packing plants only) on specific grades of slaughter cattle. This report also includes carcass weights and breakdown by animal type, all separated by province or region. Each weekly report includes data for the current week and year to date totals in Excel format.
- Quarterly Report, commentary and charts discussing inventories, trade, cattle prices, feed grains, slaughter, grading, beef production and current industry issues.
- The Monthly Price and Grading Report provides provincial cattle prices (including feeder, fed and cow prices) and comprehensive slaughter and grading statistics (federally and provincially inspected packing plants) on specific grades of slaughter cattle. This report also includes carcass weights and breakdown by animal type, all separated by province or region. Each monthly slaughter and grading report includes data for the current month and year to date totals in Excel format.<sup>16</sup>

Canadian prices for fed cattle reported by CanFax are voluntarily submitted by producers. Strengths and weaknesses are shown below.

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<sup>16</sup> <http://www.canfax.ca/SampleReports.aspx>

**Strengths:**

- Provides a snapshot of average wages by province by position.

**Weaknesses:**

- Information is historic and thus not as useful as current information.
  - By collecting from producers vs. packers, the data includes exports and avoids the confidentiality issue with only two packers, so that regional price reporting can be maintained
  - Canfax has been able to sustain Voluntary Price Reporting with feedlot support for over 40 years
  - The VPR principles followed by Canfax protect individual feedlot confidentiality
  - Information is timely, with fed market updates available throughout the week by Canfax and a weekly average reported on Friday afternoon
  - Market transparency
  - Data is available to be used as a base price for other pricing mechanisms as well as price insurance and disaster relief programs (CCA, "Price Discovery Task Force")

**Weaknesses:**

- Can result in skewed reporting (encourages reporting only low prices to trigger a pay out).
- Has limited participation (don't want to be market makers).
- Excludes grid base prices, formula and forward contract information.
- Reduced volumes of cash cattle have: discouraged individuals to report, as they may "stand out"
- In an effort to protect individual trades or due to agreements with packers, prices are not reported. Once this trend starts, the habit of reporting prices is quickly lost even when those reasons are removed.
- Criticism has been raised that the cash trade is so small, that it is not capturing the high and low ends of trade. Feedlots say the high is missed and packers say the low is missed.
- Increased confidentiality concerns by feedlots that do report. Raised questions on if there is incentive for feedlot to only report low or high prices to make programs "work" for them.
- Auction market reporting in Eastern Canada does not consistently represent quality cattle with extremely wide ranges in weekly trade.
- Feedlot reporting in Eastern Canada is extremely limited (CCA, "Price Discovery Task Force")

### 2.3.2 Canadian Nursery Landscape Association (CNLA)

"CNLA, in partnership with its 10 Provincial Associations, collected relevant wage rate data to provide industry-driven Labour Market Information (LMI) to employers, employees, the provincial associations, educators and government agencies. This information is instrumental to the following sectors – nursery stock growers, landscape operations and retail garden centres."<sup>17</sup> A sample of the information, which is voluntarily provided, is shown in the following table.

Position	Average Base Hourly Wage, Nova Scotia
Garden Centre or Nursery Manager/ Grower	
Landscape Manager	\$19.70
Supervisor	\$21.50
Landscape Designer	\$28.80

Below are some of the strengths and weaknesses of the data.

<sup>17</sup> <http://www.wagesurvey.ca/index.htm>

### 2.3.3 Grain Monitoring Program

“Quorum Corporation provides the government with a series of regular reports relating to the system’s overall performance, as well as the effects of the various policy reforms enacted by the government since 2000. In a larger sense, these reforms were expected to alter the commercial relations that have traditionally existed between the primary participants in the GHTS: producers; the Canadian Wheat Board; grain companies; railway companies; and port terminal operators. Using a broad series of indicators, the government’s Grain Monitoring Program (GMP) was designed to measure the performance of the GHTS as this evolution unfolded. Moreover, these indicators are intended to reveal whether grain is moving through the supply chain with greater efficiency and reliability.”<sup>18</sup> The broad performance indicators that are monitored are 1) production and supply; 2) traffic and movement; 3) infrastructure; 4) commercial relations; 5) system efficiency and performance; and 6) producer impact. Information is provided on a weekly, monthly, and annual basis. Some of the information is provided under regulation.

Weekly reporting covers the following areas: country and terminal stocks; railway car supplies; port unloads; shipments, and vessel lineups. Monthly data provides information on production and supply; traffic and movement; system efficiency and performance; commercial relations; and infrastructure. The annual report is a more thorough analysis of the information provided in the monthly reports.

Strengths and weakness are shown below. Prior to the establishment of the Grain Monitoring Program, there was very little data pertaining to the grain handling and transportation system in Western Canada.

### 2.3.4 Canadian Organic Trade Association

The Canadian organic industry collects good data through the certification process which includes most channel members up to retail sale. There are approximately 20 different certification bodies accredited under the Canada Organic Regime. The Organic Roundtable has established a data working group.

The Canadian Organic Trade Association (COTA) is a primary source for information about Canada’s

#### Strengths:

- The data is free
- The information is quite comprehensive and goes back to 1999-2000

#### Weaknesses:

- GMP data is historical and thus may not be as useful as that provided by the Ag Transportation Coalition
- Some question the accuracy of the data provided by the railways
- Some caution must be used in comparing its statistics to statistics by other agencies/organization

<sup>18</sup> Quorum Corporation, “Monitoring the Canadian Grain Handling and Transportation System – Annual Report 2013-14 Crop Year.”

organic sector. Each year it publishes a supplement in the *Globe & Mail* about the organic sector. COTA also commissions research reports and provides them to its members.

Each year the COTA reports on the organic sector in a “for-fee” report.<sup>19</sup> Information is provided on the following:

- Producer numbers
- Land under production
- Processors/handlers
- Organic milk production
- Market demand
- Regulatory matters

Information is provided on the organic sector in North America in the same publication (acreage, acreage share, and land use). This report notes that the data in the report is from certifiers and provincial organizations and is provided voluntarily. “Data inconsistencies and harmonization are the main challenges encountered in the annual data collection. It will remain a weakness until a mandatory national data system is prioritized and implemented by authorities.”<sup>20</sup>

Strengths and weakness are shown below. As discussed below, there is no authority to compel the certification bodies to release data to the sector and no regulatory authority for the CFIA to collect and release this data.

#### Strengths:

- Data is current and relevant

#### Weaknesses:

- Voluntarily provided data means that some data may be missing
- Differences in data preparation and definitions can result in inconsistent or misleading data
- CFIA has no authority to collect and release data from the certifiers
- The data is not transparent or easily accessible

## 3.0 Data Trends

This chapter provides an overview of changes in technology such as remote sensing, big data and the Internet of Things (IoT) and their implications for agriculture, data collection and national statistical agencies.

<sup>19</sup> This report is contained in FIBL & IFOAM – Organics International (2016): *The World of Organic Agriculture 2016*.

<sup>20</sup> FIBL & IFOAM – Organics International (2016): *The World of Organic Agriculture 2016*.

### 3.1 Remote Sensing

A trend with applicability to agriculture is remote sensing which is *“the science (and to some extent, art) of acquiring information about the Earth's surface without actually being in contact with it. This is done by sensing and recording reflected or emitted energy and processing, analyzing, and applying that information.”*<sup>21</sup> “In agricultural uses, remote sensing can produce meaningful measurements of factors like air and soil temperature, humidity, crop height, plant width and diameter, wind conditions, and more. Remote sensing devices are generally installed on equipment such as global positioning satellites, UAVs (unmanned aerial vehicles - also known as drones), and other forms of data collecting aircraft like blimps and balloons. The use of remote sensing in agriculture can provide farm operators with precision maps, crop scouting capabilities, information to aid in crop care, and more.”<sup>22</sup>

According to Andrew Davidson of AAFC's Earth Observation, the technology associated with remote sensing and satellite engineering is advancing rapidly. This will result in 1) “the launch of new EO instruments with enhanced capabilities; 2) provide data continuity and long term data records; 3) drive a new generation of scalable and spatially explicit agro-environmental (AE) indicators; and 4) improve the output of process-based models.” Improved data access, international collaboration and consistent methodologies for data validation will be enabled by open data archives. Data acquisition, processing, and storage will be improved by the centralization of data processing. These changes will have practical applications for Canadian agriculture such as early season crop acreage estimates, improved yield forecasts, and farm management information.<sup>23</sup>

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<sup>21</sup> <http://www.nrcan.gc.ca/earth-sciences/geomatics/satellite-imagery-air-photos/satellite-imagery-products/educational-resources/9363>

<sup>22</sup> <http://www.farms.com/precision-agriculture/remote-sensing/>

<sup>23</sup> Andrew Davidson, “Space for Agriculture: Challenges & Opportunities to supporting a Competitive Agricultural sector in Canada”.

### 3.2 Big Data and the Internet of Things

Two of the hottest trends in information technology/management are the Internet of Things (IoT) and big data (see the box for definitions).<sup>24</sup> While the internet began as a way to connect people, it is rapidly beginning to connect machines/devices to provide economic and health benefits. Big data, although difficult to deal with, can provide benefits in terms of solutions.

**Internet of Things (IoT):** The McKinsey Global Institute defines it as “sensors and actuators connected by networks to computing systems. These systems can monitor or manage the health and actions of connected objects and machines. Connected sensors can also monitor the natural world, people, and animals.” This definition excludes “systems in which all of the sensors’ primary purpose is to receive intentional human input.”

**Big Data:** As defined by the McKinsey Global Institute, it “refers to datasets whose size is beyond the ability of typical database software tools to capture, store, manage, and analyze.” This doesn’t include a size dimension as this will change over time and vary by sector

Reimsbach-Kounatze, OECD provides the following statistics/thoughts about this:

- The global volume of digital data will increase 40 fold from 2010 to 2020.
- Machine-to-Machine (M2M) communication is a key characteristic of the IoT and “describes the process where data is communicated to other machines including a central computer.”
- There are over 30 M interconnected sensors (including smartphones).
- A tidal wave of data is being produced by RFID in conjunction with sensors connected through the IoT. Datification is still in its infancy. “To datify a phenomenon is to put it in a quantified format so it can be tabulated and analyzed.”<sup>25</sup>

<sup>24</sup> McKinsey Global Institute, “The Internet of Things: Mapping the Value Beyond the Hype”, June 2015 and “Big Data: The Next Frontier for Innovation, Competition, and Productivity”, June 2011.

<sup>25</sup> Reimsbach-Kounatze, “The Proliferation of “Big Data” and Implications for Official Statistics and Statistical Agencies”, OECD, 2015



### 3.3 Implications at the Farm Level

These three trends are helping to drive the evolution of agriculture. From BC to about 1920, the “pre-industrial” phase of agriculture, labour intensive operations, low productivity, and small farms characterized agriculture. In the “industrial” phase of agriculture, from 1920 to about 2010, large scale equipment and advanced technology fueled significant gains in productivity. The current phase, “Ag 3.0”, is combining the IoT, big data, and remote sensing in precision agriculture. This will further increase productivity and utilize inputs such as water and fertilizer more efficiently. It will also allow greater transparency as well as make tracking sustainability much easier.<sup>26</sup> Although this example focused on crop production, they are equally applicable in other sectors such as livestock production, bee production, and horticulture.<sup>27</sup>

The Canola Digest recently discussed nine technological changes that will have a significant impact on crop production. Three are directly related to big data and the IoT. These are:

- Data driven decisions: “Using accurate seasonal weather forecasts layered with locational variety performance data, phenotyping of commercial varieties, and farm location, programs can start matching ideal canola varieties to the conditions expected that year.”
- Refined crop scouting: research is underway at AARD to use drones to help manage weeds.
- Sensors: “Sensor technology will automatically detect crop stresses such as nutrient shortages, insect pressure or disease risk so growers can make more knowledgeable and timely decisions on if, when and how to manage these stresses.”<sup>28</sup>

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<sup>26</sup> <http://bits.blogs.nytimes.com/2015/08/03/the-internet-of-things-and-the-future-of-farming/>

<sup>27</sup> <http://www.theguardian.com/technology/2015/aug/05/internet-of-things-connected-cows-agriculture-food-production>

<sup>28</sup> Canola Digest, “Off the Drawing Board: 9 Technologies That Will Change Agriculture”, January 2016.

### 3.4 Implications for Data Collection

These technological changes will provide opportunities for alternative data collection systems. At USDA, National Agricultural Statistics Service's (NASS) field inspectors have been provided with iPads to collect information from farms. The data is then transmitted to a central agency. This system saves between \$3 M US to \$5 M US in printing and mail costs. NASS would like to use the IoT to streamline operations further. By getting data directly from sensors on farm equipment, the need for some surveys would be eliminated. Data ownership and data management challenges will have to be overcome for this to come to fruition.<sup>29</sup>

There are new data sources that can generate close to real time evidence for information and communication technology, prices, employment, economic output, demographics, and development. For example, the "Billion Prices Project" at Massachusetts Institute of Technology scrapes data from online retailers' websites. The data is used to construct a daily online price index which is updated daily and with only a three-day time lag. The Conference Board developed the Help Wanted Online data series for the US. It "measures job offers advertised online at the national, regional, state and metropolitan levels at a detailed (6-digit) occupational level."<sup>30</sup>

There are limits and risks associated with big data including the following:<sup>31</sup>

- Poor quality data can be the result: Data quality is defined as "fitness for use in terms of user needs". Dimensions of quality are relevance, accuracy, credibility, timeliness, accessibility, interpretability, and coherence.
- Inappropriate use of data and analytics: For example, one study showed that the market share of the Ford Explorer was highly correlated with the murder rate in the US.
- Changing data environment: It is possible to "game" data analysis.

**There is potential to integrate prescriptive farming data (or precision agriculture data) with public data at the landscape level** which in turn could support science-based land policy and sustainable management in the agriculture sector.<sup>32</sup> The overall concept is shown below.

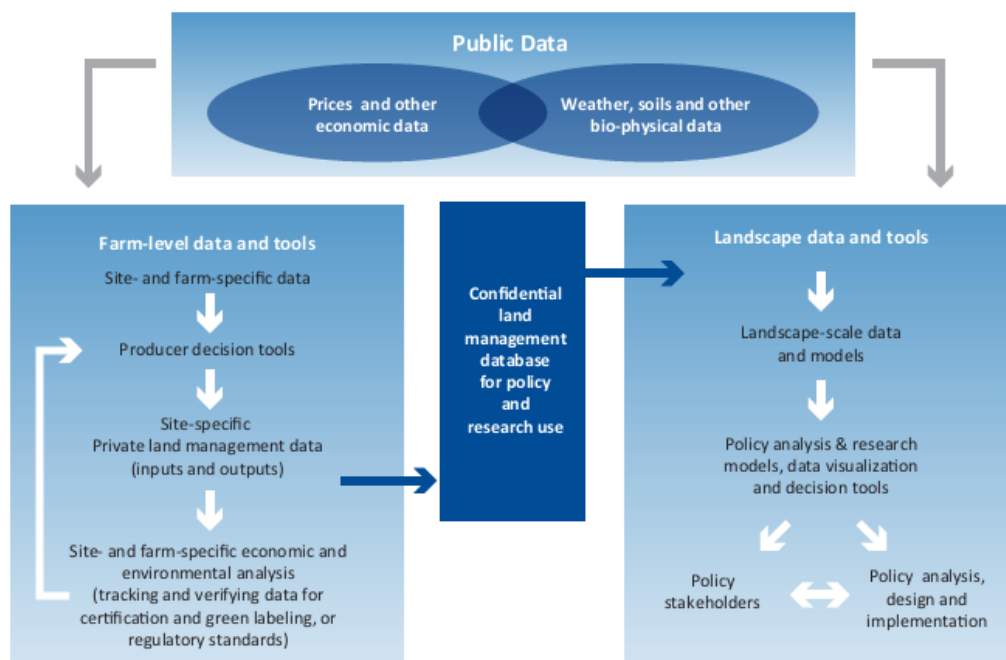
<sup>29</sup> <https://gcn.com/blogs/emerging-tech/2015/01/agriculture-iot.aspx>

<sup>30</sup> Reimsbach-Kounatze, "The Proliferation of "Big Data" and Implications for Official Statistics and Statistical Agencies", OECD, 2015

<sup>31</sup> Reimsbach-Kounatze, "The Proliferation of "Big Data" and Implications for Official Statistics and Statistical Agencies", OECD, 2015

<sup>32</sup> Antle J, Capallo S, and Houston L, "Towards a Knowledge Infrastructure for Science-Based Policy and Sustainable Management of Agricultural Landscapes", AGree, 2014 and Antle J, Capallo S, and Houston L, "Using Big Data to Evaluate Agro-Environmental Policies", Choices, 3<sup>rd</sup> Quarter 2015.

Figure 6: Linkages between Data and Decision Tools at Farm and Landscape Level



Source: Antle J, Capallo S, and Houston L, “Towards a Knowledge Infrastructure for Science-Based Policy and Sustainable Management of Agricultural Landscapes”, AGree, 2014

Farm level data and tools include smart phone apps, Cool Farm Tool, an online GHG emissions calculator, and the Integrated Farming System SM which is a Monsanto product which provides field by field recommendations to optimize inputs and improve sustainability. Landscape level tools include REAP, a simulation model developed by USDA which estimates the impact of economic conditions and policy on regional agricultural production and incomes and SWAT (The Soil and Water Assessment Tool) which can predict environmental impacts of land use and management practices.

While either a voluntary or a mandatory approach could be used to build the new data infrastructure, the authors argue that a voluntary approach would be more acceptable socially and politically. A voluntary approach could produce quality data if participants have an incentive to provide good data. Such a system could benefit both producers and governments. Mutual benefits include the following:

- “Enhance landscape modeling with real-time access to detailed longitudinal data
- Make it easier to share outcomes with producers
- Simplify documentation of farm activities for both regulators and the supply chain by creating data storage for food safety records, weed and pesticide applications, and production information
- Make it easier to document individual or regional improvements in environmental quality at the landscape scale. Reduce data duplication and the cost of data acquisition, storage, and analysis

- Reduce the “respondent burdens” of the present system of multiple mail-based and personal interview surveys.
- Information could be updated and shared in a far more cost effective and time-saving way, through mobile or web-based technologies.”<sup>33</sup>

Challenges associated with this approach include the requirements for data confidentiality and privacy. It also may be difficult to achieve the correct statistical representation but monetary compensation or cross compliance could increase participation.

The authors suggest a public/private partnership approach to support the development and testing of these data systems.

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<sup>33</sup> Antle J, Capallo S, and Houston L, “Using Big Data to Evaluate Agro-Environmental Policies”, Choices, 3<sup>rd</sup> Quarter 2015.

### 3.5 Implications for National Statistical Organizations

**Big data has implications for statistical agencies and statistical policy.** *“Torrents of data streaming across public and private networks are a growing reality and increasingly a wide variety of organizations are mining these data to produce statistics in areas that were previously the undisputed domain of National Statistical Offices (NSOs). While private data suppliers have existed for centuries, what is new is the growth and improved quality. A networked world has almost eliminated the gap between collection and publication, allowing continuous data collection and enabling the collection of large samples that approach the population in some cases. While the displacement of the NSOs as the source of the base data is not (yet) occurring, the use of non-traditional sources to “now cast” this base is becoming increasingly common. The confluence of technological, social and economic trends suggests that this shift is likely to grow quickly in a short period of time. As policy makers begin to experiment with these new sources and statistics and their expectations begin to change as regards to standards of timeliness, detail and frequency, the scenario of “bad data pushing out good data” becomes more likely. Concurrent with this shift are tightening budgets and declining response rates (Groves, 2011) that compel NSOs to explore how best to harness this phenomenon in their mission to supply quality statistics for improving economic performance and social welfare. There is no turning back.”<sup>34</sup>*

How should National Statistical Organizations (NSO) deal with big data? The following are four questions associated with this:

- “Should NSOs take on a new mission as a trusted third party whose role would be to certify the
- statistical quality of these new sources?
- Should NSOs become a “clearing house” for statistics from non-traditional sources that meet
- their quality standards?
- Should NSOs use non-traditional sources to augment (and perhaps replace) their official series?
- Should NSOs issue statistical “best practices” in the use of non-traditional sources and the mining of “big data”?”<sup>35</sup>

<sup>34</sup> Reimsbach-Kounatze, “The Proliferation of “Big Data” and Implications for Official Statistics and Statistical Agencies”, OECD, 2015

<sup>35</sup> Reimsbach-Kounatze, “The Proliferation of “Big Data” and Implications for Official Statistics and Statistical Agencies”, OECD, 2015

## 4.0 Data Gaps

This chapter is about data gaps. It begins with a general discussion of them, followed by an overview of previous data gap examinations in Canada's agriculture and food sector. An inventory of data gaps that were identified through interviews are presented along with their impacts and industry priorities to deal with them. The final parts of the chapter look at current initiatives by industry to close data gaps; best practices, and how technology may assist in data gap closure. It concludes with a brief discussion about the success of the current initiatives in closing data gaps.

### 4.1 Overview

Data/information gaps are more than just missing data and can arise in other ways including the following:<sup>36</sup>

- Inaccuracy or unreliability
- Untimeliness
- Inaccessibility or non-transparency
- Incoherency between sources or in time series

Data gaps can occur for various reasons. For example, changes in industry structure and conduct have resulted in data issues. Because markets evolve rapidly, data issues are a growing challenge.

- The end of single desk marketing resulted in wheat and barley producers requiring more extensive data. "There is currently no publically available information available on vessel line ups, terminal unloads, or forward export sales. Farmers have been asked to operate in an open market environment but have not been given the information needed to make informed decisions. This is in stark contrast to the information made publicly available in the U.S. grain markets."<sup>37</sup>
- Markets and how they work change over time. In the North American cattle market, there has been consolidation in the retailers, packers and feedlots and an increase in the size of operations. Pricing has changed from live basis to rail basis and premiums and discounts are used to adjust for quality. The use of alternative market mechanisms has grown significantly. In 2013, grid cattle and contract cattle represented 29% and 48% of sales respectively compared to 17.6% and 7.3% respectively in 2008. These alternative mechanisms have prices generally based on the cash market which has thinned and may be dominated by poorer quality cattle.<sup>38</sup>

<sup>36</sup> This list is partially drawn from Statistics Canada which has a very detailed view of data quality. (Agricultural Division, Statistics Canada, "Agriculture Statistics Program Review", August 2012)

<sup>37</sup> APAS, SWDC, SBDC, and SPG, "Producer Recommendations on the Future of Canada's Transportation Act", December 2, 2014

<sup>38</sup> Canfax Research Service, "Price Discovery: A Literature Review", April 2014.

- Research by Poon and Weersnick and Poon et al have identified gaps in Canadian agricultural data for policy analysis generally attributable to increasing heterogeneity and complexity of farms.<sup>39</sup>

**Inaccurate data can have economic implications.** Biases and errors in crop production forecasts by USDA and Statistics Canada can cause market swings. Statistics Canada, according to industry experts, typically underestimates the size of the canola crop in its July forecasts while USDA tends to overestimate the size of the US closing stocks of soybeans.<sup>40</sup>

**There are two perspectives on data/information gaps which, while related, provide different insights.**

The **first perspective**, with its roots in microeconomic theory, views informational/data problems as a source of market failure which **“occurs when markets systematically and substantially fail to allocate resources to their most valuable use”**.<sup>41</sup> As shown below, market failure can occur when there are public goods, externalities, market power, and imperfect information. Information/data problems can arise in public goods, and more obviously, in imperfect information situations. Free information regarding crop conditions provided by Statistics Canada is an example of a public good. In the case of public goods, it is not possible to exclude someone from consuming the good or service and use by one person does not change the amount available for another person. Public goods may be under-provided without government intervention. One type of imperfect information is asymmetric information. According to the Prairie Oat Growers, the Canadian rail freight system has several informational problems including asymmetric information, a lack of transparency, and issues associated with timeliness. “The current system of access to information is highly asymmetrical. The railways have all of

**Information is essential for markets to function efficiently.** “Markets function best when participants have comparable information and market power. Efforts can be undertaken to enhance competitive signals and, failing this, government regulation can and must be used. Information is required for efficient market operations and much work needs to be done to identify, collect and disseminate information for the industry.” (APAS, SWDC, SBDC, and SPG, “Producer Recommendations on the Future of Canada’s Transportation Act”, December 2, 2014)

“Price discovery is critical for sending the correct price signal from the consumer to the producer. A market whose participants are starved for information will have much wider price dispersion than one that is information rich.” (Ted Schroeder)

Competition, confidence, price information and efficiency are required for the “development and function of an effective market”. The data used by market participants must be timely, reliable and accurate. (FARMCo, “Crop Data and Price Reporting Project: Update for the Grain Value Chain Roundtable”, November 2015)

<sup>39</sup> Poon K and A Weersink, “Growing Forward with Agricultural Policy: Strengths and Weaknesses of Canada’s Agricultural Data Sets”, *Canadian Journal of Agricultural Economics*, Volume 62, 2014 and Poon K, A Weersink and B Deaton, “Demand and Supply Analysis of Farm, Farmer, and Farm Family Data”, *Structure and Performance of Agriculture and Agri-Products Industry Network*, 2011.

<sup>40</sup> <http://www.producer.com/2015/09/statistics-canada-usda-must-improve-accuracy/>

<sup>41</sup> Rama I and Harvey S, “Market Failure and Role of Government in Food Supply Chain”, Department of Primary Industry, Government of Victoria, June 2009.

the available information. The CTA has some, shippers have less than that, and producers have virtually none.”<sup>42</sup>

Figure 7: Market Failure



Source: Rama I and Harvey S, "Market Failure and Role of Government in Food Supply Chain", Department of Primary Industry, Government of Victoria, June 2009.

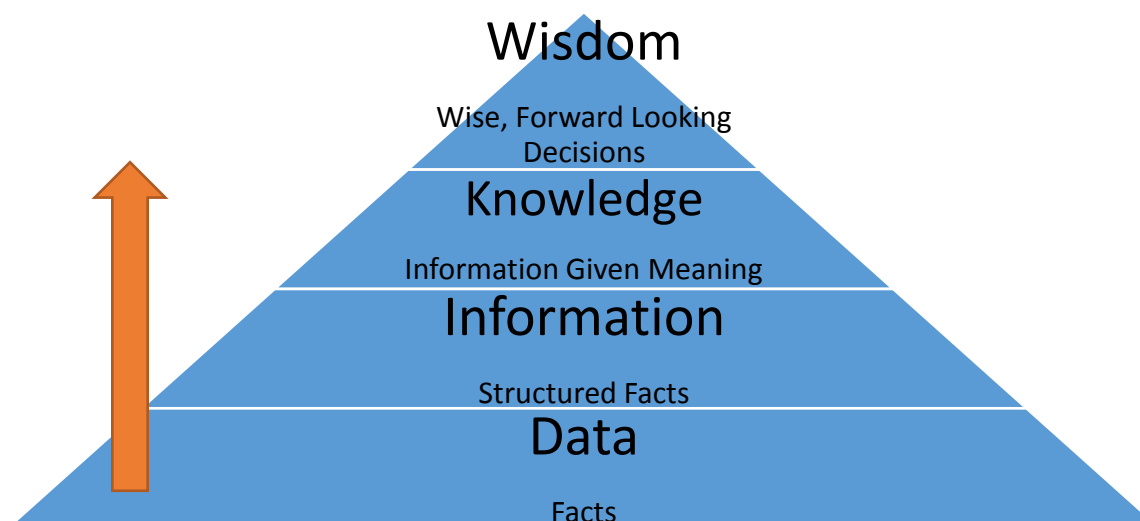
**The second perspective arises from the fields of information technology and knowledge management and links data, information, knowledge, and wisdom in various ways.** The hierarchy between these concepts is often shown in the pyramid form below. Data is at the foundation and includes measurements, statistics, or output from a sensing device. Information occurs when these isolated facts are given context or placed within a structure. Knowledge arises when information is interpreted while wisdom, if reached, results in wise forward looking decisions.<sup>43</sup>

<sup>42</sup> Prairie Oat Growers Association, "CTA Review Submission Building a Grain Transportation System that is Fair, Responsive, Efficient, Transparent", December 2014

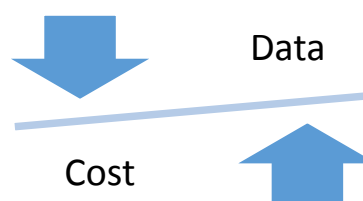
<sup>43</sup> Ahson S and A Shah, "Data, Information, Knowledge, Wisdom: A Doubly Linked Chain?", University of Engineering and Technology, Lahore.



Figure 8: Data to Wisdom



**Both perspectives reinforce the need for data to make sound business decisions. Even in a perfect world some data/information problems will exist because the acquisition and processing of data/information is not costless. Survey burden is a major concern.** Because it is costly to process and supply information, consumers, producers, industry, and governments must determine their optimal balance of information value and collection and processing costs.



“The release of information would improve market transparency, identify segments of the supply chain that are profitable or carry significant risk, improve price discovery and improve supply chain efficiency. Do the gains outweigh the losses? At what point of the supply chain could this data be collected and which organization/government could play a role in disseminating it? If the appetite for additional information exists, which segment of the supply chain is most effective at capturing the data and providing context to the information?” (AARD, “Western Canadian Grain and Oilseed Information and Data Gaps”, February 2014)

## 4.2 Previous Work

This section provides an overview of previous work done by sectors regarding data gaps.

### 4.2.1 Beef

**Canada's beef sector has identified three major reasons why accuracy in current and historical cattle prices is important.** Producers need accurate prices to make marketing, risk management and business planning decisions. Prices are a necessary input in government programs such as income, disaster and price insurance programs. Strategy development and the development of trade cases by industry and government require accurate historical data.<sup>44</sup>

A report by the Canadian Cattlemen's Association examined price discovery in light of the structural changes that have occurred in the market place. Over the last 15 years, the North American market for fed cattle has changed in the following ways:<sup>45</sup>

- Market structure: there has been consolidation and the average size of operation has increased
- Market behaviour: the market was dominated by cash but because of the need to transmit quality information the market shifted to grids, formulas, futures, and packer-owned cattle
- Market information: because of limited price information, transparency was an issue. So in 1999 the US implemented Mandatory Price Reporting (MPR).
- Futures market and risk management strategies are now used

Price discovery is defined as the “process of buyers and sellers arriving at a transaction price for a given quality and quantity of a product at a given time and place”. Price discovery is needed for price determination which is “the interaction of supply and demand which determines the market price level” in order to reach equilibrium.

The usage of Alternate Marketing Arrangements (AMA) is increasing because of margin risk; ability to connect yield and quality information and transmit it through the supply chain; and ability to reduce costs for packers and feeders from enhanced planning and efficiency. Economics dictate what kind of marketing arrangements are used. When supplies are tight, forward contracts are more popular. When there are large premiums on quality cattle, grids are more popular. Cash markets for cattle are thinning in North America.

Market information allows markets to allocate resources to their best use. Markets must communicate consumer demands back to those making decisions. Lack of access to market information has a negative impact on price discovery in cattle markets. “The goal of public data is to achieve as close as possible, equal market information for buyers and sellers. The absence of current market information creates market inefficiencies.”<sup>46</sup>

<sup>44</sup> <http://www.canfax.ca/report/downloads/special/new%20canfax%20price%20reports.pdf>

<sup>45</sup> CCA, “Price Discovery Task Force”

<sup>46</sup> CCA, “Price Discovery Task Force”

In Canada, cash trading has changed. Many trades are on the grid, which means the price is known when the animal is slaughtered with premiums and discounts. Some trades are formula which means that the price is based on a five area average. Also, lower cattle inventories have resulted in fewer cattle marketed. Canada needs enhanced reporting on alternate pricing mechanisms. The Canadian market differs from the US a few different ways. US futures can't be used as a proxy for the cash market because of exchange rate risk; basis risk; and transaction costs which thicken borders. Programs such as price insurance and The Agri-Stability Program and price insurance programs in Canada need cash prices.

The report recommended that price discovery in Canada must meet 1) producers' need for timely information to market cattle; 2) program requirements; and 3) provide information for long-term price discovery analysis and policy needs. Data must be defined consistently. Accuracy and timeliness must be balanced and confidentiality must be addressed. The Agri-Stability Program needs regional calf, feeder, fed and cow prices for breeding and slaughter. The Advance Payments Program needs regional calf, feeder, fed cattle prices and related basis. It also uses future prices. The Western Livestock Price Insurance program needs calf, feeder and fed cattle prices.

The report concluded that encouraging the use of the cash market as the remedy will be ineffective because it doesn't reflect marketing realities. An alternative fed cattle reporting network was proposed:

- Negotiated: cash/spot; know the price when deal is struck; may have premiums and discounts
- Negotiated grid (net): know the base price when the deal is struck but net price is known only after slaughter and premiums and discounts are applied
- Formula (net): base price is based on some other price or value; may not know when the deal is struck; the final net price is determined after premiums and discounts applied
- Forward contract: base price for delivery at a future date (base can be a moving target); final net price includes premiums, discounts and contract terms

Schroeder suggests that in lieu of a reliable cash negotiated fed cattle price and trade, the following information is needed to value fed cattle and to monitor markets: (1) expected cattle supply and demand; (2) expected beef supply and demand; and (3) fed cattle valuation. He also suggested that a data collection system must have the following attributes:

- "Accurate, representative, reliable, and difficult to manipulate
- Strive for as close to 100% of relevant industry firm participation as is feasible
- Auditable and verifiable
- Timely
- Compiled and reported by an independent third party
- Easy, clear, and low cost for firms to provide information
- Easy for industry participants to access and interpret reported information
- Transparent in collecting and reporting procedures
- Sensitive to confidentiality

- Flexible to modify procedures and reporting methods as needed
- Adaptable to make adjustments to process and reported information as needed”<sup>47</sup>

**The beef sector has investigated the impact of data gaps on the Western Livestock Price Insurance Program which needs cash prices in order to create settlement indices and set future coverall levels.**

If data is unavailable, proxies must be used, which can result in delayed payments and/or inaccurate dollars. Proxies also result in more noise in the data which impacts premiums. While the program runs on cash prices, the industry has changed and, during January to October 2015, there were eight weeks of no-cash trades for steers and 18 weeks with no cash trades for heifers. CanFax uses voluntary price reporting but there is no incentive to report prices. Therefore, price reporting should be a program requirement in federal and provincial programs that need cattle price data. This would eliminate the free rider issues and moral hazard would be reduced because other programs besides insurance require prices.<sup>48</sup>

#### 4.2.2 Horticulture

In 2011, the Horticulture Value Chain Roundtable created a working group, **Sector Intelligence Working Group (SIWG)**, in response to the recognition that the sector lacked information. The objective of the SIWG was to “improve the availability of and accessibility to timely, accurate and credible information related to the horticulture value chain which in turn will be translated into greater recognition by stakeholders of the value and diversity of the horticulture sector leading to an improved competitive position and more opportunities for investment and growth.”<sup>49</sup>

The SIWG in collaboration with AAFC conducted an environmental scan of information/intelligence in the horticulture market. Using an online survey tool (Survey Monkey), stakeholders were asked about their demographics; respondent type; sub-sector; data collection and publication; external dataset use; and market intelligence and information challenges.<sup>50</sup>

The study found that, in terms of data collection and publication:

- 47% of respondents collected at least one dataset or compiled one report
- The biggest data collectors were industry associations followed by producers, and provincial entities
- Governments play a major role in data collection and provide the authority for data collection by industry and associations
- The largest share of publications provides information related to volume, acreage, value, or price. Information related to trade, storage inventory, and consumption had the fewest publications.

<sup>47</sup> Schroeder T, “Effective Canadian Fed Cattle Price and Market Information”, June 20, 2014

<sup>48</sup> CanFax, “Beef Industry Data Priorities” November 10, 2015

<sup>49</sup> Horticulture Value Chain Roundtable, “Sector Intelligence Working Group: Terms of Reference”.

<sup>50</sup> SIWG and AAFC, “Report on the Environment Scan of Horticulture Market Intelligence/Information”, November 2012.

- Respondents identified 184 publications. Most data are collected or reported annually, followed by monthly and weekly publications, and then by daily publication.
- The most frequently reported data sources were Statistics Canada, AAFC, OMAFRA, and USDA.
- Accuracy and timeliness were identified as the major challenges with respect to market information/intelligence while cost, relevance, accessibility, and frequency were identified as being less challenging.

#### 4.2.3 Sustainability Data

In 2014, the CCGA, DFC, MPC, and the CCA undertook an examination of the ability of the Census of Agriculture (COA) and the Farm Environmental Management Survey (FEMS) to provide data on sustainability. “As awareness of sustainable agriculture practices and societal interest in sustainable agriculture continues to grow, the importance of environmental indicators that monitor agricultural practices are increasing.”<sup>51</sup>

#### **The work identified the following strengths and weaknesses of the COA and FEMS:**

##### Strengths:

- Provide information on changes to land use (link to environmental risks) and which BMP (Beneficial Management Practice) are being adopted to address the risks

##### Weaknesses:

- FEMS and COA are aligned to governmental boundaries but environmental information is often needed on watersheds or soil types
- Should make data available by watershed
- Statistics Canada sometimes releases data slowly and special requests must be made
- Difficult to access FEMS data
- FEMS excludes farms with ag sales less than \$10,000
- Need to improve response numbers and data quality in FEMS livestock survey

The report suggests secondary surveys and changes to the COA and FEMS and these are shown in the following table.

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<sup>51</sup> CCA and CanFax Research Services, “An Examination of the Census of Agriculture and the Farm Environmental Management Survey on their Ability to Respond to the Growing Need for Sustainable Data to Uphold Canadian Agricultural Competitiveness”, March 3, 2014

Table 4: Changes to FEMS and Census of Agriculture to Improve Sustainability Monitoring

Area	COA	FEMS	Other
<b>Land Use</b>	Add number of acres under conservation easements		
<b>Nutrient Management</b>	Add source of manure applied. Add back some questions regarding area of land by application type, bedding materials	Add questions on acres solid, liquid and semi-solid applied; storage sizes; fertilizer type used and rate of application; soil testing	
<b>Water Quality</b>		Clarify cover crop questions Need acres of wetland drained	Want AAFC data linking COA and FEMS information on watersheds available to researchers
<b>Beef</b>	Need % of land managed with crops rotated winter cover crops and buffer crops. Break out type of stockpiling such as winter grazing, being used on native versus tame pasture. Separate in-field winter grazing and in-field winter feeding. Add forage quality testing and use of over seeding.		
<b>Crops</b>		Data on frequency of crops to help understand crop rotations	
<b>Life Cycle Assessment</b>			Need sector level LCA to evaluate individual commodity impact. Need information such as fertilizer type and amount by commodity and field; fertilizer, pesticide and manure use information by crop, tillage system; on farm fuel use at commodity and field level. For beef, need more information on management of cow-calf operations such as impacts on soil carbon storage from grazing practices.

Source: CCA and CanFax Research Services, “An Examination of the Census of Agriculture and the Farm Environmental Management Survey on their Ability to Respond to the Growing Need for Sustainable Data to Uphold Canadian Agricultural Competitiveness”, March 3, 2014

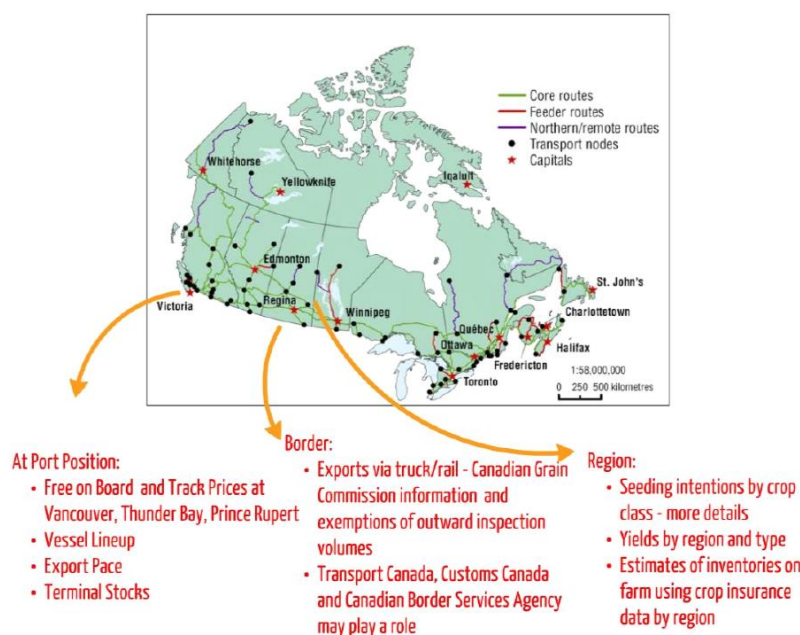
#### 4.2.4 Western Canadian Grains and Oilseeds

**After the move to an open market in Western Canadian wheat, barley and durum, there was some concern that supply chain participants did not have all the information necessary for business, marketing and risk management decisions.** Alberta Agriculture and Rural Development (AARD) met with 20 industry groups during 2013 to identify 1) information/data gaps impacting business decisions;

2) organizations gathering and providing information; and 3) what information other jurisdictions provide and how it is gathered.<sup>52</sup>

Data gaps were identified at ports, at the border, and within regions. The gaps are shown in the following figure.

Figure 9: Data Gaps in Western Canadian Grains and Oilseeds



Source: AARD, “Western Canadian Grain and Oilseed Information and Data Gaps”, February 2014

Many sources of information were identified including AAFC, Statistics Canada, CGC, Grain Monitoring Program, crop insurance organizations, provincial governments, and producer commissions/organizations. The activities of US and Australia in grain regulations were discussed. The US instituted mandatory price reporting at the county level, and the reporting of export sales volumes after 1972, which is when the “Great Grain Robbery” occurred. When the wheat and barley markets in Australia were deregulated, Australia instituted port access and regulatory oversight during the transition. The report noted that calls for mandatory price reporting were not heard.

The report concluded that *“Data and information needs vary within the western Canadian supply chain. Markets function more efficiently with transparent, accessible information along the entire supply chain. There exists a need for collaboration and discussion between provincial and federal ministries, as well as crop insurance organizations to assess the cost and benefit of improving information for western Canadian grain and oilseed producers, brokers, shippers and end users. Improving information will allow*

<sup>52</sup> AARD, “Western Canadian Grain and Oilseed Information and Data Gaps”, February 2014

*the entire supply chain to make more informed business decisions, manage risk and compete in the global grain trade.”*

#### 4.2.5 Agricultural Statistics Working Group

**The Agricultural Statistics Working Group (ASWG) was created by the Grain Value Chain Roundtable to:**

- “Examine the current landscape of agricultural statistics, including the needs of producers and other players in the industry
- Identify gaps in data availability, along with potential options to address the shortcomings;
- Perform outreach activities with the sector to advance the efforts of the Working Group; and
- Collaborate with industry stakeholder groups, public institutions and private organizations to address agricultural data needs.”<sup>53</sup>

This section provides information on two of its initiatives.

##### 4.2.5.1 Survey

The ASWG conducted an online survey about information gaps in the grains and oilseeds sector. Of the 44 respondents, the largest participation was by growers or grower groups (73%) followed by private companies (11%). While most of the responses were from Western Canada, some responses were received from Central and Atlantic Canada. Key findings were as follows:

- “Survey respondents rely on various sources to gather information. The two most used sources are private information providers (55%) and government (50%). Additionally, respondents generate data by reaching out to external and internal contacts, and mining information from media, the Internet and relevant industry associations.
- Respondents are equally concerned with the accuracy, timeliness and level of detail of key data sources. Consistency and credibility of data was also noted as an issue, as the time requirements to pull together, manipulate and fact-check the information can be substantial. Better export information by mode of transportation (i.e. Southern corridor and containerized exports), lack of current and historical pricing data and research and investment figures were highlighted as areas where gaps and weaknesses exist.
- While some new gaps were created with the open market for wheat, 67.5% of respondents indicated that the gaps and weaknesses are longstanding (over 5 years).
- When asked what information was both most valuable and difficult to find, respondents focused on, price (port, basis and spot), production (acres, yield and S/D), exports (sales, volume, pace and corridor), market prospects and trends, specific crop information (pulses, wheat classes and grade,

<sup>53</sup> ASWG Terms of Reference, August 2014



organic and minor/small use crops) and transportation (car orders, performance metrics, producer car/short lines).

- When asked what new data would be useful, a quarter of respondents suggested improvements relating to price reporting, transparency and availability. A popular response was a central, unbiased and public point to house price information. Other survey answers centred on new data requirements relating to transportation, pricing and exports; how information is packaged and shared; enhanced sector specific (wheat classes, livestock, pulses) data; improvements in accuracy and timing of existing production and S/D numbers, and the availability of provincial/regional break-downs.”
- Respondents provided various reasons for why improving existing and generating new information is important for all value chain stakeholders. Improvements would enable stakeholders to make more accurate business decisions, to better understand the operating environment and to improve forward planning (contracting grain, sales planning, transportation, and financial requirements). Many respondents commented on improvements to producers’ profitability, saying stronger information would allow better market timing and ward against price disparities and underselling.”<sup>54</sup>

#### 4.2.5.2 FARMCo Report

FARMCo provided an update on its crop data and price reporting project for the Alberta Wheat Commission (AWC) to the Agricultural Statistics Working Group in November 2015.<sup>55</sup>

One of the rationales for the report for AWC was a Farm Shift survey commissioned by the Alberta Wheat Commission. The survey indicated dissatisfaction with wheat pricing information and that with the open market for wheat, the availability of information has declined.

The Needs Assessment component of the study identified price and data gaps. These are shown in the following table. This assessment found that “respondents wanted to see accurate, unbiased reporting on a more timely basis than what exists currently. Other requests included better forecasting, market analysis and marketing guidance.”

<sup>54</sup> Statistics Working Group – Grain Value Chain Roundtable (GVCR), “Market Information Survey”

<sup>55</sup> FARMCo, “Crop Data and Price Reporting Project: Update for the Grain Value Chain Roundtable”, November 2015

Table 5: Price and Data Gaps

Type and Definition	Examples
<b>Structural: “relate to the manner in which information is collected and disseminated”</b>	<ul style="list-style-type: none"> <li>• Not all buyers can access prices</li> <li>• There are differences in formats and units which makes it difficult to compare prices</li> <li>• There are many sources</li> <li>• There are a lack of statistics on certain types of movements such as export container and truck</li> <li>• Prices that are posted are incomplete. For example, information for some commodities is missing or not all delivery periods are listed</li> <li>• There is no user friendly way to create summaries or to easily customize it</li> <li>• The ICE futures are not used extensively to manage risk</li> </ul>
<b>Temporal; “refer to the timeliness of the data and its relative value”</b>	<ul style="list-style-type: none"> <li>• For market decisions, current information is required</li> <li>• There is a 40 to 50-day delay in the provision of monthly export data with annual data having an even greater delay</li> <li>• Some individual associations provide daily or weekly price data</li> <li>• Deferred pricing information is generally overlooked</li> </ul>
<b>Information: “address the accuracy and completeness of the data”</b>	<ul style="list-style-type: none"> <li>• In general, export price information or bids at ports are not available</li> <li>• Domestic prices can be obtained from most end-users or brokers, but this data isn't publicly available</li> <li>• Information on spot prices and historic basis is lacking</li> <li>• Information is not available for all crops, such as special crops or crops without future markets</li> <li>• Grade and protein spread information is lacking and public can't generally access it</li> <li>• Information on cash grain market prices is in different forms than future prices and freight costs</li> <li>• Because base grades differ by company it is difficult to compare prices</li> <li>• US future market prices are presented in different ways by different companies</li> <li>• Data that is free lacks accuracy so better data has to be purchased</li> </ul>
<b>Competitive Gaps: “refer to the absence of marketing alternatives which creates a potential disadvantage between transacting parties”</b>	<ul style="list-style-type: none"> <li>• Because companies post only their prices, producers must go to several sites to compare prices</li> <li>• Some companies limit the access by farmers to prices outside of their location</li> <li>• Grain buyers generally restrict access to prices so price isn't transparent to all which negatively impacts price discovery and efficient markets</li> <li>• Industry consolidation in the grain industry has reduced the number of trades between companies at export prices which reduces price transparency</li> <li>• Industry consolidation has reduced the number of bids in the market which has reduced the number of information sources</li> </ul>

Source: FARMCo, “Crop Data and Price Reporting Project: Update for the Grain Value Chain Roundtable”, November 2015

US and Canadian data sources were examined. In the US, an export sales reporting requirement has been in place since 1973. Large export sales of designated commodities<sup>56</sup> must be reported the next business day after the sale is made. Exporters must also make weekly reports for all of the designated commodities plus other commodities.<sup>57</sup> The US does not require mandatory price reporting for grain. USDA, does however, provide a wide variety of cash grain prices that are provided voluntarily. Mandatory price reporting is in place for cattle and hogs (since 1999) and for dairy product (since 2010).

<sup>56</sup> Designated commodities: wheat (by class), barley, corn, grain sorghum, oats, soybeans, and soybean meal, cake and oil. Large sales are 100,000 tonnes or more of a single commodity to a single destination in a day or 200,000 tonnes or more of a single commodity during a week. For soybean oil, daily large sales are 20,000 tonnes and weekly large sales are 40,000 tonnes.

<sup>57</sup> These are beef, cattle hide and skins, rice, cottonseed oil, cake and meal, cottonseed, cotton, linseed oil, flax, rye and wheat products.

In Canada, Statistics Canada, AAFC, and the CGC provide crop market information. The report also identified private sector information sources in the US and Canada.

The report identified specific information provided by Statistics Canada, AAFC, and the CGC and any specific issues associated with the use of the data. This information is contained in Annex 6.4.

In its gap analysis, the study identified the following issues: timing, accuracy, comprehensiveness, and export price information in data.

- Timing: coordination and speed
  - Agencies should coordinate reports and publishing dates (provincial governments and their crop reporting)
  - Slowness in reporting, particularly in exports, impact S&D. Better information technology would improve the speed of reporting.
- Accuracy:
  - Some industry participants believe that incorrectly reporting inventory and production benefits them, which in turn impacts the accuracy of surveys. There are issues with respect to accuracy in export reports by the Canada Grain Commission and Statistics Canada. The CGC data covers exports only by licenced grain handlers in Western Canada while Statistics Canada covers both licensed and unlicensed exporters in Western Canada and exports from Eastern Canada. Exports do not always match between Statistics Canada CANSIM and the International Trade Database.
- Detail: export sales commitments, vessel lineups, and comprehensive data
  - Export sales commitments: In the US, export sales must be reported to USDA (the volume, not the value). Large sales (> 100,000 tonnes) are immediately public while smaller sales are amalgamated. The weekly report provides information on the volume sold, destination, class of grain, shipment timing, and whether it is old or new crop. The information provides a level playing field; farmers and small shippers, and all other participants can see the pace of exports and know how much of the crop remains to be sold. **This would be a valuable reporting system to implement in Canada.**
  - Vessel lineups: The Canada Ports Clearance Association used to provide daily information on vessels waiting and loading at port. When the association was disbanded, the Grain Monitoring Program began providing some of this information. However, there is still data missing such as vessel size; type of grain to be loaded, shipper/charterer, and destination.
- Comprehensive data:
  - Data from different agencies does not always match up as the CGC and Statistics Canada export data example shows. Data from different sources is sometimes presented differently. For example, AAFC has four categories in domestic consumption while Statistics Canada has six. Data should be coordinated. This would help to remove data gaps and ensure information is not misleading.
- Export Price Information:

- While some market participants want the price of export sales to be published, disclosure of each sale would likely not be beneficial to the sector. It would harm the competitiveness of exporters and would not help with marketing decisions on the farm. Providing a general sense of values at the port would provide some market information.

The study also concluded that:

- **There is a lack of data on small production crops.**
- **In order to create more meaningful data products, more coordination is required (type of data and timing).**
- **The speed at which data is collected and distributed should be improved through better technology. Improvements in technology would also improve the accuracy of the data.**

### 4.3 Data Gap Inventory

During the consultation phase of the project, 13 value chain roundtables plus the Canadian Agricultural Human Resources Council (CAHRC) were interviewed about data gaps. Also consulted were three federal government departments, one provincial government, and the Grain Monitoring Program. Altogether, 41 interviews were conducted and 63 individuals talked with.

**The interviewees identified 272 data gaps such as missing, inaccurate, less than timely, and inaccessible. After removing double counting in the grains area, the number of data gaps dropped to 223.** As shown below, the sectors with the most data gaps are grains (16%), sheep (13%), and beef (11%). The marketing area had the most data gaps (44%) followed by trade (18%). See Annex 6.5 for the complete set of gaps.

Table 6: Data Gap Summary by Sector & Area

	Number of Data Gaps Identified								Share of Unique Gaps
	Trade	Marketing	Transportation & Logistics	Sustainability	Traceability	Emerging	Other	Total	
Aquaculture	3	1		1		2		7	3%
Bees	2	3						5	2%
Beef	3	12		5	1	4	1	26	12%
Bioproducts	2	9		1				12	5%
Food Processing	2	6					1	9	4%
Grains (Total Gaps)	14	40	22	5	1	1	2	85	
Horticulture	2	12						14	6%
Labour							15	15	7%
Organics	1	6	1	1			2	11	5%
Pork	4	9	1			3	1	18	8%
Pulse	5	3	5	5		0		18	8%
Seafood	2	5		1				8	4%
Seed	0	8		2				10	4%
Sheep	4	16			5	4		29	13%
Special Crops	3	2						5	2%
<b>Total</b>	<b>47</b>	<b>132</b>	<b>29</b>	<b>21</b>	<b>7</b>	<b>14</b>	<b>22</b>	<b>272</b>	
<b>Grains Unique Gaps</b>	<b>9</b>	<b>12</b>	<b>5</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>36</b>	<b>16%</b>
<b>Total With Grains Unique Gaps</b>	<b>40</b>	<b>98</b>	<b>12</b>	<b>21</b>	<b>7</b>	<b>14</b>	<b>22</b>	<b>223</b>	
<b>Share of Unique Gaps</b>	<b>18%</b>	<b>44%</b>	<b>5%</b>	<b>9%</b>	<b>3%</b>	<b>6%</b>	<b>10%</b>		

**Across the sectors, there was a lot of commonality in the kind of data gaps.** For example, in the area of trade, nine of the sectors reported gaps in terms of the amount of detail provided by current trade statistics. Price/sales transparency, supply and disposition, and production estimates were the most common issues raised in marketing data and these were of concern to a majority of sectors. In the area of transportation and logistics, there was concern over whether the GMP and Ag Transport Coalition would exist after 2017. Gaps in the GMP data were also of concern. In the area of sustainability, the chief concerns of seven sectors were the lack of metrics and the lack of data to develop metrics. There were problems with traceability data in the beef, sheep and flax sectors. Social license/public

confidence data gaps were of concern to aquaculture, seafood, and Ontario grain while AMU/AMR/CIPARS issues were raised by aquaculture, beef, pork, and sheep.

Table 7: Hot Areas Identified by Industry

Area	Issue	Sectors
<b>Trade</b>	More Detail	Aqua, Beef, Bioproducts (Biomass), Grains (Oats, Canola, Atlantic), Horticulture, Organics, Pork, Sheep, Special Crops, Food Processing, Seafood
	Frequency/Accuracy	Grains (Canola, Oats, Ontario, Quebec), Pork, Food Processing
	Market Access	Bees, Pulse
	Transshipments	Bees, Beef
<b>Marketing</b>	Price/Sales Transparency	Bees, Beef, Bioproducts (Biodiesel), Grains (Oats, Atlantic, Canola, Flax, QC, Prairies), Horticulture, Organics, Pork, Pulse, Seed, Seafood
	Supply & Disposition (Including Domestic Utilization)	Aquaculture, Bees, Bioproducts (Biomass), Grains (Oats, Flax, Ontario, Prairies), Organics, Seed, Sheep, Special Crops, Seafood
	Production Estimates & Geographic Information	Bioproducts (Biomass), Grains (Flax, Canola, Prairies, Ontario, Quebec, Manitoba), Sheep (lamb crop), Seed, Seafood
<b>Transportation &amp; Logistics</b>	Uncertainty Post 2017	ITA, Pulse Canada, CCGA
	GMP Gaps	Oats, Flax, CCGA, Pulse Canada
<b>Sustainability</b>	Metrics Data to Develop Metrics Certification Difficulties	Aquaculture, Beef, Bioproducts (Biomass), Grains (Flax, Canola), Pulse, Organics, Seed, Seafood
<b>Traceability</b>		Beef, Grains (Flax), Sheep
<b>Emerging Issues</b>	Social License/Public Confidence	Aquaculture, Grains (Ontario), Seafood
	AMR/AMU/CIPARS	Aquaculture, Beef, Pork, Sheep

Issues with data regarding the organic sector were not limited to that sector. A lack of data on organic commodities was also raised by the seed, beef, and grain sectors.

## 4.4 Gaps, Impacts and Priorities

During the March 10th working session, the Business Data Working Group was asked to review the priorities presented. The group did so and made some modifications to their priorities. Data gaps that were identified as being priorities and the impacts of these gaps are discussed in this section. Each area is addressed separately. The complete set of impacts by area and sector is presented in Annex 6.6. See Annex 6.7 for the priorities by sector, by area, and by supply chain participant. The data gap raw data is contained in a separate document.

### 4.4.1 Trade

In the area of trade, priorities are grouped into 1) the greater need for detail in HS codes and 2) the need for improved MRL/market access tools.

**In terms of greater need for detail in HS codes**, this was a high priority for aquaculture, beef, grains, horticulture, pork, seafood, and special crops. It was a medium priority for organics and sheep. The specific needs by sector are as follows:

Aquaculture:

- Data on exports of aquaculture products at the 8-digit level by province and by state is missing. The data exists at the 6-digit level but this level of detail can't identify all farmed species. This data is needed to target US niche markets. Export data on province of origin and state destination are needed to evaluate Agri-Marketing initiatives.
- Data on interprovincial trade flows at the 8-digit HS code level is missing. This data is required for program evaluation and market monitoring.

Beef:

- Maintaining robust export data and having greater detail on primal cuts is important. The insufficient information can distort investment in export.
- The sector noted that CIFA data on transshipments through the US is not available on a timely basis. This also distorts investment in export markets.

Grain:

- Prairie Oat Growers Association (POGA): Inconsistent use of HS codes by some countries makes it difficult to monitor trade agreements and impacts market development. Missing HS codes for human, feed, and other oats makes it difficult to monitor trade agreements and impacts market development.
- Atlantic Grains Council (AGC): Some trade data is aggregated at the Atlantic Canada level and thus doesn't provide information at the provincial level. This makes it difficult to make inferences and difficult to monitor the impact of trade agreements.
- Grain Farmers of Ontario (GFO): Statistics Canada export data for Ontario includes more than Ontario wheat. This makes it difficult to monitor sales.
- Les Producteurs de *grains* du Québec (PGQ): Weekly export and import information for corn in Quebec is missing. Statistics Canada information could be more timely and doesn't always pick

up the origin and destination. The missing data makes it difficult to monitor the progress of crop sales. This information would also improve supply and disposition data.

- Canadian Canola Growers Association (CCGA): Statistics Canada and CGC export data doesn't always reconcile. This makes exports difficult to monitor and affects sales planning.

#### Horticulture:

- More detailed HS codes are required and codes must be maintained. Without detailed data it is difficult to develop niche markets and to respond to special requests for smaller traded products.

#### Organics:

- There are codes for only some organic imports and none for organic exports. The codes that do exist do not always match the US codes. Government programs that require trade data have to make exceptions for the organic sector.

#### Pork:

- CFIA categories and HS codes are misaligned and this impacts planning.
- The proposed reduction in HS codes would impact planning. With new trade agreements, dropped codes could become more important.
- The NES categories for imports and exports by cut are sometimes large in terms of value. This means there is a loss of detail and you can't tell what cuts some importers like Japan are actually importing. With new trade agreements, the large NES category makes it difficult to monitor export performance. Also, without more detailed data, the impact of initiatives is more difficult to measure.

#### Seafood:

- The proposed decrease in HS codes would impact market development and business planning by the sector and others such as the Vancouver airport.
- The NES code is overused which impacts market development and business planning.

#### Sheep:

- Genetic data is incomplete or missing. It is difficult to expand genetic exports without this information.

#### Special Crops:<sup>58</sup>

- Data on hemp fibre exports to the US by state is missing.
- International trade data for buckwheat is missing.
- The import and export data on herbs and spices is incomplete.

**In terms of improved MRL and market access tools**, this was a high priority for the pulse sector and a low priority for the bee sector. The specific needs by sector are as follows:

#### Pulse:

- Access to MRL query tools is limited which impacts efforts to identify and manage trade vulnerabilities around MRLs.

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<sup>58</sup> The special crops sector did not provide any information on impacts. It was assumed that the gaps identified by the sector were all of high priority.



- AAFC is only providing import requirements for high-profile markets. However, the pulse and special crops sectors ship to over 150 countries. The system for identifying pending changes to import requirements from the majority of these countries needs to be improved.

#### Bees:

- Data on market access issues such as MRLs is difficult to access for various countries. The missing information inhibits growth and expansion/diversification of export markets.

### 4.4.2 Marketing

The sectors' priorities for marketing can be grouped into five areas: improved price transparency; improved crop forecasts; improved supply and demand information; improved information on organic commodities; and other information needs.

The first priority area is the need for **improved price transparency**. This was a high priority for bees, beef, grain, horticulture, pork, seafood and sheep and a medium priority for organics and sheep.

Specific needs by sector are as follows:

#### Bees:

- Prices for imported queens and bee packages are not very accurate because some prices include transportation costs to other provinces. Because of this, producers can't compare prices which impacts profitability.

#### Beef:

- Fed cattle prices are impacted by limited volumes and values of cash market transactions. This reduces the quality and robustness of cash prices reported which could impact payouts/premiums for federal and provincial programs.

#### Grain:

- Prairie Oat Growers Association (POGA): There is a lack of transparency in oat prices because of the lack of a centralized site with prices. This impacts producer marketing and profitability.
- Atlantic Grains Council (AGC): The lack of transparency impacts producer profitability. Prices in Atlantic Canada are not transparent which impacts producer profitability.
- Keystone Agricultural Producers (KAP): The lack of prices by geography available online reduces transparency which reduces profitability
- SaskFlax: The lack of transparency in flax prices impacts producer profitability.
- Inland Terminal Association (ITA): The lack of price transparency also impacts business decisions.
- Les Producteurs de **grains** du **Québec** (PGQ): QC input suppliers refuse to participate in input price surveys. This impacts profits.
- Canadian Canola Growers Association (CCGA): More transparency on cash prices and basis for canola is required. The PDQ regions are too large. This impacts the ability to evaluate pricing opportunities and benchmark performance.

**Horticulture:**

- Free on board (FOB) prices for carrots, onions, and potatoes have not been collected since mid-2014. This lack of information impacts marketing.

**Organics:**

- Price data is generally missing although sometimes there is limited information for a single point in time. Price discovery is impacted which reduces market efficiency.

**Pork:**

- Sow price information is no longer transparent. This lack of information makes it difficult for producers to compare prices.
- There is no published feeder/wiener price. The lack of transparency impacts profitability. It also makes it difficult for producers to compare prices.

**Seafood:**

- Information on the price of wild fish is missing. This impacts business planning and the availability of financing for new entrants.

**Sheep:**

- Producers are missing stockyard volumes and prices across Canada. Price information from processors is also missing because of confidentiality/business concerns. Both of these data gaps impact profitability and make it difficult to provide good advice to producers.

**Improved crop forecasts** are a high priority for the grain sector. Specific needs are:

- KAP: Crop forecasts for Manitoba can be inaccurate which impacts supply and demand and transportation planning.
- SaskFlax: Inaccurate crop production forecasts for flax can result in poor decisions.
- ITA: Field crop estimates are not always timely which impacts business decisions.
- GFO: There can be issues with the production, acreage and yield data for Ontario corn and wheat in terms of accuracy, timeliness and completeness. This can impact market development.
- PGQ: Accurate and up to date information on crops in Quebec is required. Improved timeliness and accuracy by Statistics Canada would reduce market uncertainty.
- CCGA: There can be issues associated with Statistics Canada's estimates of canola production in terms of accuracy and completeness. This can have an impact on price. It also impacts transportation planning by the canola sector and railways.

**Better information on supply and demand** is a high priority for bioproducts, grain, sheep, and special crops, and a low priority for bees, grain, horticulture and pork. Specific needs are shown below by sector.

**Bees:**

- Data on domestic utilization of honey is needed. Honey isn't a standardized product so you can't tell what type of honey is being consumed. This impacts business decisions and planning.
- Consumer demand trends in domestic markets are missing which makes it difficult to increase returns by specialization and grow the market.

**Bioproducts:**

- There is a lack of data on the location of biomass.
- Hemp acres, yield, and production are not publically available.
- A lack of data on the quality of bioproducts makes commercial transactions difficult.

**Grain:**

- POGA: Data on oats for feed and processing in Canada and the US is missing which makes it difficult to monitor markets.
- SaskFlax: Data on flax utilization and manufacturing in Canada and the US is not precise which makes it difficult to make market development decisions.
- ITA: Supply and disposition data is not accurate or timely which impacts business decisions.
- GFO: The supply and disposition with domestic end use for Ontario wheat and soybeans is required. The lack of this data tailored for Ontario impacts market development.

**Horticulture:**

- The horticulture sector is missing data for world crops such as bok choy. It is also missing data for production of apples by variety.
- In the wholesale data, some locations have no data because of a lack of wholesalers willing to provide data.
- Storage data may not be accurate because of a lack of participation. This can impact planning and decisions.

**Pork:**

- AAFC identified the following data needs in the pork sector: pork production by month by slaughter; share of slaughter going to further processing; sales by commodity code; and partial condemnations.

**Seafood:**

- Capture and production data from Fisheries and Oceans Canada could be improved in terms of accuracy, accessibility, timeliness, and consistency. Incorrect data can impact public perception. Because some species have a short season the lack of timely information can impact demand.

**Sheep:**

- Lamb crop information is not available throughout the year. This creates uncertainty in the market and impact profitability and productivity. It also makes it difficult for sector organizations to plan.
- The view of the market is impacted by the fact that there is no weekly carcass data. This also impacts decision making.
- Data on cold storage inventory is missing which impacts the view of the market and profitability.

**Special Crops:**

- There is incomplete information on the supply and disposition of herbs and spices.

Horticulture and organics view the need for **better information on organic commodities** as a high priority. The grain sector views it as a medium priority.

**Horticulture:**

- Information on organic horticulture products is missing.

**Organics:**

- Production and acreage data by commodity is provided annually by the organic certification bodies. These approximately 20 bodies do not all use the same methodology or definitions. The provision of data is voluntary so sometimes it is not provided. This makes it difficult to create supply and disposition tables. The lack of good information can impact the growth and profitability of the sector.

**Grain:**

- PGQ: Information on smaller crops like organics is missing. Without this information it is difficult to grow niche sectors and producers won't diversify.

The bioproducts, seed, food processing, grain, seafood, and sheep sectors had some **priority data gaps that don't fit into the previous categories**. Specifically,

**Bioproducts:**

- There is no data on the quality of biomass which makes commercial transactions difficult.

**Food Processing:**

- A complete set of economic and employment multipliers for food processing is missing or difficult to access. This affects government relation efforts.
- A breakdown on AAFC spending that goes to food manufacturing versus producers by program is missing. This impacts government relations.

**Grains:**

- POGA: Inaccurate seeding rates for oats reduces productivity and profitability. The lack of user friendly research reports for oats reduces productivity and profitability. A lack of centralized list for approved varieties and chemicals means that producers have to call each company which adds time. The AAFC report on the oat sector is out of date.
- AGC: Price analysis for Atlantic Canada is missing.
- PGQ: Data on ethanol production in eastern and western Canada is missing which means that producers can't see the demand by ethanol producers. Profits are impacted.

**Seafood:**

- Because there is a lack of information on domestic consumption of wild fish it is difficult to monitor the domestic market.

**Seed:**

- There is no publicly available data for R&D investment by the public sector. Without the whole picture, it is difficult to grow the sector.
- The CWB used to provide robust crop variety acreage surveys. This information is now provided by multiple crop insurance agencies. The information is not as good and is not always comparable across provinces. Profitability and planning are impacted.
- The CSTA provides an estimate of the proportion of acres seeded with certified seed. This data can be inaccurate and difficult to compare over time.

Sheep:

- Comparable cost of production is not routinely collected. Without this data, producers don't have benchmarks for productivity, cost and returns, and marketing/carcasses.

#### 4.4.3 Transportation and Logistics

The grain and pulse sectors identified two high priority data gaps.

The first priority identified is that **the Grain Monitoring Program (GMP) and Ag Transportation Coalition (ATC) could end in 2017**. Specifically,

Grain:

- ITA: Funding for GMP and ATC could end in 2017 which would result in the loss of useful and vital information.

Pulse:

- These programs have provided valuable information for shippers and growers as well as policy makers.

**The second priority is that data gaps in the Grain Monitoring Program on order fulfillment, railway specific data, weekly reporting of grain sales, vessel line up, export pace, port price, and grain movement to the US should be fixed.** Problems with the Ag Transportation Coalition data are also discussed below. Specific needs are as follows:

Pulse:

- Order fulfillment data from GMP and ATC can't be reconciled. Therefore, shippers can't get an accurate view of car order fulfillment.
- In the GMP, there are no railway specific measures and order fulfillment data is not published. A shipper provided measure of demand is not part of the GMP. These limitations are fundamental negatives of the current GMP. There is not enough timely, independent and granular data. Shippers can't use the data for real time logistic management.
- The ATC doesn't cover all grain movement, such as that by container. Data provision is voluntary. These are structural gaps due to program budget limitations. Budgetary constraints also limit further metric development. The program is limited in scope, is not permanent, and doesn't cover all modes.

Grain:

- POGA: Better information on truck movement of oats to the US is needed for planning purposes.
- SaskFlax: Missing information on fax movement to the US in the GMP and ATC makes it difficult to know the percentage of crop sold.
- PGQ: It is difficult to access freight rates for Thunder Bay to Montreal. This makes it difficult to see if there is an incentive for grain to flow into Quebec.
- SK Ministry of Agriculture: Data on FOB and track prices, vessel lineups, export pace, and terminal capacity is missing or incomplete.

- The Grain Monitor: the current order fulfillment measures are not working; weekly reporting of grain sales such as occurs in the US would help with sales and transportation planning; collecting port prices (TRAC) of commodities sold would then allow for a calculation of export basis; and port vessel data on vessel lineup and demand which would help the industry plan. Benchmarking of certain performance metrics in other countries would provide a view of Canadian competitiveness relative to other exporters.

#### 4.4.4 Sustainability

**Aquaculture, beef, bioproducts, grain, horticulture, pork and seafood identified the development of information to measure sustainability as a high priority.** Specific needs are as follows:

##### Aquaculture:

- Complete and up-to-date information on sustainability is required for the aquaculture industry to communicate with the marketplace. Fisheries and Oceans Canada released a report on aquaculture sustainability in 2012. This report was missing indicators for maintaining healthy and productive ecosystem; maintaining animal health and welfare; and ensuring safe and healthy products. This work should continue and the work on the indicators completed.

##### Beef:

- Life cycle inventory information for crops, forage and cow calf operations is needed to calculate measures for GHG and carbon sequestration.

##### Bioproducts:

- Information on the volume of biomass/acre is spotty and this impacts the development of the sector.

##### Grains:

- SaskFlax: There should be standardized metrics for sustainability in flax. There are many possible metrics. It is not clear which ones to use.
- CCGA: The Agri-Environmental report was discontinued which has resulted in a gap in the overview of environmental impacts. Fertility management information is missing. This data is needed to understand GHG and water quality. There is no easily accessible information for energy use during production. This data is needed for life cycle analysis. It is difficult to access water quality and agricultural impact data on a regional basis. This makes it difficult to examine the impacts of farm practices on water quality.

##### Horticulture:

- The horticulture sector requires sustainability metrics and the data to support them.

##### Pork:

- The pork sector requires sustainability metrics and the data to support them.

##### Seafood:

- There are concerns about the accuracy, accessibility, timeliness, and consistency of capture and production data from Fisheries and Oceans Canada. Because certifiers rely on public data it can be difficult to get eco-certification. This increases the cost of certification which reduces profits.

**The seed sector identified the need for more timely information on tillage as a medium priority.** More timely data would help in discussions regarding sustainability.

#### 4.4.5 Traceability

Improvements in traceability were identified as a high priority by the sheep and seafood sectors and as a medium priority by the aquaculture and grain sectors. Specific needs are as follows:<sup>59</sup>

Sheep:

- Movement data is not available for all provinces because of confidentiality concerns and lack of mandatory reporting. This means that the sector is unable to trace movement and is unable to geo-locate co-mingling sites. The fact that manifest data is not electronic also impacts movement tracing. Currently, there is no national database to report to.

Grains:

- SaskFlax: The flax sector is not able to trace seed. In the past this had significant economic consequences for the sector.

#### 4.4.6 Emerging Issues

Anti-microbial resistance/anti-microbial use (AMR/AMU0); social license/public confidence; and the surveillance of production limiting diseases were identified as emerging issues.

**Expanding CIPARS coverage of AMR and adding AMU was identified as a high priority for bees, beef, and pork.** Specific needs are as follows:<sup>60</sup>

Beef:

- Data on AMU needs to be improved as it is not specific enough.
- Data on antibiotic use in cow-calf and feedlots is missing. The sector needs this information to be able to answer questions about social license.

Pork:

- AMU/AMR data is required for sow barns and nurseries.

**Improving regional representation in CIPARS** is a high priority for pork and a medium priority for bees and beef. Specific needs are as follows:<sup>61</sup>

Pork:

- CIPARS data is not representative at a regional level. The quality and usefulness of information provided by CIPARS would be enhanced with better regional representation.

<sup>59</sup> The aquaculture and seafood sectors did not identify their specific needs with respect to traceability.

<sup>60</sup> The bee sector did not specify their needs regarding CIPARS.

<sup>61</sup> The bee and beef sectors did not specify their needs regarding improved regional representation in CIPARS.

The beef sector identified the **surveillance of production limiting disease as a high priority**. The Canadian Animal Health Surveillance System, which is being established, has core principles of practice and organization.

The need for commodity specific data on consumer sentiment for **social license/public confidence** monitoring was identified as a high priority for the grain and horticulture sectors and as a medium priority for the pork sector.

In the grain sector, the GFO identified the need for standardized data for social license/public confidence. A third party could compile and ensure the consistency and comparability of the data over time.

#### 4.4.7 Labour

All the sectors identified the following labour data issues as being high priority:

- The development of methodology and process for commodity specific wages would improve the operation of programs such as the Temporary Foreign Worker Program.
- The improvement of national occupation classification codes would improve the operation of the Temporary Foreign Worker Program and immigration programs.

The productivity of the agriculture and food sector is reduced because of the lack of commodity specific wages and problems with the national occupation classification codes.



## 4.5 Current Initiatives to Close Data Gaps

This section provides information on efforts to close data gaps in Canada, the US, and other countries. It begins with a collaborative initiative at the international level. The sectors were asked to indicate if these initiatives will be, or are successful, at closing data gaps. This assessment is included whenever possible.

### 4.5.1 International

At the international level, global agricultural and food price volatility prompted the G20 to establish the Agricultural Market Information System (AMIS) to “enhance food market transparency and encourage coordination of policy action in response to market uncertainty.” The five main outputs of AMIS are as follows:<sup>62</sup>

- Information collection: collection of statistics and market and policy driver data
- Research: development of methods and indicators to improve forecasts and market outlooks
- Capacity development: initiatives to strengthen the capacity of national data providers
- Dissemination: inform policy makers and other stakeholders of the market situation and outlook
- Policy dialogue: strengthen discussion among policy makers and other stakeholders

Canada is a member of AMIS. Its crop data and Crop Condition Assessment program data meets the AMIS requirements and its livestock data is sufficient.

### 4.5.2 Animal Health and Care

According to the Beef Cattle Research Council (BCRC), disease surveillance and biosecurity is important for the following reasons:<sup>63</sup>

- Trade is globalized
- Emerging and endemic diseases limit production
- Zoonotic diseases, which are diseases that can be spread between animals and humans
- Greater public interest in farmed animals that carry zoonotic diseases (FAO estimates that 70% of recent new infectious diseases originate in animals)
- Migratory birds and other wildlife can carry diseases which challenges biosecurity effectiveness
- Increased demands related to endemic and zoonotic diseases and globalized trade are challenging existing reportable disease programs
- Disease and market access (lack of) significantly decreases economic performance of beef sector

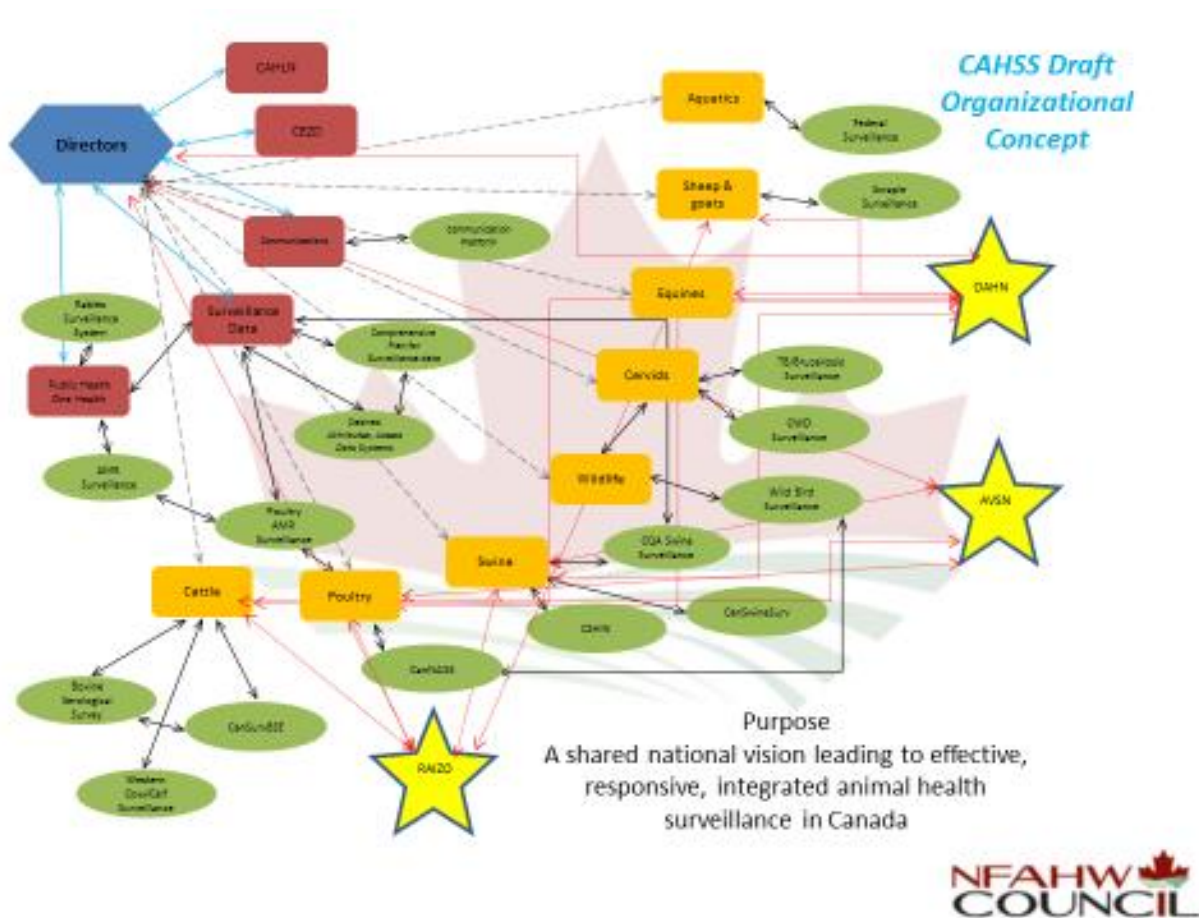
Definition of surveillance: “systematic ongoing collection, collation, and analysis of information related to animal health and the timely dissemination of information so that action can be taken by appropriate parties”. This facilitates risk analysis and decision making (BCRC, “BCRC Animal Health and Welfare Priority Area Review # 3”, November 2015)

<sup>62</sup> Sixth Session of

<sup>63</sup> BCRC, “BCRC A

The Canadian Animal Health Surveillance System (CAHSS) is an initiative that creates “effective, responsive, integrated animal health surveillance in Canada”. Its organization is shown below.<sup>64</sup>

Figure 10 Potential Organization of CAHSS:



Source: Canadian Animal Health Surveillance System (CAHSS), September 2015

It has several projects underway, one of which is surveillance data. This organization wants to 1) reach agreement on data and data system attributes; 2) examine existing system for required attributes; and 3) develop a plan to address gaps.

<sup>64</sup> Canadian Animal Health Surveillance System (CAHSS), September 2015.

**The Western Canada Cow-Calf Surveillance Network, while not yet established, will focus on production limiting disease and vector borne diseases, such as ticks.**

There are challenges associated with surveillance programs. In order to combat low participation, the program must create information that is of value to participants (producers, vets) or else it won't be collected. They are currently trying to increase the value of information in the Western Canada Cow Calf initiative.<sup>65</sup>

**Maple Leaf recently announced that it will improve animal wellness.** The initiative is based on the globally accepted standard of Five freedoms. Freedom from 1) hunger or thirst; 2) discomfort; 3) pain, injury or disease; 4) to express "normal behaviour"; and 5) fear and distress. There will be regular reporting and measurement. It will require hog and poultry operations and suppliers to comply with established animal care codes/programs.<sup>66</sup>

#### 4.5.3 Aquaculture

The aquaculture sector has initiatives underway in traceability, sustainability and social license/public confidence to remedy important gaps in data.

- Traceability: "A functioning traceability system that can identify where a product is at any given time, where it has been prior to its current location, and what was done to it along the way can help preserve all the positive attributes of aquaculture products. A sophisticated traceability system can track finfish from egg to juvenile to adult fish (and feed), through to the marketplace, and shellfish from larvae to seed to final sale. This maintains confidence in Canada's farmed seafood. Traceability is a way of demonstrating and verifying product attributes, but traceability is also an important mechanism for ensuring product safety."<sup>67</sup> Aquaculture has a traceability system in place but is developing a system, **Offspring Traceability, that tracks salmon using their DNA**. The system is being developed by Cooke Aquaculture and at its completion will allow the consumer at the store or at home, to instantly see information about the fish: hatchery, ocean pen, feed, and medical treatments.<sup>68</sup>
- Sustainability: BC Salmon Farmers Association released a report on sustainability which provides metrics for:<sup>69</sup>
  - Environmental sustainability: commitments; fish health; wild salmon conservation, farming and technological innovation
  - Economic Sustainability: contribution to economy; First Nation economies

<sup>65</sup> BCRC, "BCRC Animal Health and Welfare Priority Area Review # 3", November 2015

<sup>66</sup> Maple Leaf, "Maple Leaf's Commitment to Animal Care", December 4, 2015 and Maple Leaf, "Commitment to Animal Care"

<sup>67</sup> DFO's "Aquaculture in Canada 2012: A Report on Aquaculture Sustainability", pages 19-20 <http://www.dfo-mpo.gc.ca/aquaculture/lib-bib/asri-irda/asri-irda-2012-eng.htm>

<sup>68</sup> DFO's "Aquaculture in Canada 2012: A Report on Aquaculture Sustainability", pages 19-20 <http://www.dfo-mpo.gc.ca/aquaculture/lib-bib/asri-irda/asri-irda-2012-eng.htm>

<sup>69</sup> BCSFA sustainability report at [http://bcsalmonfarmers.ca/wp-content/uploads/2015/01/BCSFA\\_SuspReport\\_2015\\_Web.pdf](http://bcsalmonfarmers.ca/wp-content/uploads/2015/01/BCSFA_SuspReport_2015_Web.pdf)

- Social Sustainability: employee base; First Nation partnerships; community engagement; third party certification
- Social License/Public Confidence: The Canadian Aquaculture Industry Alliance (CAIA) issued a social license in aquaculture report in 2014 (unavailable).

#### 4.5.4 Beef

The beef sector has initiatives underway to provide remedies to data gaps related to price transparency and sustainability.

**The first initiative is enhanced price reporting which is being driven by changes in the marketing of cattle. It was implemented in October 2014.**<sup>70</sup>

**The new system involves new formula and base contract prices.** *“To enhance market information, and ensure the industry has the most relevant market information for decision making and analysis, Canfax is launching an enhanced price reporting system. This includes both new Formula and base contract prices. The contracts will provide both volumes and prices or basis levels for forward sold fed cattle, by each month the cattle are committed to. Formula sales will be reported post slaughter, once a final settlement on the cattle is known. These prices will be the price received at the plant, after all discounts and premiums have been accounted for, and will therefore be easily comparable for domestic sales. US formula cattle will also be collected for comparison as well. Formula cattle are cattle sold with a base price that is not specifically known at the time the cattle are committed because the base price comes from other sources, such as the plant average, 5 area average, or another value determining mechanism. US research using data from the Mandatory Price Reporting system shows that the formula prices closely follow the cash market, since the base price is generally linked to the cash market. This new price series will add further depth and robustness to the current cash market information Canfax collects.”*<sup>71</sup>

While the enhanced price reporting provides coverage of alternative marketing arrangements, it is still voluntary. There remains limited incentive to participate, consequently, while total volumes have tripled from the cash only levels, they are still low. It is still recommended that price reporting become a program requirement for all programs that need prices to operate.

The sector also has initiatives underway to address data gaps in sustainability. The Canadian Roundtable for Sustainable Beef’s verification committee will be **building on the McDonald’s Pilot Project**. Modules for biosecurity, animal care and the environment are currently being added to the **Verified Beef Production** program which can be tracked through BIXS.

<sup>70</sup> <http://www.canfax.ca/report/downloads/special/new%20canfax%20price%20reports.pdf>

<sup>71</sup> <http://www.canfax.ca/report/downloads/special/new%20canfax%20price%20reports.pdf>

McDonald's Canadian Verified Beef Pilot Project: "We are working with the Canadian Cattlemen's Association, the Canadian Roundtable for Sustainable Beef, Alberta Beef Producers, Alberta Cattle Feeders and numerous other Canadian beef cattle experts to run a pilot project to demonstrate and verify the sustainability of our Canadian beef supply. This is being accomplished through transparent collaboration, communication and celebration of the great work done throughout the beef supply chain in Canada. The Canadian Pilot Project is designed to enable Canadian beef producers to demonstrate their commitment to sustainable beef production through a self-assessment process followed by independent third party ranch, feedlot and processor on-site verifications by the uniquely qualified professionals at Where Food Comes From. [www.wherefoodcomesfrom.com/](http://www.wherefoodcomesfrom.com/). The first wave of on-site verifications began in May 2015 and verifications will carry on till March 2016. The pilot project will conclude in April 2016 after which learnings from the project will be shared with the Canadian Roundtable for Sustainable Beef (CRSB) and other interested industry stakeholders. Our aim is to transition the pilot to the CRSB who will then develop it into a working program suited to the needs of the Canadian beef industry." (<http://www.vsbpilot.ca/>)

#### 4.5.5 Bioproducts

The bioproducts sector faces data challenges in terms of the location of biomass. **The Bio-Resource Information Management System (BRIMS) will help identify biomass locations in Alberta.** *"This easy-to-use, web-based resource will identify all potential available sources of forestry and agriculture biomass in the province, in support of stimulating the development of new bio-industrial projects that depend on a reliable source of raw materials."*<sup>72</sup>

Statistics Canada surveyed the sector in 2009. A new study, "Bioproducts Production and Development Survey", is going ahead in the spring of 2016. Statistics Canada will conduct the survey on behalf of AAFC.

#### 4.5.6 Grain & Pulse

There are several initiatives going on in the grain and pulse sectors. This section provides an overview of initiatives in grains to deal with price transparency issues, an initiative by pulse and grain to improve data about rail transportation, an initiative to calculate sustainability in grains, oilseeds, and pulses, and an initiative about social licence/public confidence.

##### 4.5.6.1 Quebec

In Quebec, there is a lack of data, particularly with respect to grain prices. A few years ago, the Producteurs de grains du Québec (PGQ) set up a system where farmers send grain contracts in and then the organization complies average bids daily. It is funded by producers (paid a 20 cents per tonne levy

<sup>72</sup> <http://www.canadianbiomassmagazine.ca/news/leading-the-industry-forward-4459>

to establish system – computer costs and staff; now cost is 15 cents per tonne) and supported by provincial regulation.

By posting local grain market prices, The Système de recueil et de diffusion de l'information enhances market transparency which benefits both producer and grain buyers. The system helps producers “negotiate a fair price” and “allocate sales over time for optimum marketing”. The steps in the system are as follows:

- “1- Data Gathering: Producers must submit documents confirming grain sales before 5 p.m. on the business day following the sale.
- 2- Compilation: Data are compiled quickly and confidentially, with staff verifying information with producers if necessary. The resulting high-quality compilations are used to generate tables and graphs on local market trends
- 3- Dissemination: Producers can go online at any time to check immediate-or future-delivery sales prices\* (all values are FOB) for all Quebec regions. Sales data help producers better understand local conditions prior to contacting buyers to sell their grain. The SRDI offers quality, independent information based on real transactions—a great complement to other sources of information. These data are used to analyze local market dynamics. The SRDI allows producers access to long-term sales values. Historical data is available, to track sales price and basis evolution in both Canadian and US dollars.”<sup>73</sup>

According to the PGQ, the strength of the mandatory program is that very high quality price information is collected. A weakness of the system is that because of opposition from the grain industry it is difficult to manage all of the data and relationships. There have been court challenges of the program.

#### 4.5.6.2 PDQ

In response to the need for transparent, timely and accurate cash grain prices the Alberta Wheat Commission established a website (pdqinfo.ca) that provides cash prices for 1CWRS, 1CWAD, 1CPSR, 1CDA Canola and 2 Yellow Peas for nine regions in Western Canada. <sup>74</sup>

The regions in Western Canada were created using parameters such as freight rates; domestic demand; and number and location of buyers. The site now reports basis levels for CWRS, CPSR, and canola which have related futures contracts. The complete set of information available is as follows:

- **“Regional Prices** – The simple average of all spot (current month) prices in a described region. Bid prices are provided electronically by the majority of grain buyers for each buying location. All prices are aligned to a common grade before averaging.
- **Deferred Prices** – The simple average of all deferred delivery prices in a region for each specific calendar month. All prices are for the same grade as the spot regional prices.

<sup>73</sup> Producteurs de Grains du Quebec, “Market Transparency: It Pays Off”, August 2015.

<sup>74</sup> <http://www.pdqinfo.ca/news>

- **Deferred Basis** – The difference between the PDQ calculated average regional prices and corresponding futures contracts, applied to all delivery positions, spot and deferred.
- **End of Day Futures** – Open, High, Low and Closing Prices along with the Change from the previous day for selected futures market commodities. Price information is posted once daily, after market settlement.
- **Base Grade** – This is the specific grade and quality of a commodity represented by the price posted on the PDQ site. IE 1 CWRS Wheat 13.5% protein.
- **Grade Spreads** – The average premium or discount for various grades of grain relative to the PDQ base grade. Market spreads are collected from numerous buyers from time to time.
- **Forex** – the exchange rate between the Canadian and US dollar displayed as either CDN/US or US/CDN at the user's preference.<sup>75</sup>

The following table shows the price data available.

Table 8: Regional Price Information Provided by PDQ

Zones	Name	1 CWRS 13.5	1 CWAD 13.0	1 CPSR 11.5	1 CDA CANOLA	2 YELLOW PEAS
1	PEACE	\$232.04 +0.91	-	-	\$455.01 +5.85	\$441.64 +0.00
2	N ALTA	\$234.28 +0.47	-	\$197.75 -1.97	\$451.29 +2.90	\$443.80 +0.00
3	S ALTA	\$236.88 +0.02	\$315.24 -0.42	\$185.73 -6.02	\$455.28 +3.92	\$442.48 +0.92
4	NW SASK	\$230.32 +0.45	\$304.61 -0.40	-	\$450.58 +2.76	\$449.48 +0.00
5	SW SASK	\$225.42 -0.03	\$307.38 -0.40	\$172.36 -1.56	\$446.90 +1.40	\$436.22 +0.92
6	NE SASK	\$224.37 +1.51	\$304.47 -0.53	\$180.75 -2.73	\$444.97 +2.59	\$444.11 +0.00
7	SE SASK	\$221.49 +0.27	\$308.43 -0.40	\$179.50 -2.06	\$444.91 +2.08	\$429.62 +0.92
8	W MAN	\$222.54 -0.61	\$312.16 -0.53	-	\$449.35 +3.35	\$461.78 +0.00
9	E MAN	\$234.08 -0.20	-	-	\$455.46 +3.44	

Source: <http://www.pdqinfo.ca/>

According to PDQ, timely, accurate and transparent information on cash grain prices:

- Improves the efficiency of futures markets
- Provides information for marketing and seeding decisions
- Provides market analysts with data
- Facilitates the construction of crop insurance benchmarks as well as benchmarks for price support programs
- Decreases the time required to monitor markets
- Allows for regional price comparisons

<sup>75</sup> <http://www.pdqinfo.ca/>

During the interviews with the grain sector, it was suggested that while PDQ is a good beginning, it does not provide enough data, and the regions are too large.

#### 4.5.6.3 Ag Transport Coalition

The crop year 2013/14 was coined a perfect storm for rail transportation. Prairie producers harvested a bumper crop in 2013. Production in Saskatchewan and Manitoba was up about 34%. The record production contributed to rail service issues. Also contributing to the perfect storm were record cold weather and growing shipments of oil by rail.<sup>76</sup> It was in this environment that the Ag Transport Coalition (ATC) was formed. It “represents the coalition of agriculture associations that have come together to jointly fund a 5-year *Growing Forward 2\** initiative aimed at enhancing the competitiveness of the agriculture supply chain. The Ag Transport Coalition members include the Alberta Wheat Commission, the Canadian Canola Growers Association, the Canadian Oilseed Processors Association, the Inland Terminal Association of Canada, the Manitoba Pulse Growers Association, Pulse Canada, and the Western Grain Elevator Association.”<sup>77</sup>

The ATC publishes a weekly report on railway performance from a grain shipper’s perspective. The weekly report provides a great deal of information including information on the timeliness of weekly car supply; current week railway order fulfillment; unfulfilled shipper demand; and railway dwell times.

A table from a 2015 crop year report is shown below.

Figure 11: Material from Ag Transport Coalition's Weekly Report

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<sup>76</sup> Agadrance, “Off the Rails”, 2014.

<sup>77</sup> [http://www.agtransportcoalition.com/content.php?navigation\\_id=2278](http://www.agtransportcoalition.com/content.php?navigation_id=2278)



	<b>CN</b>	<b>CP</b>
Current Week Hopper Car Demand	3,952	3,773
<hr/>		
Current Week Order Fulfillment		
Supplied for Want Week	3,760	2,770
Current Week Unfulfilled Demand	(192)	(1,003)
% Current Week Orders Supplied	95%	73%

Source: Ag Transport Coalition, “Weekly Performance Update – to Grain Week 24 (CY 2015)”

#### 4.5.6.4 Field Print

A consortium of producer organizations, industry organizations and private and public sector companies has developed a tool ([fieldprint.ca](http://fieldprint.ca)) that allows producers to calculate their sustainability. Major funding is provided by CCGA, GFO, Crop Life Canada, Canadian Fertilizer Institute, and MB Pulse and Soybean Growers.

“The Canadian Field Print Calculator lets individual growers document that their production practices are appropriate and sustainable. Basic information on farming practices, soils, and climate are used to model an individual crop's estimated sustainability on the four indicators. The calculator is very easy to use and only requires some basic information including your location, equipment and time for field operations. From that information, it will give you reports on your field-by-field performance on these indicators: Land Use Efficiency; Soil Erosion Risk; Energy Use; Climate Impact; and Soil Carbon Release “. (<http://www.serecon.ca/resources/calculator>)

It is used by producers and by other supply chain participants to a) provide assurance to retailers and NGOs and for consumer advocacy; and b) to understand their supply chains and how they could be improved. For example, General Mills uses it to ensure that it will have good sources of oats (needs oats to be profitable relative to other crops) as well as for assurance. Another example involves Canadian firms trying to access the EU biofuel market with canola. The canola processors have certified their plants and audited growers. The canola chain of custody must be certified.

The **footprint calculator** could be considered a pre-competitive tool. The **footprint calculator** has the science right, especially for GHG calculations. The tool could be embedded in agronomic tools and machines although data ownership is an issue.

#### 4.5.6.5 SaskCanola

SaskCanola has a video about social licence/public confidence. The objective of the work is to reduce the knowledge gap between producers and consumers.

“License to Farm is a short documentary exploring the role of science, sustainability and food safety in modern agriculture, encouraging farmers to stand up for their right to farm. Growing concern over consumer fear and mistrust of the food system, increasingly limiting government regulations, and the danger of choice becoming limited in production methods sparked the need for this film among SaskCanola stakeholders. This film will serve to propel conversations about social license in agriculture.

Canada is a world leader in agriculture and food production. But farming doesn't look the same as it did a hundred, fifty, or even ten years ago. Farmers are producing more with less, using more efficient and sustainable practices than ever before. So why do consumers carry so much doubt around the way their food is produced? When did fear begin to trump science and fact when it comes to food production – and how do we earn back that valuable consumer confidence?

It is crucial for agriculture – particularly farmers – to take a seat at the table when it comes to conversations about food. Farmers can play a crucial role by engaging in meaningful conversations, opening the doors to their livelihood and building trust with their communities. This powerful documentary explores the truth behind common misconceptions of agriculture production in Canada, while empowering farmers to stand up and advocate for their social license to farm.”

([http://www.saskcanola.com/news/latest\\_news.php?detail=678](http://www.saskcanola.com/news/latest_news.php?detail=678))

#### 4.5.7 Horticulture

The horticulture sector is trying to fill data gaps in wholesale and organic data through the following:

- Trying to recover FOB prices to address data gap
- Statistics Canada is to start collecting organic data
- Outreach by AAFC at trade shows to increase wholesaler participation
- Part of the horticulture sector is monitoring information on crops through a magazine survey

#### 4.5.8 Labour

The Canadian Agricultural Human Resource Council has several initiatives underway to provide more data and analysis about labour. These are as follows:

- Agricultural Supply and Demand Forecast Model: CAHRC is working on a supply and demand model for primary agriculture (no wage data). The model will provide a 10-year forecast of caps/shortages; can be updated (likely around census dates); does not include food processing or agribusiness. In March 2016, CAHRC will release the national numbers and then provincial numbers by commodity
- The Agriculture & Agri-Food Workforce Action Plan, developed by over 60 implementation partners, to address the immediate and ongoing problems of a shortage of workers. The work plan includes the updating of the National Occupational codes and the updating of the methodology for determining wage rates and ensuring that they reflect multi-region operations and collective bargaining agreements. However, there is no planned research/data on primary processing.

- National Agricultural Occupational Framework & Labour Market Support: “This project is specifically designed to clarify a variety of much needed information about core jobs in agriculture and leverage that information to build meaningful support tools to assist the sector to address its labour requirements and ensure the health and sustainability of Canada’s agricultural industry.”<sup>78</sup>

#### 4.5.9 Pork

Western Canadian Swine Health Information Network (WCSHIN) is a data network run out of the western region. A new app has been designed that gives real-time data on healthy and unhealthy animals while maintaining the privacy of farms. The app is replacing a program called SBS which needed an internet connection. The app was launched in 2015 and there are currently about 20 vets using it. WCSHIN is funded by three Prairie pork boards and the sector would like to expand its use to other parts of Canada as well as increase the number of vets using it.

This sector also plans to expand **PigTrace**, its traceability program, to help fill data gaps such as the need for verification of production methods/attributes. Its quality assurance program will also become part of **PigTrace**.

#### 4.5.10 Seed

**The seed sector faced data gaps in terms of information about the structure of its sector.** To fill these gaps, surveys of seed producers and processors were conducted in 2014. Information was gathered on operations, employment, expenses, and investment. This information, as well as ancillary information, was then used to determine the economic impact of the sector. Results were published in the following three documents:

- Seed Sector Value Chain Roundtable, “Canadian Seed Sector Profile”, July 2014
- George Morris Centre, “Economic Profile of the Canadian Seed Sector – Seed Processor Summary”, January 2014
- George Morris Centre, “Economic Profile of the Canadian Seed Sector – Seed Producer Summary”, January 2014

The sector has also been active in the area of **social license/public confidence**. In 2011, CropLife examined the following aspects of social license for the crop protection/plant biotechnology sector:<sup>79</sup>

- Economic activity
- Job generation
- Tax revenue generated

<sup>78</sup> <http://www.cahrc-ccrha.ca/current-research>

<sup>79</sup> CropLife Canada, “Cultivating a Vibrant Canadian Economy: The Contributions of Crop Protection Products and Plant Biotechnology”, 2011

- Affordability of food
- Environment (carbon sequestration, fuel use, and preservation of land)

The study is being updated and will be released in 2016.

#### 4.5.11 Sheep

The sheep sector has initiatives underway regarding traceability and animal care.

- **Traceability:** The sector is trying to implement a traceability system from farm to slaughter (working with TraceCanada). It will cover animal ID, premise ID, movement reporting and tag retirement. Eventually areas such as carcass quality, and inter-provincial movement could be added. The information would be reported on an aggregate basis. The sector can use this information to increase profits and productivity. Different provinces are at different stages in implementing traceability across the supply chain.
- **Animal care:** It is implementing animal care assessment standards and biosecurity and incorporating them into its on-farm food safety program. This will enable producers to verify their actions regarding animal care.

#### 4.5.12 Other Jurisdictions/Industries

Interviews with industry also identified initiatives pertaining to data gaps taking place in other jurisdictions. These include the following:

- **Bees:**
  - In the US, the Honey Board has a levy on domestic production and imports that funds market research.
- **CCGA:**
  - The prairie provincial governments were looking at how to improve data. However, no tangible results were produced.
- **Horticulture:**
  - In the US, there is no publicly available onion storage information. An industry group collects the information and sells it.
- **Labour:**
  - The mining and tourism sectors have supply and demand models.
  - In the UK, LANTRA does occupations standards and careers in agriculture,
  - New Zealand has an occupational framework and everyone has a learning profile.
- **Organics:**
  - USDA has internalized organics. It does an annual survey of producers. The US has HS codes for organic imports and exports although they don't match well with Canada. Its depth of information on domestic production and trade has enabled strategic growth.

- The EU has great data on organic production and markets and the data series are very long. The EU doesn't monitor organic imports and exports.
- **Pork:**
  - In the US, sometimes the largest packers will commission reports on domestic and international markets. These are only available to consortium members.
- **Seafood:**
  - **“Seafood New Zealand** provides a range of services that add value to the New Zealand seafood industry, with one voice on whole-of-industry matters. **Seafood New Zealand** supports seafood companies, retailers, iwi groups, and individual fishers primarily through five sector-specific entities: aquaculture, paua, rock lobster, deepwater and inshore finfish.” (<http://www.seafoodnewzealand.org.nz/about-us/>)
  - Alaska Department of Fish and Game provides timely commercial fishing data.
- **Sheep:**
  - New Zealand: **Beef and Lamb New Zealand** <http://www.beeflambnz.com/about-us/> is a producer-owned organization funded by levies that provides production and market information. It has collected cost of production data for over 20 years; and developed Monitor Farms to distribute, evaluate and increase uptake of new research, information and technology in different regions.
  - England: English Beef and Lamb Executive (EBLEX) has been rebranded as Agriculture and Horticulture Development Board (AHDB) Beef and Lamb. It is a producer-owned organization funded by levies that provides production and market information.
  - American sheep industry has a project called Roadmap to Industry Success that collects information on lambs and product quality

#### 4.5.13 Best Practices

A review of the initiatives currently underway to reduce data gaps identified the following best practices:

- Successful initiatives recognize that voluntary programs require that participants benefit or receive some type of value. If the initiative does not create value for participants, participation will fall, which in turn reduces the success of the program.
- In some areas, such as animal health, a large scale collaborative effort is required to achieve total surveillance.
- Successful initiatives use technology. For example, aquaculture is developing a DNA tracing program for salmon. Statistics Canada will have an entry platform for organic data. The pork sector has developed an app to be used by veterinarians to input data at hog farms using their smart phone. This sector is also building on the functionality of its traceability system in order to provide verification of production attributes.
- Industry makes use of surveys to gather data. The seed sector did this to gather structure, employment and investment information. The beef sector gathers sustainability data from its Western Cow Calf Survey, Forage Survey; and Beef Sustainability Survey.

- The sectors can collaborate to develop and implement initiatives to provide greater information. In grain transportation, grain shippers collaborate to provide timely information on railway performance. Field Print was developed by a producer and industry consortium to provide information on sustainability to producers and industry.

#### 4.5.14 Technology and Data Gaps

This section provides examples of how industry and government are using technology to remedy data issues.

**Remote sensing via satellite** has reduced the cost of getting yield data and reduced the burden on farmers. Statistics Canada and AAFC are collaborating to improve its September crop forecasts by using model-based forecasting which incorporates satellite imagery, July survey results, climate conditions, and past conditions. This approach reduces response burden and provides information sooner than the traditional survey approach and will continue if it proves to be a success.<sup>80</sup> An interview with a Statistics Canada official revealed that this approach has been successful and will continue.

Information and communication technology is benefiting Canada's agriculture and food sector. The ability to **conduct surveys over the Internet is very beneficial**. IT solutions can reduce the burden of administrative data. For example, Cathy Istead suggests that in AAFC's data collection efforts, **voice recognition technology** could enhance data collection by simplifying collection procedures and reducing human error. The pork sector has developed an app to be used by veterinarians to input data at hog farms using their smart phone.

**Canadian Food Inspection Agency (CFIA) is moving to Electronic Service Delivery Program** in 2016 which will eliminate the need for manual data entry. This will help to provide accurate and timely information. If CFIA collaborates with AAFC, some meat export data gaps could be filled. Collaboration involving traceability could provide interprovincial trade data and enhanced slaughter and export data.

**The beef sector operates the Beef InfoXchange System (BIXS)**. "BIXS is a voluntary national internet database designed to store and exchange data linked to an individual animal's unique CCIA/ATQ ID tag number. Through a collaboration between the Canadian Cattlemen's Association and Canadian packers, carcass information for individual animals is being made available to producers in the BIXS database. The current requirement to view carcass information for a specific animal is registration in the Beef InfoXchange System (BIXS) as well as ownership of that animal at some point in its life. Once the CCIA ID is recorded in the BIXS database, a producer will be able to view carcass information for that animal when it becomes available. In the past, a grader working at a larger plant with a moving carcass rail would have approximately 15 seconds to complete the quality assessment using these criteria as well as yield grade determination. With sufficient experience, a reasonably accurate grade could be assigned,

<sup>80</sup> <http://www.producer.com/2015/09/model-based-forecasting-debuts/>

although it would be difficult to take actual measurements of the fat depth or ribeye dimensions to most accurately estimate lean yield percentage. A computer vision system (CVS) utilizes a camera with special lighting to photograph the ribeye at the grading site between the 12th and 13th rib. This photograph is then analyzed by a computer to determine marbling levels as well as accurate ribeye measurements. The CVS also allows the grader to input additional information or to manually assess a grade when a carcass is missplit and accurate analysis by the camera is currently not possible. As CVS equipment continues to become more sophisticated, the ability to predict meat quality and yield will be further enhanced. An additional benefit of CVSs is the ability to capture carcass information electronically and to store the information in the BIXS database for later retrieval by producers.”<sup>81</sup>

In the seed sector, **CSGA moved to electronic filing of crop surveys**. A crop inspector (private sector) logs into the site and enters data which saves time and effort. The seed sector is also **using RFID tags** and readers for supply chain management and traceability purposes. Bayer is just implementing this on canola. It will know in real-time where the product is in the supply chain. The broader industry could adopt this and get better information on traceability and what is where.

**Commodity groups are using remote sensing for verification** required for market access. As shown below, the Canola Council of Canada uses remote sensing to gain access to the EU biofuel market.

Figure 12: Remote Sensing and Canola Verification

## Use Examples (Commodity Groups)

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### Canola Council of Canada (ex. 1)


**Dataset:** AAFC Annual Crop Inventory.

**User:** CCC (with ISCC).

**Application:** Opening the European bio-fuel feedstock markets to Canadian Canola.

**Description:** Every year, the ACI is used by ISCC auditors to help verify that Canadian Canola producers comply with the on-farm sustainability criteria set out in the European Union's Renewable Energy Directive (RED). The ACI is used as a screening function on the RED land clearance / conversion issue (in particular, the conversion of forest and shrubland to annual or perennial crops).

**Also see:** H. Dancho, "A natural fit to fuel Europe", Canola Digest, Nov 2011. [\[Link\]](#).



Source: Andrew Davison, "Applications of AAFC's Annual Space Based Crop Inventory"

<sup>81</sup> <http://www.cattle.ca/assets/BIXS-Carcass-Information-Guide-020613.pdf>

#### 4.5.15 Is Further Work Required?

Industry is able to fill data gaps to some extent. The initiative by the Producteurs de grains du Québec (PGQ) has been successful at increasing price transparency. However, the beef sector's enhanced price reporting initiative will require government support to achieve its objective. The western Canadian grain reporting initiative, PDQ, is viewed as a good start, but not a finished product. Price transparency is difficult to correct without regulatory support.

In the area of trade, industry cannot fill the data gaps. Industry will need assistance in the areas of sustainability, traceability, transportation and logistics, and emerging issues.



## 5.0 Moving Forward – Some Strategic Suggestions

This chapter makes strategic suggestions for dealing with the data gaps identified by Canada's agriculture and food sectors. First, some contextual information about the sector, both current and in the future is presented. Then strategic suggestions are made that are cognizant of the context as well as the impacts and priorities identified by industry pertaining to the gaps.

### 5.1 The Context

**Canada's agriculture and food sector is vibrant and a strong economic performer.** In 2013,

- “The agriculture and agri-food sector generated \$106.9 billion, accounting for 6.7% of Canada's GDP.
- The agriculture and agri-food sector provides 1 in 8 jobs in Canada, employing over 2.2 million people.
- The food and beverage processing industry is the largest of all manufacturing industries in Canada, accounting for the largest share (16.0%) of the total manufacturing sector's GDP in 2013. It also accounted for the largest share (16.7%) of jobs in the manufacturing sector.”<sup>82</sup>

**Trade, both imports and exports, is very important to the sector. New trade agreements promise further growth.** In 2013,

- “Canada was the world's fifth-largest exporter of agriculture and agri-food products after the European Union (EU), the US, Brazil, and China. Canadian export sales grew by 5.5% in 2013 to \$46.0 billion, maintaining its 3.5% share of the total value of world agriculture and agri-food exports.
- It is estimated that approximately half of the value of primary agriculture production in Canada is exported, as either primary commodities or processed food and beverage products.
- The US remains Canada's most important agriculture and agri-food export destination accounting for 50.8% of total Canadian exports. China accounted for 11.2% of Canadian agriculture and agri-food exports and Japan, EU, and Mexico accounted for 17.0% combined.
- With import sales of \$34.3 billion in 2013 – an increase of 6.0% over the previous year – Canada remained the world's sixth-largest importer, accounting for 2.9% of the total value of world agriculture and agri-food imports. The US accounted for 61.4% of the value of all Canadian agriculture and agri-food imports.”<sup>83</sup>

**The domestic market also matters.** In 2013,

<sup>82</sup> <http://www.agr.gc.ca/eng/about-us/publications/economic-publications/alphabetical-listing/infographic-an-overview-of-the-canadian-agriculture-and-agri-food-system-highlights/?id=1428449412987>

<sup>83</sup> <http://www.agr.gc.ca/eng/about-us/publications/economic-publications/alphabetical-listing/an-overview-of-the-canadian-agriculture-and-agri-food-system-2015/?id=1428439111783>

- “Canadians spent \$189.1 billion on food, beverages and tobacco products. This represented the second-largest household expenditure category, after shelter.”<sup>84</sup>
- The Canadian food processing industry sells three-quarters of its products in the domestic market.”<sup>85</sup>

#### **Sustainability is important to consumers and food processors.**

- “Sustainability measures are important to urban consumers. They're becoming well-informed and more discriminating about their food choices, even using smartphone apps to monitor food production. Is sustainability the way we can add more value?”<sup>86</sup>
- “Fifty-five percent of global online consumers across 60 countries say they are willing to pay more for products and services provided by companies that are committed to positive social and environmental impact, according to a new study by Nielsen. The propensity to buy socially responsible brands is strongest in Asia-Pacific (64%), Latin America (63%) and Middle East/Africa (63%). The numbers for North America and Europe are 42 and 40%, respectively. “Consumers around the world are saying loud and clear that a brand’s social purpose is among the factors that influence purchase decisions,” said Amy Fenton, global leader of public development and sustainability, Nielsen. “This behavior is on the rise and it provides opportunities for meaningful impact in our communities, in addition to helping to grow share for brands.”<sup>87</sup>

#### **AMR/AMU, while currently an emerging issue, will become increasingly important and have significant consequences.**

- Impacts of AMR include higher health care costs, mortality and morbidity, and a “return to the pre-biotic age” with bad health outcomes and loss of routine medical procedures.
- “Market pressure and accumulating scientific evidence are going to constrain the sector’s access to antibiotics.”<sup>88</sup>
- On a global basis, 0.7 M die each year from AMR and this number could reach 10 M per year by 2050. Population growth is increasing the demand for food which is resulting in the intensification of livestock production which in turn increases antibiotic use.<sup>89</sup>

#### **Traceability allows Canada’s agriculture and food sector to respond to food safety issues or outbreaks of animal diseases.**

- “**PigTrace** is about improved emergency management. In the event of a food safety issue or foreign animal disease outbreak in the pork sector, traceability gives animal health officials and

<sup>84</sup> <http://www.agr.gc.ca/eng/about-us/publications/economic-publications/alphabetical-listing/an-overview-of-the-canadian-agriculture-and-agri-food-system-2015/?id=1428439111783>

<sup>85</sup> AAFC, “An Overview of the Canadian Agriculture and Agri-Food System”, March 2014.

<sup>86</sup> <https://www.fac-fcc.ca/en/ag-knowledge/technology-and-innovation/consumers-value-sustainability.html>

<sup>87</sup> <http://www.nielsen.com/ca/en/press-room/2014/global-consumers-are-willing-to-put-their-money-where-their-heart-is.html>

<sup>88</sup> Topp E, “Genomics R&D Initiative – Antimicrobial Resistance (AMR)”, Presentation at the Beef VCRT December 10, 2015

<sup>89</sup> BCRC, “Antimicrobial Resistance, Use and Alternatives Research Workshop – Day 1 Summary”, Beef VCRT, December 11, 2015

food safety officials the tools to quickly and effectively contain and deal with the situation. Improved response time reduces the economic impact on the industry, producers and all Canadians.”<sup>90</sup>

**Social licence/public confidence is an emerging issue which could have significant consequences for the agriculture and food sector.**

- “Social licence is the privilege of operating with minimal formalized restrictions (legislation, regulation, or market requirements) based on maintaining public trust by doing what’s right.”
- Public Trust: “A belief that activities are consistent with social expectation and the values of the community and other stakeholders.”<sup>91</sup>

**Technology is becoming increasingly important at all levels of society and the economy.**

- Society is shifting towards a data-driven or data-centric socioeconomic model, commonly called “big data”. “In such a data driven world, data is a core asset that proves a huge new resource for innovation, new industries and applications and competitive advantage. While harnessing this new asset is non-trivial, the continued rapid decline in the cost of analytics, including computer power and data storage, as well as the continued expansion of broadband makes it increasingly within reach.”<sup>92</sup>

**The labour situation in Canadian agri-food could become critical.**

- 2.1 M people are employed in Canada’s agri-food sector
- The average age of a Canadian farmer is 55. Only 8% of farmers are younger than 36 years.
- There will be 73,862 job openings in agriculture, aquaculture and horticulture by 2022. Only one in three of these positions will be filled.<sup>93</sup>

<sup>90</sup> <http://pigtrace.ca/>

<sup>91</sup> Charlie Arnot, Center for Food Integrity, “Values, Trust and Science”, Presentation, 2011

<sup>92</sup> Reimsbach-Kounatze, “The Proliferation of “Big Data” and Implications for Official Statistics and Statistical Agencies”, OECD, 2015

<sup>93</sup> <http://ipolitics.ca/2015/03/09/help-wanted-the-job-crisis-in-canadian-agriculture/>

## 5.2 Strategic Suggestions

This section presents strategic suggestions regarding the data gaps. These suggestions are tied to the priorities delineated by industry.

### 5.2.1 Trade

**Trade data, in terms of HS codes, should be enhanced as they are critical tools for investment, market development initiatives, and business decisions. Reporting should be enhanced so that it meets the needs of industry in terms of timeliness and accuracy.**

Specific needs are as follows:

Aquaculture:

- Data on exports of aquaculture products at the 8-digit level by province and by state is missing. The data exists at the 6-digit level but this level of detail can't identify all farmed species. This data is needed to target US niche markets. Export data on province of origin and state destination are needed to evaluate Agri-Marketing initiatives.
- Data on interprovincial trade flows at the 8-digit HS code level is missing. This data is required for program evaluation and market monitoring.

Beef:

- Maintaining robust export data and having greater detail on primal cuts is important. The insufficient information can distort investment in export.
- The sector noted that CIFA data on transshipments through the US is not available on a timely basis. This also distorts investment in export markets.

Grain:

- Prairie Oat Growers Association (POGA): Inconsistent use of HS codes by some countries makes it difficult to monitor trade agreements and impacts market development. Missing HS codes for human, feed, and other oats makes it difficult to monitor trade agreements and impacts market development.
- Atlantic Grains Council (AGC): Some trade data is aggregated at the Atlantic Canada level and thus doesn't provide information at the provincial level. This makes it difficult to make inferences and difficult to monitor the impact of trade agreements.
- Grain Farmers of Ontario (GFO): Statistics Canada export data includes more than Ontario wheat. This makes it difficult to monitor sales.
- Les Producteurs de **grains** du **Québec** (PGQ): Weekly export and import information for corn in Quebec is missing. Statistics Canada information could be more timely and doesn't always pick up the origin and destination. The missing data makes it difficult to monitor the progress of crop sales. This information would also improve supply and disposition data.
- Canadian Canola Growers Association (CCGA): Statistics Canada and CGC export data doesn't always reconcile. This makes exports difficult to monitor and affects sales planning.

**Horticulture:**

- More detailed HS codes are required and codes must be maintained. Without detailed data it is difficult to develop niche markets and to respond to special requests for smaller traded products.

**Organics:**

- There are codes for only some organic imports and none for organic exports. The codes that do exist do not always match the US codes. Government programs that require trade data have to make exceptions for the organic sector.

**Pork:**

- CFIA categories and HS codes are misaligned and this impacts planning.
- The proposed reduction in HS codes would impact planning. With new trade agreements, dropped codes could become more important.
- The Not Elsewhere Specified (NES) categories for imports and exports by cut are sometimes large in terms of value. This means there is a loss of detail, and limited information on what cuts some importers (Japan) are actually importing. With new trade agreements, the large NES category makes it difficult to monitor export performance. Also, without more detailed data, the impact of initiatives is more difficult to measure.

**Seafood:**

- The proposed decrease in HS codes would impact market development and business planning by the sector and others such as the Vancouver airport.
- The NES code is overused which impacts market development and business planning.

**Sheep:**

- Genetic data is incomplete or missing. It is difficult to expand genetic exports without this information.

**Special Crops.<sup>94</sup>**

- Data on hemp fibre exports to the US by state is missing.
- International trade data for buckwheat is missing.
- The import and export data on herbs and spices is incomplete.

**Access to market access information should be improved.**

The specific needs by sector are as follows:

**Pulse:**

- Access to MRL query tools is limited which impacts efforts to identify and manage trade vulnerabilities around MRLs.
- AAFC is only providing import requirements for high profile markets. However, the pulse and special crops sectors ship to over 150 countries. The system for identifying pending changes to import requirements from the majority of these countries needs to be improved.

<sup>94</sup> The special crops sector did not provide any information on impacts. It was assumed that the gaps identified by the sector were all of high priority.

**Bees:**

- Data on market access issues such as MRLs is difficult to access for various countries. The missing information inhibits growth and expansion/diversification of export markets.

## 5.2.2 Marketing

**The lack of price transparency in Canadian agriculture has a high cost. Industry and governments should work together to enhance price transparency. The effectiveness of current price transparency initiatives should be evaluated in order to determine if they could provide a template.**

Specifically,

**Bees:**

- Prices for imported queens and bee packages are not very accurate because some prices include transportation costs to other provinces. Because of this, producers can't compare prices which impacts profitability.

**Beef:**

- Fed cattle prices are impacted by limited volumes and values of cash market transactions. This reduces the quality and robustness of cash prices reported which could impact payouts/premiums for federal and provincial programs.

**Grain:**

- POGA: The lack of transparency in oat prices because of a lack of centralized site with prices. This impacts producer marketing and profitability.
- AGC: The lack of transparency impacts producer profitability. Prices in Atlantic Canada are not transparent which impacts producer profitability.
- Keystone Agricultural Producers (KAP): The lack of prices by geography available online reduces transparency which reduces profitability
- SaskFlax: The lack of transparency in flax prices impacts producer profitability.
- Inland Terminal Association (ITA): The lack of price transparency also impacts business decisions.
- PGQ: QC input suppliers refuse to participate in input price surveys. This impacts profits.
- CCGA: More transparency on cash prices and basis for canola is required. The PDQ regions are too large. This impacts the ability to evaluate pricing opportunities and benchmark performance.

**Horticulture:**

- FOB prices for carrots, onions, and potatoes have not been collected since 2014. This lack of information impacts marketing.

**Organics:**

- Price data is generally missing although sometimes there is limited information for a single point in time. Price discovery is impacted which reduces market efficiency.

**Pork:**

- Sow price information is no longer transparent. This lack of information makes it difficult for producers to compare prices.

- There is no published feeder/wiener price. The lack of transparency impacts profitability. It also makes it difficult for producers to compare prices.

Seafood:

- Information on the price of wild fish is missing. This impacts business planning and the availability of financing for new entrants.

Sheep:

- Producers are missing stockyard volumes and prices across Canada. Price information from processors is also missing because of confidentiality/business concerns. Both of these data gaps impact profitability and make it difficult to provide good advice to producers.

**Statistics Canada and AAFC should continue their efforts to improve crop production estimates. Technology, such as remote sensing, can play a significant role in this. Better communication between industry and AAFC and Statistics Canada should also be encouraged.**

The specific needs of the grain sector are as follows:

- KAP: Crop forecasts for Manitoba can be inaccurate which impacts supply and demand and transportation planning.
- SaskFlax: Inaccurate crop production forecasts for flax can result in poor decisions.
- ITA: Field crop estimates are not always timely which impacts business decisions.
- GFO: There can be issues with the production, acreage and yield data for Ontario corn and wheat in terms of accuracy, timeliness and completeness. This can impact market development.
- PGQ: Accurate and up to date information on crops in Quebec is required. Improved timeliness and accuracy by Statistics Canada would reduce market uncertainty.
- CCGA: There can be issues associated with Statistics Canada's estimates of canola production in terms of accuracy and completeness. This can have an impact on price. It also impacts transportation planning by the canola sector and railways.

**A proper supply and disposition (S&D) table for each commodity is a necessity and not a “nice to have”. Industry, AAFC, and Statistics Canada could collaborate in the development of robust S&D for crops and livestock commodities. Industry, through collaboration with its members could help statistical agencies develop a methodology for measuring domestic utilization and US utilization. AAFC and Statistics Canada should collaborate and agree on one type of supply and disposition.**

The specific needs are as follows:

Bees:

- Data on domestic utilization of honey is needed. Honey isn't a standardized product so it is difficult to tell what type of honey is being consumed. This impacts business decisions and planning.

Bioproducts:

- There is a lack of data on the location of biomass.
- Hemp acres, yield, and production are not publically available.

- A lack of data on the quality of bioproducts makes commercial transactions difficult.

#### Grain:

- POGA: Data on oats for feed and processing in Canada and the US is missing which makes it difficult to monitor markets.
- SaskFlax: Data on flax utilization and manufacturing in Canada and the US is not precise which makes it difficult to make market development decisions.
- ITA: Supply and disposition data is not accurate or timely which impacts business decisions.
- GFO: The supply and disposition with domestic end use for Ontario wheat and soybeans is required. The lack of this data tailored for Ontario impacts market development.

#### Horticulture:

- The horticulture sector is missing data for world crops such as bok choy. It is also missing data for production of apples by variety.
- In the wholesale data, some locations have no data because of a lack of wholesalers willing to provide data.
- Storage data may not be accurate because of a lack of participation. This can impact planning and decisions.

#### Pork:

- AAFC identified the following data needs in the pork sector: pork production by month by slaughter; share of slaughter going to further processing; sales by commodity code; and partial condemnations.

#### Sheep:

- Lamb crop information is not available throughout the year. This creates uncertainty in the market and impact profitability and productivity. It also makes it difficult for sector organizations to plan.
- The view of the market is impacted by the fact that there is no weekly carcass data. This also impacts decision making.
- Data on cold storage inventory is missing which impacts the view of the market and profitability.

#### Special Crops:

- There is incomplete information on the supply and disposition of herbs and spices.

### **Industry and AAFC should collaborate to produce more market intelligence and analysis for domestic and foreign markets for all commodities.**

#### Specific needs include:

##### Bees:

- Consumer demand trends in domestic markets are missing which makes it difficult to increase returns by specialization and grow the market.

##### Grain:

- POGA: The AAFC report on the oat sector is out of date.



- AGC: Price analysis for Atlantic Canada is missing.

**The seafood sector, Fisheries and Oceans Canada and AAFC should collaborate to improve the collection and dissemination of data for the seafood sector.**

Seafood:

- Capture and production data from Fisheries and Oceans Canada could be improved in terms of accuracy, accessibility, timeliness, and consistency. Incorrect data can impact public perception. Because some species have a short season the lack of timely information can impact demand.

**AAFC, Statistics Canada and the certification authorities should collaborate to produce more information about organics in Canada. The organic sector is valuable but without accurate information, it can be difficult to grow strategically or to monitor.**

Specific needs are:

Horticulture:

- Information on organic horticulture products is missing.

Organics:

- Production and acreage data by commodity is provided annually by about 20 organic certification bodies. These bodies do not all use the same methodology or definitions. The provision of data is voluntary so sometimes it is not provided. This makes it difficult to create supply and disposition tables. The lack of good information can impact the growth and profitability of the sector.

Grain:

- PGQ: Information on smaller crops like organics is missing. Without this information it is difficult to grow niche sectors and producers won't diversify.

**Understanding interprovincial trade flows is difficult without data. The use of traceability systems and big data should be explored as potential solutions to this gap.**

Sectors such as aquaculture, beef and sheep identified issues with interprovincial movement data. It may be beneficial to explore the possibility of augmenting traceability databases to allow the tracking of interprovincial movement.

### 5.2.3 Transportation and Logistics

**The Grain Monitoring Program and the Ag Transport Coalition provide valuable information to the pulse and grain sectors. AAFC and Transport Canada should ensure the funding for these initiatives continues after 2017.**

Specifically,

**Grain:**

- ITA: Funding for GMP and ATC could end in 2017 which would result in the loss of useful and vital information.

**Pulse:**

- These programs have provided valuable information for shippers and growers as well as policy makers.
- The Grain Monitoring Program, AAFC, and Transport Canada should collaborate to fill the gaps in the GMP data that have been identified.

**The Grain Monitoring Program, AAFC, and Transport Canada should collaborate to fill the gaps in the GMP data that have been identified.**

## Specifically,

**Pulse:**

- Order fulfillment data from GMP and ATC can't be reconciled. Therefore, shippers can't get an accurate view of car order fulfillment.
- In the GMP, there are no railway specific measures and order fulfillment data is not published. A shipper provided measure of demand is not part of the GMP. These limitations are fundamental negatives of the current GMP. There is not enough timely, independent and granular data. Shippers can't use the data for real time logistic management.
- The ATC doesn't cover all grain movement, such as that by container. Data provision is voluntary. These are structural gaps due to program budget limitations. Budgetary constraints also limit further metric development. The program is limited in scope, is not permanent, and doesn't cover all modes.

**Grain:**

- POGA: Better information on truck movement of oats to the US is needed for planning purposes.
- SaskFlax: Missing information on fax movement to the US in the GMP and ATC makes it difficult to know the percentage of crop sold.
- PGQ: It is difficult to access freight rates for Thunder Bay to Montreal. This makes it difficult to see if there is an incentive for grain to flow into Quebec.
- SK Ministry of Agriculture: Data on FOB and track prices, vessel lineups, export pace, and terminal capacity is missing or incomplete.
- The Grain Monitor: the current order fulfillment measures are not working; weekly reporting of grain sales such as occurs in the US would help with sales and transportation planning; collecting port prices (TRAC) of commodities sold would then allow for a calculation of export basis; and port vessel data on vessel lineup and demand which would help the industry plan. Benchmarking of certain performance metrics in other countries would provide a view of Canadian competitiveness relative to other exporters.

## 5.2.4 Sustainability

**Much work must be done to produce data that can be used for metrics in the area of sustainability which includes environmental, economic, and social dimensions. Support should be provided for the development of this data.**

Specific needs are as follows:

Aquaculture:

- Complete and up to date information on sustainability is required for the aquaculture industry to communicate with the marketplace. Fisheries and Oceans Canada released a report on aquaculture sustainability in 2012. This report was missing indicators for maintaining healthy and productive ecosystem; maintaining animal health and welfare; and ensuring safe and healthy products. This work should continue and the work on the indicators completed.

Beef:

- Life cycle inventory information for crops, forage and cow calf operations is needed to calculate measures for GHG and carbon sequestration.

Bioproducts:

- Information on the volume of biomass/acre is spotty and this impacts the development of the sector.

Grains:

- SaskFlax: There should be standardized metrics for sustainability in flax. There are many possible metrics and it is not clear which ones to use.
- CCGA: The Agri-Environmental report was discontinued which has resulted in a gap in the overview of environmental impacts. Fertility management information is missing. This data is needed to understand GHG and water quality. There is no easily accessible information for energy use during production. This data is needed for life cycle analysis. It is difficult to access water quality and agricultural impact data on a regional basis. This makes it difficult to examine the impacts of farm practices on water quality.

Horticulture:

- The horticulture sector requires sustainability metrics and the data to support them.

Pork:

- The pork sector requires sustainability metrics and the data to support them.

Seed:

- **The seed sector identified the need for more timely information on tillage as a medium priority.** More timely data would help in discussions regarding sustainability.

**To improve the certification process, the seafood sector, Fisheries and Oceans Canada and AAFC should collaborate to improve the collection and dissemination of data for the seafood sector.**

Seafood:

- Capture and production data from Fisheries and Oceans Canada could be improved in terms of accuracy, accessibility, timeliness, and consistency. Incorrect data can impact public perception. Because some species have a short season the lack of timely information can impact demand.

**Technology will play a large role in sustainability. Precision agriculture and public data could be integrated to support sustainable land management and science-based land policies. A public-private partnership approach to support the development and testing of these data systems should be considered.**

### 5.2.5 Traceability

**Data gaps in traceability can increase the risk associated with an adverse event as well as reduce producer participation in these programs. Smaller sectors may require more support from government in order to implement an effective traceability program. This should be strongly considered.**

Improvements in traceability were identified as a high priority by the sheep and seafood sectors and as a medium priority by the aquaculture and grain sectors. Specific needs include:

Sheep:

- Movement data is not available for all provinces because of confidentiality concerns and lack of mandatory reporting. This means that the sector is unable to trace movement and is unable to geo-locate co-mingling sites. The fact that manifest data is not electronic also impacts movement tracing. Currently, there is no national database to report to.

Grains:

- SaskFlax: The flax sector is not able to trace seed. In the past this had significant economic consequences for the sector.

**The use of technology could expand the benefits and coverage of traceability programs and thus should be encouraged.**

For example, perhaps production attributes could be incorporated into existing traceability databases. This could provide alternative approaches to producer verification. The pork sector is examining this approach.

### 5.2.6 Emerging Issues

**Some sectors lack AMR/AMU data and others have holes in their data. Industry and government should work together to improve AMR/AMU data collection and dissemination.**

Specific needs include:

Beef:

- Data on AMU needs to be improved as it is not specific enough.

- Data on antibiotic use in cow-calf and feedlots is missing. The sector needs this information to be able to answer questions about social license.

Pork:

- AMU/AMR data is required for sow barns and nurseries.
- CIPARS data is not representative at a regional level. The quality and usefulness of information provided by CIPARS would be enhanced with better regional representation.

**Industry and government should start a discussion on social license/public confidence and develop metrics for it.**

The need for commodity specific data on consumer sentiment for **social license/public confidence** monitoring was identified as a high priority for the grain and horticulture sectors and as a medium priority for the pork sector. In the grain sector, the GFO identified the need for standardized data for social license/public confidence. A third party could compile and ensure the consistency and comparability of the data over time.

### 5.2.7 Labour

**The CAHRC should work with Statistics Canada to ensure that the data used in the Temporary Foreign Worker Program is as accurate as possible.**

Incorrect wage data impacts the operation of the Temporary Foreign Worker Program. This impacts Canadian productivity and Canada's competitiveness.

**The CAHRC should enhance its dissemination of its analysis of Statistics Canada's Labour Force Survey and the Job Vacancy and Wage Rate Survey. Greater outreach would also be beneficial.**

**The CAHRC and Employment and Social Development Canada (ESDC) should collaborate to improve National Occupation Classification codes.**

Inaccuracies in these codes impact the Temporary Foreign Worker Program as well as immigration programs.

**Research to determine labour needs in primary processing plants should be encouraged.**

### 5.2.8 Enablers

The implementation of the strategic suggestions made in this section can be improved through the following enablers:

**Improved outreach with respect to existing data and its use and data solutions such as remote sensing would be beneficial.**

Improved outreach would help build industry capacity with respect to data and its utilization. Remote sensing has great potential but industry is not fully aware of how it can be used to provide or enhance data.

**Continued strong dialogue between Statistics Canada and AAFC is important and should be strongly encouraged.**

**There are and will be opportunities to collect data using technology and these should be pursued. Having a single technology/system to collect data from producers would reduce response burden and costs.**

**The Business Data Working Group (BDWG) has shown that there is value for both the agricultural sectors and Statistics Canada in having a greater connection to discuss data needs to drive progress and investment decisions. Industry representation should be enhanced in Statistics Canada's Agricultural Statistics Advisory Committee. Statistics Canada should consult with industry to implement the recommendations under its scope in this report.**

## 6.0 Annex

### 6.1 Interviews

VCRT	BDWG Member	Designated Interviewee	Interview Date
<b>Aquaculture</b>	Carey Bonnell	Doug Blair	01-Feb-16
<b>Bee Health</b>	Rod Scarlett	Rod Scarlett	22-Jan-16
<b>Beef</b>	Brenna Grant	Brenna Grant	05-Jan-16
<b>Bioproducts</b>	Murray McLaughlin	Murray McLaughlin, Sean McKay, Handy Khalil	14-Jan-16
		Stu Porter for biofuels	22-Jan-16
<b>Food Processing</b>	Sylvie Cloutier	Carla Ventin, Elmer Mascarenhas	18-Feb-16
<b>Grains</b>	Catherine Scovil	Catherine Scovil, Janelle Whitley, Cheryl Mayer, Steve Pratte (CCGA)	04-Feb-16
		Shawna Mathieson (POGA)	21-Jan-16
		Chuck Fossay (KAP)	29-Jan-16
		Michael Delaney (Atlantic Grains Council)	27-Jan-16
		Ramzy Yelda, Grain Producers of Quebec	05-Feb-16
		Wayne Thompson, SaskFlax	01-Feb-16
		Lina Urbisci, Todd Austin, and Debra Conlon, Grain Farmers of Ontario	03-Feb-16
		Kevin Hursh and Norman Fodness, Inland Grain Association	01-Feb-16
<b>Horticulture</b>	Luce Daigneault	Brian Render, Jean Mukezangango	21-Jan-16
<b>CAHRC</b>	Janet Krayden/Portia McDonald-Dewhirst	Janet Krayden	11-Jan-16
		Debra Hauer	12-Jan-16
		Ray Bollman	12-Jan-16
<b>Organics</b>	Matthew Holmes	Matt Holmes	07-Jan-16
<b>Pork</b>	Ben Woolley	Ben Woolley, Martin Rice, Cesar Urias	18-Jan-16
		Emily Bond	19-Jan-16
		Mark Ferguson	20-Jan-16
		Jeff Clark	22-Jan-16
<b>Pulses</b>	Lee Moats	Lee Moats	28-Jan-16
		Denis Tremorin	03-Feb-16
		Material from Greg Northey	28-Jan-16
<b>Seafood</b>	Carey Bonnell	Chris Sporer, Christina Burridge	24-Feb-16
<b>Seed</b>	Jeff Reid	Rob Hamman	20-Jan-16
		Jeff Reid, Roy Van Wyk	22-Jan-16
		Nadine Sisk	26-Jan-16
<b>Sheep</b>	Andrew Gordanier	Delma Kennedy, Jennifer MacTavish, Susan Hosford, Virginie Rochet	21-Jan-16
		Corlena Patterson	25-Jan-16
<b>Special Crops</b>	Kelly Dobson/Darcelle Graham	Kelly Dobson	26-Jan-16
<b>Statistics Canada</b>	Greg Peterson	Greg Peterson	26-Jan-16
<b>AAFC</b>		Greg Strain, Rod Myer, Katrin Nagelschmitz, Stephen Desroches	02-Feb-16
<b>AAFC</b>		Cathy Istead (provided information)	28-Feb-16
<b>AAFC</b>		Fred Oleson (provided information)	04-Feb-16
<b>AAFC</b>		Andrew Davidson	10-Feb-16
<b>CGC</b>		Anh Phan, Kevin Morgan	10-Feb-16
<b>Sk Ministry of Ag</b>		David Loewen (provided information)	09-Feb-16
<b>Grain Monitoring Program</b>		Mark Hemmes, Bruce McFadden (provided Information)	26-Jan-16

## 6.2 List of Abbreviations

Abbreviation	Full Name
1CDA	1 Canadian
1CPSR	1 Canadian Prairie Spring Red
1CWAD	1 Canadian Western Amber Durum
1CWRS	1 Canadian Western Red Spring
AAFC	Agriculture and Agri-Food Canada
AAR	American Association of Railroads
AARD	Alberta Agriculture and Rural Development
AHBD	Agriculture and Horticulture Development Board
AID	Animal Industry Division
AMA	Alternate Marketing Arrangements
AMIS	Agricultural Market Information System
AMR/AMU	Anti-Microbial Resistance/Anti-Microbial Use
APAS	Agricultural Producers Association of Saskatchewan
ASWG	Agricultural Statistics Working Group
ATC	Ag Transportation Coalition
AYP	Acreage, Yield, Production
BC	British Columbia
BCRC	Beef Cattle Research Council
BCSFA	British Columbia Salmon Farmers Association
BDWG	Business Data Working Group
BFO	Beef Farmers of Ontario
BIXS	Beef InfoXchange System
BRIMS	Bio-Resource Information Management System
BSE	Bovine Spongiform Encephalopathy
CAHI	Canadian Animal Health Institute
CAHRC	Canadian Agricultural Human Resource Council
CAHSS	Canadian Animal Health Surveillance System
CAIA	Canadian Aquaculture Industry Alliance
CANSIM	Canadian Socio-economic Information Management System
CBOT	Chicago Board of Trade
CBSA	Canadian Border Services Agency
CCAP	Crop Condition Assessment Project
CCGA	Canadian Canola Growers Association
CFIA	Canadian Food Inspection Agency
CGC	Canadian Grain Commission
CIPARS	Canadian Integrated Program for Antimicrobial Resistance Surveillance
CN	Canadian National
CoA	Census of Agriculture
COTA	Canadian Organic Trade Association
CP	Canadian Pacific
CSGA	Canadian Seed Growers Association
CSHIN	Canadian Swine Health Information Network
CSTA	Canadian Seed Trade Association
CTA	Canadian Transportation Agency
CWB	Canadian Wheat Board
DFC	Dairy Farmers of Canada
DFO	Fisheries and Oceans Canada
EBLEX	English Beef and Lamb Executive
EO	Earth Observation
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FEMS	Farm Environmental Management Survey
FFS	Farm Financial Survey
FIPI	Farm Input Price Index
FOB	Free On Board
FPBQ	Fédération des producteurs de bovins du Québec
FPPQ	Fédération des producteurs de porcs du Québec
G 20	Group of Twenty



<b>G&amp;O</b>	Grains and Oilseeds
<b>GEOGLAM</b>	Group on Earth Observations Global Agricultural Monitoring Initiative
<b>GFO</b>	Grain Farmers of Ontario
<b>GHG</b>	Green House Gas
<b>GHTS</b>	Grain Handling and Transportation System
<b>GMP</b>	Grain Monitoring Program
<b>HS</b>	Harmonized System
<b>ICE</b>	Intercontinental Exchange
<b>IoT</b>	Internet of Things
<b>ITA</b>	Inland Terminal Association
<b>JECAM</b>	Joint Experiment for Crop Assessment and Monitoring
<b>JVWS</b>	Job Vacancy and Wage Survey
<b>LANTRA</b>	UK Sector Skills Council
<b>LCA</b>	Life Cycle Assessment
<b>LFS</b>	Labour Force Survey
<b>LMI</b>	Labour Market Information
<b>MISB</b>	Market and Industry Services Branch
<b>MIT</b>	Massachusetts Institute of Technology
<b>MPC</b>	Manitoba Pork Council
<b>MRL</b>	Maximum Residue Limit
<b>NACPS</b>	North American Product Classification System
<b>NASS</b>	National Agricultural Statistics Service
<b>NGO</b>	Non-Governmental Organization
<b>NOC</b>	National Occupation Classification
<b>NSO</b>	National Statistical Organization
<b>NZ</b>	New Zealand
<b>OMAFRA</b>	Ontario Ministry of Agriculture, Food, and Rural Affairs
<b>P&amp;SC</b>	Pulse and Special Crops
<b>PDQ</b>	Price and Data Quotes
<b>PGQ</b>	Les Producteurs de grains du Québec
<b>POGA</b>	Prairie Oat Growers Association
<b>QC RAIZO</b>	Réseau d'alerte et d'information zoonositaire
<b>REAP</b>	Regional Economic Analysis Program
<b>RFID</b>	Radio Frequency Identification
<b>S&amp;D</b>	Supply and Disposition
<b>SBDC</b>	Saskatchewan Barley Development Corporation
<b>SPG</b>	Saskatchewan Pulse Growers
<b>SRDI</b>	Système de recueil et de diffusion de l'informat
<b>SWAT</b>	Soil and Water Assessment Tool
<b>SWDC</b>	Saskatchewan Wheat Development Commission
<b>TFWP</b>	Temporary Foreign Worker Program
<b>UAV</b>	Unmanned Aerial Vehicles
<b>UK</b>	United Kingdom
<b>USDA</b>	United States Department of Agriculture
<b>USITC</b>	United States International Trade Commission
<b>WCSHIN</b>	Western Canada Swine Health Information Network

### 6.3 Inventory of Current Data Used

	Trade	Marketing	Transportation & Logistics	Sustainability	Traceability	Emerging	Other
<b>Aquaculture</b>	Statistics Canada CATSNET USITC	Statistics Canada		DFO BCSFA		Social License: CAIA	
<b>Bees</b>	Statistics Canada	Statistics Canada National Honey Board					
<b>Beef</b>	USDA Weekly Statistics Canada CFIA	CanFax Beef Farmers of Ontario Fédération des producteurs de bovins du Québec AAFC		Western Cow Calf Survey Beef Sustainability Survey Forage Survey FEMS COA	Beef Information Exchange System CFIA	AMR/AMU: CIPARS, CAHI, Public Health Agency of Canada	
<b>Bioproducts</b>	Statistics Canada	Statistics Canada  Industry survey of bio-product firms					
<b>Grains</b>	Statistics Canada Canadian Grain Commission Global Trade Atlas FAO	POGA Variety trials Seed Companies Buyers Processors Grain Companies AAFC Futures Markets (Ice, Chicago) PDQ Market Advisors Brokers Statistics Canada Agricorp Grain Farmers of Ontario PGQ USDA	GMP ATC USDA AAR CN CP	Census of Ag FEMS			
<b>Horticulture</b>	Statistics Canada	Statistics Canada AAFC					
<b>Labour</b>							Statistics Canada Horticulture Industry Survey

<b>Organics</b>	Statistics Canada	Statistics Canada COTA AE Neilson				Social License: Canada General Standards Board	
<b>Pork</b>	CFIA Statistics Canada AAFC Global Trade Atlas	Western Hog Exchange Hams Marketing Service Ontario Pork Statistics Canada CFIA USDA Provincial Governments Fédération des producteurs de porcs du Québec			PigTrace	Animal Health: CSHIN, WCSHIN, RAIZO, Swine Health Ontario  AMR/AMU: CIPARS	
<b>Pulse</b>	Bryant Christie Homogoga AAFC Statistics Canada USDA	Pulse Companies	Grain Monitoring Program Ag Transportation Coalition	Census of Agriculture FEMS Statistics Canada			
<b>Seafood</b>	Statistics Canada	DFO BC Government		Department of Fisheries and Oceans			
<b>Seed</b>	Statistics Canada	Seed Companies AAFC Statistics Canada Census of Ag Crop Insurance (CGC) CSTA CSGA				Social License: Census of Ag, Statistics Canada, CropLife Canada	
<b>Sheep</b>	Statistics Canada AAFC	AB Lamb Producers Ontario Sheep Statistics Canada AAFC			???	Social License: Food Safe Farm Practices	

## 6.4 FARMCo Canadian Data Sources & Issues

Area	Data Sources	Comments & Issues
<b>Stocks</b>	<ul style="list-style-type: none"> <li>Total Commercial Stocks: Canadian Grain Commission (weekly); Statistics Canada (March, July, December)</li> <li>Commercial Stocks by Location: Canadian Grain Commission (weekly)</li> <li>On Farm Stocks: Statistics Canada (March, July, December)</li> <li>All Stocks: Statistics Canada (March, July, December)</li> <li>Beginning Stocks: Statistics Canada (March, July, December); AAFC (January, June, September)</li> </ul>	<p>AAFC estimates are forecasts made prior to crop year, updates include Statistics Canada estimates</p> <p>Canadian Grain Commission data is reported by licensed grain handlers/dealers</p> <p>Statistics Canada data is from surveys</p> <p>Revisions to production will impact beginning stocks.</p>
<b>Production</b>	<ul style="list-style-type: none"> <li>Area Seeded: Statistics Canada (March, July, December); AAFC (January, June, September)</li> <li>Area Harvested: Statistics Canada (March, July, December); AAFC (January, June, September)</li> <li>Yield: Statistics Canada (March, July, December); AAFC (January, June, September)</li> <li>Production: Statistics Canada (March, July, December); AAFC (January, June, September)</li> </ul>	<p>AAFC estimates are forecasts made prior to crop year, updates include Statistics Canada estimates (collaboration)</p> <p>Canadian Grain Commission are reported by industry</p> <p>Revisions to production impact S&amp;D</p>
<b>Supply</b>	<ul style="list-style-type: none"> <li>Imports: Statistics Canada (March, July, December); AAFC (January, June, September)</li> <li>Total Supply: Statistics Canada (March, July, December); AAFC (January, June, September)</li> </ul>	<p>AAFC estimates of imports are forecasts made prior to crop year, updates include Statistics Canada estimates</p> <p>Statistics Canada estimates of imports are actual shipments reported through Canada Customs</p> <p>Inaccurate or untimely estimates of imports of competing crops like DDGs and corn can impact markets.</p>
<b>Movement</b>	<ul style="list-style-type: none"> <li>Farm Deliveries by Location: Canadian Grain Commission (annual)</li> <li>Farm Deliveries by Province: Canadian Grain Commission (weekly)</li> <li>Farm Deliveries to Processors: Canadian Grain Commission (weekly)</li> <li>Producer Car Loading: Canadian Grain Commission (weekly)</li> <li>Terminal Receipts: Canadian Grain Commission (weekly)</li> </ul>	
<b>Exports</b>	<ul style="list-style-type: none"> <li>Total Exports: Statistics Canada (March, July, December); AAFC (January, June, September)</li> <li>Exports by Product: Canadian Grain Commission (monthly); Statistics Canada (March, July, December)</li> <li>Exports of Western Canadian Grains: Canadian Grain Commission (weekly, monthly, annual); AAFC (January, June,</li> </ul>	<p>AAFC estimates are forecasts made prior to crop year, updates include Statistics Canada estimates</p> <p>Canadian Grain Commission data is reported by licensed grain handlers/dealers</p> <p>Statistics Canada estimates of exports are actual shipments reported through Canada Customs and Canadian Grain Commission data</p> <p>Exports reported by the Canadian Grain Commission and Statistics Canada do not agree and the differences are material</p>

	<p>September)</p> <ul style="list-style-type: none"> <li>• Exports of Eastern Canadian Grains: none</li> <li>• Exports by Port: Canadian Grain Commission (monthly, annual)</li> <li>• Exports by Grade: Canadian Grain Commission (weekly, monthly, annual)</li> <li>• Exports by Destination: Canadian Grain Commission (monthly, annual)</li> </ul>	<p>Canadian Grain Commission's exports to the US are from licenced grain dealers while Statistics Canada includes all exporters. There is a large delay in Statistics Canada reporting of the numbers.</p>
<b>Domestic Use:</b>	<ul style="list-style-type: none"> <li>• Commercial: Canadian Grain Commission (weekly)</li> <li>• Total Domestic Use: Statistics Canada (March, July, December); AAFC (January, June, September)</li> <li>• Human Food: Statistics Canada (March, July, December);</li> <li>• Industrial Use: Statistics Canada (March, July, December);</li> <li>• Human Food and Industrial Use: AAFC (January, June, September)</li> <li>• Seed Requirements: Statistics Canada (March, July, December);</li> <li>• Loss in Handling: Statistics Canada (March, July, December);</li> <li>• Animal Feed, Waste and Dockage: Statistics Canada (March, July, December)</li> <li>• Loss in Handling and Animal Feed, Waste and Dockage: AAFC (January, June, September)</li> </ul>	<p>AAFC estimates are forecasts made prior to crop year, updates include Statistics Canada estimates                  Statistics Canada surveys millers, feed mills and industrial processors                  Canadian Oilseed Processors Association: weekly report of canola and soybean processing                  Domestic use is often treated as a residual. In the feed market this is because of insufficient reporting by feed consumers.</p>
<b>Ending Stocks:</b>	<ul style="list-style-type: none"> <li>• Total Ending Stocks: Statistics Canada (March, July, December); AAFC (January, June, September)</li> <li>• Ending Stocks on Farms: Statistics Canada (March, July, December);</li> <li>• Ending Commercial Stocks: Canadian Grain Commission (weekly); Statistics Canada (March, July, December)</li> </ul>	<p>AAFC estimates are forecasts made prior to crop year, updates include Statistics Canada estimates                  Canadian Grain Commission data is reported by licensed grain handlers/dealers                  Statistics Canada's data is from surveys                  Revisions to production will impact beginning stocks.</p>

Source: FARMCo, "Crop Data and Price Reporting Project: Update for the Grain Value Chain Roundtable", November 2015

## 6.5 Inventory of Data Gaps

Table Key:

P: Producer

O: Other Supply Chain Participant

S: Sector

H: High

M: Medium

L: Low

	Trade	Marketing	Transportation & Logistics	Sustainability	Traceability	Emerging	Other
<b>Aquaculture</b>	<p>More HS codes, 8-digit HS codes</p> <p>Exports to US by province to state at 8-digit level (S-H)</p> <p>Interprovincial trade flows at 8-digit HS code level (S-H)</p>	Domestic utilization		DFO metrics		<p>Social license metrics</p> <p>AMR/AMU</p>	
<b>Bees</b>	<p>Market Access data like MRL's (S- M to L)</p> <p>Imports that are transhipped or adulterated product</p>	<p>Price of imported packaged bees and queens (P-H)</p> <p>Domestic utilization by kind of honey (P-M)</p> <p>Consumer demand trends (S-L)</p>					TFWP lists (P-H)
<b>Beef</b>	<p>Transhipments of Canadian beef through US</p> <p>Genetic trade data</p> <p>Maintaining robust export data and</p>	<p>Fed cattle prices: Limited values and volumes of cash market (P-H)</p> <p>Base formula, grid for fed cattle</p>		<p>Life cycle inventory information for crops, forage and cow-calf operations (S-H)</p> <p>COA: acres under conservation easements; manure</p>	Carcass information	<p>AMR for cow calf operations (S-M)</p> <p>Data on AMU (S-M)</p> <p>Antibiotic use in cow-calf operations and feedlots (S-M)</p>	Wage rates by ag position by province

	greater primal detail (S-M)	<p>Direct trade of feeder cattle</p> <p>Boxed beef contract information</p> <p>Producer prices for Atlantic Canada</p> <p>Formula/contract prices</p> <p>Retail prices by province</p> <p>Milk fed vs grain fed production</p> <p>Beef/veal production by month</p> <p>Interprovincial movements</p> <p>East West movements</p> <p>Organic beef production</p>		<p>nutrient management; winter cover crops, stockpiling</p> <p>FEMS: manure nutrient management; water quality</p> <p>Individual producer and feedlot sustainability</p> <p>Wildlife Habitat Index</p>		Surveillance data on animal health	
<b>Bioproducts</b>	<p>Biomass: Imports and exports of flax and hemp fibre by grade/quality</p> <p>Products like bio-composites not separate from conventional products</p>	<p>Biomass: No data on quality of biomass production (P, O, S – H)</p> <p>No data on location of biomass production</p> <p>Hemp production and quality of hemp fibre</p> <p>Missing NAPCS codes</p> <p>Distinct NAICS codes</p> <p>Registry of companies</p>		Information of volume of biomass per acres (defined as sustainability) (P, O, S – H)			

		<p>Benchmarking metrics</p> <p>Biodiesel: Prices for HDRH (green diesel)</p> <p>Price indices for ethanol and biodiesel</p>					
<b>Food Processing</b>	<p>Statistics include tobacco and alcohol which doesn't match all definitions of food processing sector</p> <p>Missing data on imports and exports of food manufacturing relative to total manufacturing</p>	<p>AAFC data includes tobacco and alcohol which doesn't match all definitions of food processing sector</p> <p>Inconsistent definition use can lead to misleading results</p> <p>Missing or difficult to access a complete set of economic and employment multipliers for food processing (S – H)</p> <p>Employment, facility numbers, and entry and exits by province is missing</p> <p>Contribution of food manufacturing to GDP relative to other manufacturers is missing or inaccessible</p> <p>Breakdown of AAFC spending that goes to food manufacturers versus producers by program, GF, and</p>					<p>Information about wages and salaries and more information on future demand for skills is missing</p>



		research is missing (S – H)					
<b>Grains</b>	<p>Inconsistent use of HS codes by countries for oats (S-H to M)</p> <p>Missing separate HS codes for human, feed, seed and other oats (S- H to M)</p> <p>Trade data at the provincial level for Atlantic Canada is needed (S – H)</p> <p>Wheat export data for Ontario is inaccurate (S – M)</p> <p>Need more specific HS codes for wheat (Ontario)</p> <p>Need weekly export and import data for QC corn (at least) (P – H)</p> <p>Missing canola exports to US (rail and truck) and canola exports by container</p> <p>Statistics Canada and CGC canola exports don't always reconcile (P, O, S – H)</p> <p>Timeliness of CGC canola export reports</p>	<p>Inaccurate seeding rates for oats (P – H)</p> <p>Allowed chemicals list for oats (P – H)</p> <p>Lack of user-friendly research reports for oats (P, S – H)</p> <p>Missing centralize list for approved varieties and chemicals for oats (P – L)</p> <p>Prices for oats – lack of transparency; no centralized site (P – H)</p> <p>Updated AAFC special report on oats (S – H)</p> <p>Data on oats for processing in Canada and the US (S – H)</p> <p>Data on oats for feed in Canada and the US (S – H)</p> <p>Price analysis for Atlantic Canada (P -H)</p> <p>Prices in Atlantic Canada – lack of transparency (like PDQ) (P – H)</p> <p>Transparency of corn prices sourced in ON and QC for Atlantic Canada</p>	<p>Better dissemination of GMP data on truck movement of oats to US (S – H)</p> <p>Missing information on flax movement to US (P, O, S – H)</p> <p>Uncertainty of funding for Ag Transport Coalition and MGP after 2017 (ITA) (O – H)</p> <p>Grain Monitoring Program (Pulse Can):</p> <p>Need Railway specific measures</p> <p>Order fulfillment data (not published, none for containers)</p> <p>Need shipper provided measure of demand</p> <p>No shipper specific data</p> <p>Loss of GMP data in 2017 (Pulse Canada) (P, O, S – H)</p> <p>QC would like freight rate for TB to Montreal (P – L)</p> <p>Can't reconcile GMP and Ag Transportation Coalition order fulfillment and commercial demand data for canola</p>	<p>Missing standard metrics for sustainability in flax (S – M)</p> <p>Agri Environmental Report was discontinued (CCGA) (P, O, S – H)</p> <p>Fertility management information missing (CCGA) (P, O, S – H)</p> <p>No easily accessible disaggregated information for energy use during production (CCGA) (P, O, S – H)</p> <p>No easily accessible water quality and ag impact data (CCGA) (P, O, S – H)</p>	<p>Missing ability to trace flax seed (S – M)</p>	<p>Need standardized data for social license (OGF) (S – M)</p>	<p>Regular market intelligence reports on oats by Canadian embassies (S – M to L)</p> <p>Information on organic market and production for flax (S – M)</p>

	<p>Timeliness of Statistics Canada canola reports</p> <p>No interprovincial trade information (SK M of Ag)</p> <p>No HS codes for organic grains (SK M of Ag)</p> <p>Global Trade Atlas data missing codes for small commodities and some small countries don't report (SK M of Ag) (S)</p> <p>CGC estimates it is missing about 20% of exports (containerized)</p>	<p>Lack of prices by geography on line in MB (P – M to L)</p> <p>Lack of accurate crop size forecasts in MB (P, O, S – H)</p> <p>Lack of transparency in flax prices (P – H)</p> <p>Inaccurate or out of date information on provincial flax price</p> <p>Inaccurate crop production forecast for flax ((P, O, S -H)</p> <p>Precise domestic flax utilization data for US and Canada (S – M)</p> <p>Missing data for flax used in manufacturing or processing (S – M)</p> <p>Field crop estimates not timely (ITA) (P - H)</p> <p>S&amp;D data not accurate or timely (ITA) (P – M)</p> <p>Lack of price transparency (ITA) (P – L)</p> <p>Production, yield, and acreage data for Ontario corn, wheat and soybeans inaccurate, not timely, and incomplete (S – H)</p>	<p>Uncertainty of funding for GMP and AGT after 2017 (CCGA)</p> <p>Uncertainty of CTA review data recommendations (CCGA)</p> <p>GMP: reporting from CP on grain car allocation is not available because of a change in allocation system (SK M of Ag) (S)</p> <p>GMP: no data on free on board or track prices, vessel line up and export pace (SK M of Ag) (S)</p> <p>GMP: truck crossing at boarder and outward inspection volumes (SK M of Ag) (S)</p> <p>Ag Transportation Coalition: no data on FOB and track prices at port, vessel lineup, export pace, and terminal capacity (SK M of Ag) (S)</p> <p>No information on vessel line ups (CGC)</p> <p>CP is not providing data in sufficient detail for order fulfillment metrics (GMP)</p> <p>Weekly reporting of grain sales (GMP)</p>				
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		<p>Need S&amp;D with domestic end-use utilization for Ontario wheat, corn, and soybeans (S – H)</p> <p>Need more transparent input prices in QC (P – H)</p> <p>QC needs data on ethanol production in Canada/East/West (P – M)</p> <p>Need accurate, up to date information on crop in QC (P – H)</p> <p>Need information on smaller crops in QC such as organics (P - M)</p> <p>More price transparency for canola (P – H)</p> <p>Need more transparency and detail in AAFC's weekly price summary for canola</p> <p>ICE port price for canola could be inaccurate</p> <p>Port transaction prices for canola are missing (but would violate confidentiality)</p> <p>Statistics Canada's estimate of canola</p>	<p>Port track prices (GMP)</p> <p>Port vessel data (GMP)</p> <p>Benchmarking of certain performance metrics in other countries (GMP)</p>				
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		<p>production are inaccurate, volatile and not timely (P, O, S – H)</p> <p>Basis pricing masked as not reported in CDN \$ (SK M of Ag) (P, O, S)</p> <p>Port pricing only available from AAFC with a 1-week delay and difficult to find (SK M of Ag) (P, O, S)</p> <p>Comprehensive input pricing information is not available (SK M of Ag) (P, O, S)</p> <p>S&amp;D information is not precise or timely because reporting is not mandatory (SK M of Ag) (O - S)</p> <p>Grain Statistics Weekly used to have information from CWB on inland grain prices and cost of moving wheat from a central point to port (CGC)</p> <p>CWB variety survey replaced by crop insurance data (CGC)</p> <p>CGC receive poor data from grain dealers</p> <p>CGC does not have information on eastern Canada</p>					
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		(regulatory related)					
<b>Horticulture</b>	<p>More detailed HS codes (P, O, S – H)</p> <p>Retention of HS codes (P, O, S – H)</p>	<p>Production data for world corps like snow peas</p> <p>Value of potatoes</p> <p>Apple production by variety</p> <p>Horticulture data for some provinces</p> <p>Organic statistics (P, O, S – H)</p> <p>Wholesale data: slight delay and missing locations (P, O, S – H)</p> <p>Organic prices (Toronto)</p> <p>Prices for niche products</p> <p>FOB prices for carrots, onions, and potatoes (P, O, S – H)</p> <p>Storage data</p> <p>SK and NS potato data</p> <p>NB apple data</p>					
<b>Labour</b>							<p>Statistics Canada Vacancy Survey: Only 2 quarters so far</p> <p>Data missing because of confidentiality and</p>

							<p>too few observations</p> <p>Information by more detailed NAICS and NOC codes are gathered but not published (have to ask)</p> <p>General: No commodity specific wage data (except for horticulture) (need methodology and process) (P, O, S – H)</p> <p>S&amp;D of labour for primary ag, primary processing and agribusiness</p> <p>NOC codes for agriculture misclassified (P, O, S – H)</p> <p>Supply and demand and wages on a daily basis</p> <p>Training needs, gaps,</p> <p>TFWP: data not updated</p> <p>Statistics Canada: Labour Force Survey:</p> <p>Lack of detail</p> <p>No data for aquaculture</p>
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							<p>Has more detailed data by NAICS code but not published (must ask for it)</p> <p>Inaccurate count of temporary foreign workers</p> <p>Statistics Canada: Annual Greenhouse, Sod and Nursery Survey: Some provinces lack data</p>
<b>Organics</b>	HS codes for organic imports and exports (P, O, S – M)	<p>COTA: missing, incomplete production and acreage data (P, O, S – H)</p> <p>Statistics Canada: No production or acreage by commodity</p> <p>Price data (P, O, S – M)</p> <p>Consumer sales data from health food stores and restaurants</p> <p>Production of organic dairy products (AAFC)</p> <p>Production and prices of organic chicken and turkey (AAFC)</p>	Movement of organic products	Sustainability data on carbon sequestration and biodiversity			<p>Standardized information on consumers</p> <p>Organic seed production</p>
<b>Pork</b>	Exports: CFIA categories and HS codes misaligned (S – H)	Sow price information (P – M)	Trucking costs			CIPARS: Regional data (not representative) (S – H)	WCSHIN not used outside of Western Canada

	<p>Use of incorrect HS code</p> <p>Proposed decrease in codes (S - H)</p> <p>NES category for imports and exports by cut (S - H)</p>	<p>Feeder/weaner prices (P - M)</p> <p>Price of pre-mix/prepared feed</p> <p>Average monthly feeder prices outside of QC and ON</p> <p>Pork production by month by province</p> <p>% of slaughter going to further processing</p> <p>Canada price of hogs</p> <p>Sales by commodity code for pork</p> <p>Partial condemnations</p>				<p>Time lag in release (2 years)</p> <p>AMR and AMU data for sow barns and nurseries (S - H)</p>	
<b>Pulse</b>	<p>Access to MRL tools for international markets (P - H)</p> <p>Missing import requirements outside of high profile markets</p> <p>Access to tariff information</p> <p>Non-compliance notices by importers</p> <p>Domestic and North American utilization (S - H)</p>	<p>Compilation of prices</p> <p>MRL in importing country or Canada</p> <p>Compilation of harvest aid advisories</p>	<p>Grain Monitoring Program:</p> <p>Railway specific measures</p> <p>Order fulfillment data (not published, none for containers)</p> <p>Shipper provided measure of demand</p> <p>No shipper specific data</p> <p>Loss of GMP data in 2017 (P, O, S - H)</p>	<p>Agri-Environmental report series</p> <p>COA and FEMS: fertility management</p> <p>Energy used during production</p> <p>Water quality</p> <p>Biodiversity</p>			
<b>Seafood</b>	<p>Proposed decrease in codes (O, S - H)</p> <p>NES category too</p>	<p>Missing price for wild fish (P, O, S - H)</p> <p>Missing information</p>		<p>DFO data on capture and production (P, O, S - H)</p>			



	large (O, S – H)	<p>on domestic consumption (P, O, S - H)</p> <p>DFO data on capture, and production (P, O, S – H)</p> <p>Value information (S - M)</p> <p>Limited Economic analysis (S - M)</p>					
<b>Seed</b>		<p>CWB variety survey (crop insurance data not as good) (P, O, S – H)</p> <p>Acreage data for small regions for all provinces (P, O, S – M to L)</p> <p>R&amp;D data (private sector infrequent, public sector missing) (for public sector: S – H)</p> <p>Sector employment (S – M)</p> <p>Certified organic seed</p> <p>Pedigreed seed sales in horticulture</p> <p>Domestic seed sales</p> <p>Share of acres using certified seed (S – H)</p>		<p>Tillage information (S – M)</p> <p>Energy savings because of new seed technologies</p>			
<b>Sheep</b>	<p>Imports and exports by cut</p> <p>Imports and exports of feeder vs</p>	<p>Production data (inaccuracies)</p> <p>Cost of production (P – H)</p>			<p>Premise ID for all provinces</p> <p>Movement reporting</p>	<p>On farm food safety program (paper based, no aggregate data)</p>	

	slaughter lambs  Imports and exports of sheep for breeding  Genetic exports (S – M)	FIPI for sheep  Stockyard volume and price (P – H)  Price information from processor (P – H)  Genetic data for flock improvement  Lamb crop information (P, O, S – H)  Retail prices by province  Wholesale prices outside of Montreal (S – M)  Value and volume of primal cuts (S – M)  Cold storage inventory (P, O, S – H)  Interprovincial movement (P, O, S – H)  Weekly carcass data (O – H) (S – M)  Condemnations (S – M)  Aggregate production information  Slaughter by province			Movement tracking (P, O, S – H)  Manifest information  Ability to use CSIP tag info	Animal care assessment framework  AMR/AMU (no CIPARS)  Own use imported veterinary drugs	
<b>Special Crops (assumed that all</b>	US hemp fibre export data by state	Herb and spice supply and disposition (P, O,					

<p><b>of these were high at the producer, supply chain participant and sector level)</b></p>	<p>(P, O, S – H)</p> <p>International trade data for buckwheat (P, O, S – H)</p> <p>Herb and spice import and export data for all herbs and spices (P, O, S – H)</p>	<p>S – H)</p> <p>Hemp production data (P, O, S – H)</p>					
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## 6.6 Inventory of Data Gap Impacts

### Trade

Impact	Type of Data Gap	Sectors Impacted
<b>Impacts business decisions</b>	Lack of province specific data; lack of detail in HS codes; data open to misinterpretation; decrease in HS codes	Sheep; Grain (Atlantic, CCGA); Seafood
<b>Market monitoring/sales planning is more difficult</b>	Lack of province specific data; lack of detail in HS codes; inaccurate export numbers; lack of frequency in export and import reporting; CGC and Statistics Canada data don't reconcile	Aqua; Sheep; Grain (CCGA, QC, GFO)
<b>Program evaluation more difficult; impacts investment in export markets; impacts market development planning/strategies</b>	Lack of detail in HS codes; lack of HS codes; HS codes don't match US codes; codes used incorrectly; missing/inaccurate/partial data; no data on transhipped or adulterated products; no data on transshipments through US; lack of accuracy in North American utilization; decrease in HS codes	Aqua; Sheep; Organics; Pulse; Beef; Bees; Pork; Grain (Oats; GFO); Seafood
<b>Result in market access issues</b>	Difficulty in accessing MRL, tariff, and import requirement information and non-compliance notices	Bees; Pulse
<b>Impact of trade agreements can't be monitored/measured</b>	Decrease in HS codes, lack of detail in HS codes; lack of province specific data; incorrect HS code use	Pork; Grain (Atlantic, Oats)
<b>Lack of information for government programs</b>	Lack of HS codes; missing transshipment data through US	Organics
<b>Lack of information to deal with trade disputes</b>	Lack of detailed HS codes	Horticulture
<b>Makes government relations more difficult</b>	Lack of sector trade comparisons; differences in sector definition	Food Processing
<b>Makes commercial transactions more difficult</b>	Lack of data by quality	Bioproducts
<b>Makes it difficult to stop fraudulent trade</b>	Lack of detailed HS codes	Aqua
<b>Impacts S&amp;D</b>	Inaccurate provincial exports; lack of weekly trade by province	Grain (QC, GFO)

### Marketing

Impact	Type of Data Gap	Sectors Impacted
<b>Inability to benchmark operations/make comparisons</b>	Lack of comparable COP for sheep; missing contract price information for boxed beef; lack of bio product metrics for international comparisons; crop insurance variety data not always comparable across provinces; estimates of domestic pedigreed seed sales can be inaccurate; lack of comparable input price information	Sheep; Beef; Bio Products; Seed; Grain (SK Ag)
<b>Impacts productivity</b>	No FIPI for sheep; lack of genetic program information for sheep; inconsistent seeding rates for oats; lack of user friendly research reports for oats	Sheep; Grain (Oats)
<b>Creates market uncertainty/volatility</b>	Lack of timely information on lamb crop; Statistics Canada production forecasts are inaccurate, volatile and untimely; lack of timeliness in QC production forecasts	Sheep; Grain (CCGA, QC)
<b>Impacts profitability</b>	Lack of timely information on lamb crop; missing retail and whole price information in sheep; lack of genetic program information for sheep; missing cold storage inventory for sheep; no FIPI for sheep; missing sheep stockyard report on value and volume; interprovincial movement for sheep is accurate; Prices of packaged bees and queens difficult to interpret and track; missing published feeder/weaner and pre-mixed and prepared feed in pork; crop insurance variety survey less accurate than CWB survey for seed sector; infrequent acreage data for small regions for seed; missing S&D information for organics; missing wholesale horticulture prices at some locations; inaccurate organic horticulture product prices in Toronto; missing prices for niche horticulture products and FOB prices for onions, carrots, and potatoes; missing price data for ethanol and biodiesel; difficult to access green diesel price information; lack of access to transparent information on canola cash bids and basis; lack of transparency in AFFC's weekly summary of port prices; port price for canola could be inaccurate; pulse crop price information not transparent; flax price not transparent; lack of detailed data and price analysis for Atlantic Canada and transparency in prices of corn sourced in ON and QC; missing input prices in QC; missing production estimates of ethanol in QC; lack of transparency in oat prices; inconsistent seeding rates for oats; lack of user friendly research reports for oats; ; lack of robust DFO data impacts sales	Sheep; Bees; Pork; Seed; Organics; Horticulture; Bio Products; Pulse; Grain (CCGA, Oats, Atlantic Grains Council, Flax); Seafood

<b>Impacts production/marketing decisions/ improvement initiatives</b>	Lack of timely information on lamb crop; missing weekly carcass data for sheep; incomplete condemnation data for sheep; sow price information not transparent; estimates of domestic pedigreed seed sales can be inaccurate; hemp acreage, yield and production not easily accessible; lack of information on newer horticulture products, production of apples by variety; incomplete data by province; missing data on organic horticulture; inaccurate storage data in horticulture; missing SK and NS potato and NB apple data; pulse prices not transparent; lack of port pricing information decreases producer confidence that price reflect global situation; inaccurate flax crop estimate; lack of information on small crops like organics in QC; Statistics Canada crop reports are not timely (ITA); S&D for special crops are not accurate or timely (ITA); price are not transparent and port prices may be inaccurate (ITA); lack of transparency in oat prices; Lack of wild fish price information	Sheep; Pork; Seed; Horticulture; Bio Products; Pulse; Grains (Flax, QC; ITA; Oats); Seafood
<b>Impacts view of market</b>	missing retail and whole price information in sheep; missing cold storage inventory for sheep; missing primal cut value and volume for sheep; missing weekly carcass data for sheep; interprovincial movement for sheep is accurate; no NAPCS codes for bioproducts means can't track along supply chain	Sheep; Bio Products
<b>Impacts industry stability and growth</b>	Lack of timely information on lamb crop; interprovincial movement for sheep is accurate; Lack of information on biomass location; lack of information/transparency on organic flax production and price; lack of information on smaller crops in QC like organics	Sheep; Bio Products; Grains (Flax, QC)
<b>Impacts planning</b>	Lack of timely information on lamb crop; missing AAFC sheep industry profile; infrequent acreage data for small regions (seed); lack of S&D by organic commodity; basis not always in CAD; lack of information on utilization of oats for feed and processing in Canada and the US; lack of timely, accessible and accurate value of wild fish industry;	Sheep; Seed; Organics; SK AG, Oats; Seafood
<b>Distribution of market power</b>	Missing contract price information for boxed beef; basis information not always in CAD	Beef; SK Ag
<b>Impacts government programs</b>	Quality of cash price reported in beef; missing or inaccurate information	Beef; SK Ag
<b>Market development</b>	Domestic market information missing for honey; lack of detail on consumption of different types of honey; bio product company registry will go out of date; lack of information on organic certified seed; infrequent information on organic sector from CoA; consumer sales data for organic products is incomplete; lack of information on world horticulture crops; missing domestic aquaculture sales; lack of accurate information on utilization of flax in Canada and the US; Statistics Canada production, yield, and acreage for Ontario not accurate or complete; domestic/end use utilization not tailored to ON; lack of information on domestic wild fish consumption; lack of economic analysis on wild fish sector	Bees; Bio Products; Seed; Organic; Horticulture; Aqua; Grains (Flax, GFO); Seafood
<b>TFWP</b>	List is missing (bees)	Bees
<b>Impacts government relations</b>	Lack of plant breeding R&D data for public sector and employment data in seed sector; differences in sector definition for food processing; incomplete multiplier information for food processing; data on food processing facilities, entry and exits, and employment are missing or difficult to access; lack of robust DFO; lack of timely, accessible and accurate value of wild fish industry; lack of economic analysis on wild fish sector	Seed; Food Processing; Seafood
<b>Impacts market efficiency</b>	Lack of organic price information; S&D information is imprecise	Organic; SK Ag
<b>Impacts availability of financing</b>	Lack of wild fish price information	Seafood
<b>Impacts certification</b>	lack of robust DFO data	Seafood

## Transportation and Logistics

Impact	Type of Data Gap	Sectors Impacted
<b>Impacts sale planning/logistics planning</b>	Pulse: in GMP no railway specific measures; order fulfillment data not published; nor shipper provided measure of demand; SK Ag: no information on CP car allocation; SK Ag – Both GMP and ATC are missing FOB and track price at port, vessel line up; export pace; GMP and ATC missing information on oat and flax movement to US	Pulse, SK Ag
<b>Impacts business decisions</b>	No specific data for organics; SK Ag – Both GMP and ATC are missing FOB and track price at port, vessel line up; export pace	Organics; SK Ag
<b>Impacts level of competition</b>	SK Ag – Both GMP and ATC are missing FOB and track price at port, vessel line up; export pace;	Sk Ag
<b>Impacts view of market</b>	Difficult to get freight rate from TB to Mtl; can't reconcile GMP and ATC order fulfillment data (canola)	QC, Canola

### Sustainability

Impact	Type of Data Gap	Sectors Impacted
<b>Impacts planning</b>	Lack of timely tillage information from Statistics Canada	Seed
<b>Impacts the development of metrics</b>	Lack of good information on biomass availability; loss of Agri-Environmental Report; incompleteness of set of indicators developed by DFO; missing fertility information; difficulty in accessing energy use data; lack of water quality data; and agriculture's impact on water data is difficult to use and access; biodiversity/habitat data is difficult to use and access; lack of data on inputs used by individual crops; missing information in CoA and FEMS; lack of robust wild life habitat index	Seed; Beef; Pulse; Organic; Bioproducts; Aquaculture; Grain (Flax, Canola)
<b>Metric confusion and cost</b>	Lack of standardized metrics	Grain (Flax)
<b>Impacts certification (difficulty and cost)</b>	lack of robust DFO data	Seafood

### Traceability

Impact	Type of Data Gap	Sectors Impacted
<b>Impacts system performance</b>	Lack of movement data for most provinces; inability to geo-locate co-mingling sites	Sheep
<b>Reduces information flow</b>	Paper based manifest data; inconsistent use of CSIP tag number; missing carcass information as packers reluctant to provide data free of charge	Sheep, Beef
<b>Increases consequences of an issue</b>	Lack of traceability system	Grain (Flax)

### Emerging Issues

Impact	Type of Data Gap	Sectors Impacted
<b>Risks to human and animal health elevated</b>	AMR/AMU tracking does not occur in sheep and aquaculture sectors; gaps in tracking in pork and	Sheep; Aquaculture; Beef;

	beef sectors	Pork
Inability to answer questions regarding social license/public confidence	Incomplete information on AMR/AMU	Beef

**Labour**

Impact	Type of Data Gap	Sectors Impacted
Productivity losses through TFWP	Job Vacancy and Wage Survey is very recent and is not very transparent; lack of commodity specific wage rate information; misclassification of NOC codes for agriculture; inaccurate count of temporary foreign workers by the Labour Force Survey; out of date wage rate data	All
Impacts business decisions/planning	Job Vacancy and Wage Survey is historic, not current and is not very transparent (sectors not aware of the existence of more detailed data); lack of transparency in the Labour Force Survey (sectors not aware of the existence of more detailed data); lack of data on the supply and demand for labor by primary agriculture, primary processing, and agribusiness	All
Poor program design and administration	The data gaps identified above	All

### 6.7 Inventory of Industry Priorities

Sector	Area	Producer	Other Supply Chain Participant	Sector
<b>Aquaculture</b>	Trade			High: <ul style="list-style-type: none"> <li>Exports to US by province to state at 8-digit level</li> <li>Interprovincial trade flows at 8-digit HS code level</li> </ul>
<b>Bees</b>	Trade			Medium to Low: <ul style="list-style-type: none"> <li>Market Access data like MRL's</li> </ul>
	Marketing	High: <ul style="list-style-type: none"> <li>Price of imported packaged bees and queens</li> </ul> Medium: <ul style="list-style-type: none"> <li>Domestic utilization by kind of honey</li> </ul>		Low: <ul style="list-style-type: none"> <li>Consumer demand trends</li> </ul>
	Labour	High: <ul style="list-style-type: none"> <li>TFWP lists</li> </ul>		
<b>Beef</b>	Trade			Medium: <ul style="list-style-type: none"> <li>Maintaining robust export data and greater primal detail</li> </ul>
	Marketing	High: <ul style="list-style-type: none"> <li>Fed cattle prices: Limited volumes in cash market</li> </ul>		
	Sustainability			High: <ul style="list-style-type: none"> <li>Life cycle inventory information for crops, forage and cow-calf operations</li> </ul>
	Emerging			Medium: <ul style="list-style-type: none"> <li>AMR for cow calf operations</li> <li>Data on AMU</li> <li>Antibiotic use in cow-calf operations and feedlots</li> </ul>
<b>Bioproducts</b>	Marketing	High: <ul style="list-style-type: none"> <li>Biomass: No data on quality of biomass production</li> </ul>	High: <ul style="list-style-type: none"> <li>Biomass: No data on quality of biomass production</li> </ul>	High: <ul style="list-style-type: none"> <li>Biomass: No data on quality of biomass production</li> </ul>
	Sustainability	High: <ul style="list-style-type: none"> <li>Information of volume of biomass per acres</li> </ul>	High: <ul style="list-style-type: none"> <li>Information of volume of biomass per acres</li> </ul>	High: <ul style="list-style-type: none"> <li>Information of volume of biomass per acres</li> </ul>
<b>Food Processing</b>	Marketing			High: <ul style="list-style-type: none"> <li>Complete set of multipliers</li> <li>Breakdown of AAFC funding to food processors relative to producers by program and research</li> </ul>



<b>Horticulture</b>	Trade	High: <ul style="list-style-type: none"> <li>• More detailed HS codes</li> </ul>	High: <ul style="list-style-type: none"> <li>• More detailed HS codes</li> </ul>	High: <ul style="list-style-type: none"> <li>• More detailed HS codes</li> </ul>
	Marketing	High: <ul style="list-style-type: none"> <li>• Organic statistics</li> <li>• FOB prices for carrots, onions, and potatoes</li> </ul>	High: <ul style="list-style-type: none"> <li>• Organic statistics</li> <li>• FOB prices for carrots, onions, and potatoes</li> </ul>	High: <ul style="list-style-type: none"> <li>• Organic statistics</li> <li>• FOB prices for carrots, onions, and potatoes</li> </ul>
<b>Labour</b>	(Note, CAHRC wants industry to set priorities)	High: <ul style="list-style-type: none"> <li>• No commodity specific wage data (except for horticulture) (need methodology and process)</li> <li>• NOC codes for agriculture misclassified</li> </ul>	High: <ul style="list-style-type: none"> <li>• No commodity specific wage data (except for horticulture) (need methodology and process)</li> <li>• NOC codes for agriculture misclassified</li> </ul>	High: <ul style="list-style-type: none"> <li>• No commodity specific wage data (except for horticulture) (need methodology and process)</li> <li>• NOC codes for agriculture misclassified</li> </ul>
<b>Organics</b>	Trade	Medium: <ul style="list-style-type: none"> <li>• HS codes for organic imports and exports</li> </ul>	Medium: <ul style="list-style-type: none"> <li>• HS codes for organic imports and exports</li> </ul>	Medium: <ul style="list-style-type: none"> <li>• HS codes for organic imports and exports</li> </ul>
	Marketing	High: <ul style="list-style-type: none"> <li>• COTA: missing, incomplete production and acreage data</li> </ul> Medium: <ul style="list-style-type: none"> <li>• Price data</li> </ul>	High: <ul style="list-style-type: none"> <li>• COTA: missing, incomplete production and acreage data</li> </ul> Medium: <ul style="list-style-type: none"> <li>• Price data</li> </ul>	High: <ul style="list-style-type: none"> <li>• COTA: missing, incomplete production and acreage data</li> </ul> Medium: <ul style="list-style-type: none"> <li>• Price data</li> </ul>
<b>Pork</b>	Trade			High: <ul style="list-style-type: none"> <li>• Exports: CFIA categories and HS codes misaligned</li> <li>• Proposed decrease in codes</li> <li>• NES category for imports and exports by cut</li> </ul>
	Marketing	Medium: <ul style="list-style-type: none"> <li>• Sow price information</li> <li>• Feeder/weaner prices</li> </ul>		
	Emerging			High: <ul style="list-style-type: none"> <li>• CIPARS: Regional data (not representative)</li> <li>• AMR and AMU data for sow barns and nurseries</li> </ul>
<b>Pulse</b>	Trade	High: <ul style="list-style-type: none"> <li>• Access to MRL tools for international markets</li> </ul>		High: <ul style="list-style-type: none"> <li>• Domestic and North American utilization</li> </ul>
	Transportation & Logistics	High: <ul style="list-style-type: none"> <li>• Loss of GMP data in 2017</li> </ul>	High: <ul style="list-style-type: none"> <li>• Loss of GMP data in 2017</li> </ul>	High: <ul style="list-style-type: none"> <li>• Loss of GMP data in 2017</li> </ul>
<b>Seafood</b>	Trade		High: <ul style="list-style-type: none"> <li>• Proposed decrease in codes</li> <li>• NES category too large</li> </ul>	High: <ul style="list-style-type: none"> <li>• Proposed decrease in codes</li> <li>• NES category too large</li> </ul>
	Marketing	High: <ul style="list-style-type: none"> <li>• Missing price for wild fish</li> <li>• Missing information on domestic consumption</li> <li>• DFO data on capture and production</li> </ul>	High: <ul style="list-style-type: none"> <li>• Missing price for wild fish</li> <li>• Missing information on domestic consumption</li> <li>• DFO data on capture and production</li> </ul>	High: <ul style="list-style-type: none"> <li>• Missing price for wild fish</li> <li>• Missing information on domestic consumption</li> <li>• DFO data on capture and production</li> </ul>

				<p>Medium:</p> <ul style="list-style-type: none"> <li>Value information</li> <li>Limited Economic analysis</li> </ul>
	Sustainability	<p>High:</p> <ul style="list-style-type: none"> <li>DFO data on capture and production</li> </ul>	<p>High:</p> <ul style="list-style-type: none"> <li>DFO data on capture and production</li> </ul>	<p>High:</p> <ul style="list-style-type: none"> <li>DFO data on capture and production</li> </ul>
<b>Seed</b>	Marketing	<p>High:</p> <ul style="list-style-type: none"> <li>CWB variety survey</li> </ul> <p>Medium to Low:</p> <ul style="list-style-type: none"> <li>Acreage data for small regions for all provinces</li> </ul>	<p>High:</p> <ul style="list-style-type: none"> <li>CWB variety survey</li> </ul> <p>Medium to Low:</p> <ul style="list-style-type: none"> <li>Acreage data for small regions for all provinces</li> </ul>	<p>High:</p> <ul style="list-style-type: none"> <li>CWB variety survey</li> <li>R&amp;D data (private sector infrequent, public sector missing) (for public sector H)</li> <li>Share of acres using certified seed</li> </ul> <p>Medium:</p> <ul style="list-style-type: none"> <li>Sector employment</li> </ul> <p>Medium to Low:</p> <ul style="list-style-type: none"> <li>Acreage data for small regions for all provinces</li> </ul>
	Sustainability			<p>Medium:</p> <ul style="list-style-type: none"> <li>Tillage information</li> </ul>
<b>Sheep</b>	Trade			<p>Medium:</p> <ul style="list-style-type: none"> <li>Genetic exports</li> </ul>
	Marketing	<p>High:</p> <ul style="list-style-type: none"> <li>Cost of production</li> <li>Stockyard volume and price</li> <li>Price information from processor</li> <li>Lamb crop information</li> <li>Cold storage inventory</li> <li>Interprovincial movement</li> </ul>	<p>High:</p> <ul style="list-style-type: none"> <li>Lamb crop information</li> <li>Cold storage inventory</li> <li>Interprovincial movement</li> <li>Weekly carcass data</li> </ul>	<p>High:</p> <ul style="list-style-type: none"> <li>Lamb crop information</li> <li>Cold storage inventory</li> <li>Interprovincial movement</li> </ul> <p>Medium:</p> <ul style="list-style-type: none"> <li>Wholesale prices outside of Montreal</li> <li>Value and volume of primal cuts</li> <li>Weekly carcass data</li> <li>Condemnations</li> </ul>
	Traceability	<p>High:</p> <ul style="list-style-type: none"> <li>Movement tracking</li> </ul>	<p>High:</p> <ul style="list-style-type: none"> <li>Movement tracking</li> </ul>	<p>High:</p> <ul style="list-style-type: none"> <li>Movement tracking</li> </ul>
<b>Special Crops</b>	Trade	<p>High:</p> <ul style="list-style-type: none"> <li>US hemp fibre export data by state</li> </ul>	<p>High:</p> <ul style="list-style-type: none"> <li>US hemp fibre export data by state</li> </ul>	<p>High:</p> <ul style="list-style-type: none"> <li>US hemp fibre export data by state</li> </ul>
	Marketing	<p>High:</p> <ul style="list-style-type: none"> <li>Herb and spice supply and disposition</li> </ul>	<p>High:</p> <ul style="list-style-type: none"> <li>Herb and spice supply and disposition</li> </ul>	<p>High:</p> <ul style="list-style-type: none"> <li>Herb and spice supply and disposition</li> </ul>

Sector	Area	Producer	Other Supply Chain Participant	Sector
Grains	Trade	<p>High:</p> <ul style="list-style-type: none"> <li>Need weekly export and import data for QC corn (at least)</li> <li>Statistics Canada and CGC canola exports don't always reconcile</li> </ul>	<p>High:</p> <ul style="list-style-type: none"> <li>Statistics Canada and CGC canola exports don't always reconcile</li> </ul>	<p>High:</p> <ul style="list-style-type: none"> <li>Trade data at the provincial level for Atlantic Canada is needed</li> <li>Statistics Canada and CGC canola exports don't always reconcile</li> </ul> <p>Medium:</p> <ul style="list-style-type: none"> <li>Inconsistent use of HS codes by countries for oats</li> <li>Missing separate HS codes for human, feed, seed and other oats</li> <li>Wheat export data for Ontario is inaccurate</li> </ul>
	Marketing	<p>High:</p> <ul style="list-style-type: none"> <li>Inaccurate seeding rates for oats</li> <li>Allowed chemicals list for oats</li> <li>Lack of user-friendly research reports for oats</li> <li>Prices for oats – lack of transparency; no centralized site</li> <li>Price analysis for Atlantic Canada</li> <li>Prices in Atlantic Canada – lack of transparency (like PDQ)</li> <li>Lack of accurate crop size forecasts in MB</li> <li>Lack of transparency in flax prices</li> <li>Inaccurate crop production forecast for flax</li> <li>Field crop estimates not timely (ITA)</li> <li>Need more transparent input prices in QC</li> <li>Need accurate, up to date information on crop in QC</li> <li>More price transparency for canola</li> <li>Statistics Canada's estimate of canola production are inaccurate, volatile and not timely</li> </ul> <p>Medium:</p> <ul style="list-style-type: none"> <li>S&amp;D data not accurate or timely (ITA)</li> <li>QC needs data on ethanol production in Canada/East/West</li> <li>Need information on smaller crops in QC such as organics</li> </ul> <p>Medium to Low:</p> <ul style="list-style-type: none"> <li>Lack of prices by geography on line in MB</li> </ul>	<p>High:</p> <ul style="list-style-type: none"> <li>Lack of accurate crop size forecasts in MB</li> <li>Inaccurate crop production forecast for flax</li> <li>Statistics Canada's estimate of canola production are inaccurate, volatile and not timely</li> </ul>	<p>High:</p> <ul style="list-style-type: none"> <li>Updated AAFC special report on oats</li> <li>Data on oats for processing in Canada and the US</li> <li>Data on oats for feed in Canada and the US</li> <li>Lack of accurate crop size forecasts in MB</li> <li>Inaccurate crop production forecast for flax</li> <li>Production, yield, and acreage data for Ontario corn, wheat and soybeans inaccurate, not timely, and incomplete</li> <li>Need S&amp;D with domestic end-use utilization for Ontario wheat, corn, and soybeans</li> <li>Statistics Canada's estimate of canola production are inaccurate, volatile and not timely</li> </ul> <p>Medium:</p> <ul style="list-style-type: none"> <li>Precise domestic flax utilization data for US and Canada</li> <li>Missing data for flax used in manufacturing or processing</li> </ul>

		<p>Low:</p> <ul style="list-style-type: none"> <li>• Missing centralized list for approved varieties and chemicals for oats</li> <li>• Lack of price transparency (ITA)</li> </ul>		
	Transportation & Logistics	<p>High:</p> <ul style="list-style-type: none"> <li>• Better dissemination of GMP data on truck movement of oats to US</li> <li>• Missing information on flax movement to US</li> <li>• Loss of GMP data in 2017 (Pulse Canada)</li> </ul> <p>Low:</p> <ul style="list-style-type: none"> <li>• QC would like freight rate for TB to Montreal</li> </ul>	<p>High:</p> <ul style="list-style-type: none"> <li>• Missing information on flax movement to US</li> <li>• Uncertainty of funding for Ag Transport Coalition and MGP after 2017 (ITA)</li> <li>• Loss of GMP data in 2017 (Pulse Canada)</li> </ul>	<p>High:</p> <ul style="list-style-type: none"> <li>• Missing information on flax movement to US</li> <li>• Loss of GMP data in 2017 (Pulse Canada)</li> </ul>
	Sustainability	<p>High:</p> <ul style="list-style-type: none"> <li>• Agri Environmental Report was discontinued (CCGA)</li> <li>• Fertility management information missing (CCGA)</li> <li>• No easily accessible disaggregated information for energy use during production (CCGA)</li> <li>• No easily accessible water quality and ag impact data (CCGA)</li> </ul>	<p>High:</p> <ul style="list-style-type: none"> <li>• Agri Environmental Report was discontinued (CCGA)</li> <li>• Fertility management information missing (CCGA)</li> <li>• No easily accessible disaggregated information for energy use during production (CCGA)</li> <li>• No easily accessible water quality and ag impact data (CCGA)</li> </ul>	<p>High:</p> <ul style="list-style-type: none"> <li>• Agri Environmental Report was discontinued (CCGA)</li> <li>• Fertility management information missing (CCGA)</li> <li>• No easily accessible disaggregated information for energy use during production (CCGA)</li> <li>• No easily accessible water quality and ag impact data (CCGA)</li> </ul> <p>Medium:</p> <ul style="list-style-type: none"> <li>• Missing standard metrics for sustainability in flax</li> </ul>
	Traceability			<p>Medium:</p> <ul style="list-style-type: none"> <li>• Missing ability to trace flax seed</li> </ul>
	Emerging			<p>Medium:</p> <ul style="list-style-type: none"> <li>• Need standardized data for social license (GFO)</li> </ul>
	Other			<p>Medium:</p> <ul style="list-style-type: none"> <li>• Information on organic market and production for flax</li> </ul> <p>Medium to Low:</p> <ul style="list-style-type: none"> <li>• Regular market intelligence reports on oats by Canadian embassies</li> </ul>