

The background of the entire page is a photograph of fresh vegetables, including several carrots with their green tops and one cucumber, resting on a rustic wooden surface. The vegetables are arranged in a way that they appear to be part of a larger collection, with some overlapping. The lighting is natural, highlighting the textures of the wood and the freshness of the produce.

Taking Stock

REDUCING FOOD LOSS AND WASTE IN CANADA

WASTE REDUCTION AND MANAGEMENT DIVISION,
ENVIRONMENT AND CLIMATE CHANGE CANADA

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FOREWORD

Methane is a powerful greenhouse gas generated following the disposal of food waste in landfills. As part of a range of activities focused on reducing methane emissions, under the [Strategy on Short-Lived Climate Pollutants](#), Environment and Climate Change Canada (ECCC) is consulting stakeholders on strategies to reduce avoidable food loss and waste. This report is designed to support stakeholder discussions by documenting the current state of knowledge and practice in Canada regarding food loss and waste. It was compiled to share information on existing policies, programs and initiatives currently taking place in Canada to reduce food loss and waste.

In 2015, Canada committed to the United Nation's 2030 Agenda for Sustainable Development, including Sustainable Development [Goal 12.3](#), which sets a target to “halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses” by 2030. Reducing food loss and waste can benefit Canadians by saving them money, improving the efficiency and competitiveness of the agri-food and agriculture sector, reducing greenhouse gas emissions, and will contribute to global efforts to address this issue.

Recent research estimates that 20% (or 11 million tonnes) of all the food produced in Canada annually becomes avoidable food loss or waste – food that could have been eaten, but was instead landfilled, incinerated or managed as organic waste (VCMI, 2019).

WHAT IS FOOD LOSS AND WASTE?

Food that is grown or harvested, but never eaten, is considered to be **food loss and waste**. For example, a piece of fruit that is damaged during transport; food items in grocery stores that spoil before they can be sold; leftovers from a meal prepared at home that are not eaten; or food dishes prepared in a restaurant that are never served and are instead discarded. The term **food loss** applies from the point of maturity of a crop or harvest up to, but excluding, the retail stage; whereas **food waste** is applied to the retail and final food preparation and consumption stages.

When food loss or food waste is disposed in landfills, it degrades over time to form methane, a greenhouse gas 25 times more powerful than carbon dioxide. Reducing food loss and waste prevents the generation of methane, and ensures that the energy, water, and land resources that go into growing our food are not wasted.



HIERARCHY OF SOLUTIONS

The food recovery hierarchy describes solutions to food loss and waste that maximize environmental, economic, and social benefits by prioritizing waste reduction and recovery of food over recycling and disposal. The hierarchy provides a framework for developing solutions at many levels – from deciding how to handle household food waste to developing local, regional, and national policies.

Recovery of surplus food to feed people is not proposed as a solution to food insecurity, but instead recognizes that the highest value of food is maintained when it is consumed by people. Recovery of surplus food can involve both donation to food banks or use in commercial operations to create new food products.

Hierarchy of Solutions To Address Food Loss and Waste

most preferred

REDUCE

Improve operations and practices to reduce generation

RECOVER

Donate surplus food to feed people
Manufacture animal feed or other food products

RECYCLE

Synthesize ingredients for products like pharmaceuticals, cosmetics, and fertilizers
Produce biodiesel from waste oils or renewable natural gas through anaerobic digestion
Create compost

DISPOSE

Send to landfill or incineration

least preferred



Canada's Food Supply Chain

At A Glance

In 2016, approximately 2.3 million people were employed in the production, transport, processing, distribution, and sale of food – representing 12.5% of the total workforce.¹

Canada is one of the world's largest exporters of agriculture and agri-food products. Roughly half the value of Canada's agricultural production was exported either as primary commodities or as a processed product in 2016.¹

Canada also relies on imports of both fresh and processed foods, mostly from the United States, the European Union, and Mexico.

The food sector accounts for about 7% of Canada's total gross domestic product (GDP).

In Budget 2017, the federal government set an ambitious growth target for the agri-food sector to increase exports from \$60 billion to \$75 billion by 2025.²



Production

- > In 2016, **over 193,400 Canadian farms** produced crops and livestock.
- > In recent years, Canadian greenhouse production of fruits and vegetables has increased to support consumer demand for fresh produce year round.³
- > With the same amount of total input, the average farm in 2011 **produced twice as much output** as it did in 1961.¹

Transport



- > Rail and sea are the primary forms of transportation for Canadian grain products.⁴
- > Air freight is used primarily to transport fish and seafood products.⁴
- > Virtually all foods end up at their final destination via road transportation.

Processing and Packaging



- > Food and beverage processing is the largest manufacturing sector in Canada with annual sales worth **\$112.4 billion** and **employing 285,100 Canadians**.⁵
- > Approximately **10,865 food and beverage processing businesses** operated in Canada in 2014.⁷
- > Most jobs in the processing sector are located in Ontario and Quebec, and most (90%) are small with less than 100 employees.⁶



Wholesale and Distribution



- > In 2016, there were **11,400 food wholesalers** and **1,474 beverage wholesalers** in Canada, **most with fewer than 100 employees**.⁷
- > The distribution sector is dominated by a few large companies, including Canada's major food retailers.

Retail Sales of Food and Beverages



- > Canada's retail market is mature and consolidated, with **5 major stores commanding 80% of the market**.⁸
- > In 2016, just over 23,000 food and beverage stores in Canada had fewer than 100 employees.⁷
- > The value of online grocery purchases in Canada grew 10.2% between 2012 and 2016, to \$431.2 million.⁹

Restaurants and other Food Services



- > There are nearly **97,000 restaurants, bars, and caterers** in Canada.
- > The restaurant industry directly employs more than 1.2 million people. One in five Canadians aged 15 to 24 is employed in the restaurant industry.¹⁰
- > Healthcare food service is the largest segment of the total institutional food service market.¹¹
- > From 2011 to 2016, total restaurant food sales **increased by 30.7%** compared to a 7.7% increase in food retail sales.¹²

Households and Consumers



- > In 2016, Canadians spent an average of **17% of household expenditures on food and beverages**, relatively low compared to other developed countries. Almost 30% of household food spending was at restaurants versus food purchased in stores.¹²
- > Public opinion research suggests that while most Canadian households do some meal and food purchase planning, many do not.¹³

¹ Agriculture and Agri-Food Canada, 2017. [An Overview of the Canadian Agriculture and Agri-Food System 2017](#).

² Agriculture and Agri-Food Canada, 2018a. [2018–19 Departmental Plan](#).

³ Statistics Canada, 2014. [The changing face of the Canadian fruit and vegetable sector: 1941 to 2011](#).

⁴ Conference Board of Canada, 2013. [Fast and Fresh: A Recipe for Canada's Food Supply Chains](#).

⁵ Agriculture and Agri-Food Canada, 2018b. [We Grow a Lot More Than You May Think](#).

⁶ Agriculture and Agri-Food Canada, 2018c. [Overview of the Food and Beverage Processing Industry](#).

⁷ Innovation, Science and Economic Development Canada, 2018. [Canadian Industry Statistics](#).

⁸ USDA Foreign Agricultural Service, 2018. [Gain Report: Canada Retail Foods Retail Sector Overview - 2018](#).

⁹ Agriculture and Agri-Food Canada, 2018d. [An Overview of E-Commerce Trends in Canada](#).

¹⁰ Restaurants Canada, 2018. [Canada's Restaurant Industry \(Infographic\)](#).

¹¹ Restobiz, 2017. [Institutional foodservice: One-tenth of Canada's foodservice industry](#).

¹² Agriculture and Agri-Food Canada, 2017. [An Overview of the Canadian Agriculture and Agri-Food System 2017](#).

¹³ Parizeau, 2018. Existing public opinion research on consumer food waste in Canada. Kate Parizeau, University of Guelph.



FOOD LOSS AND WASTE: From Farm to Fork

Food loss and waste occurs throughout the entire supply chain. Reducing waste and losses at each step of the process can save Canadians money, improve the competitiveness of the agri-food sector, and help to reduce greenhouse gas (GHG) emissions.

The following sections provide a glimpse of the existing actions being undertaken to prevent food loss and waste from happening at each point in the food supply chain. Another section outlines initiatives in place to recover and redistribute surplus food from this system. A summary of proposed key action areas is provided in each section.

Production

An estimated 13% of fruits and vegetables grown in Canada go unharvested or are discarded following harvest. A recent survey of producers noted land application, composting, anaerobic digestion and animal feed as the primary destinations for food loss at this level (VCMI, 2019).

CURRENT ACTIONS TO REDUCE FOOD LOSS AND WASTE

With the intention to improve profits for farmers and fisheries, many actions have been undertaken to address the underlying root causes of food loss. Some of these include:

- › **Marketing approaches and collaborations** to increase field gleaning, harvest and sale of second grade produce through programs such as [Misfits Ugly Produce](#) (Alberta), [Rebel Food](#) (British Columbia), [Second Life](#) (Quebec), [Naturally Imperfect](#) (Loblaws), and “[Les drôles de fruits et légumes](#)” (IGA). Quebec also repealed its Fresh Fruit and Vegetable Regulations under the Food Act in 2016, which previously prohibited the sale of produce that did not meet aesthetic standards.

Why food loss happens here

- › Culling to meet quality and cosmetic standards for produce
- › Seasonal fluctuations in supply and demand
- › Inadequate demand forecasting
- › Insufficient number of employees to harvest and handle produce
- › Inadequate storage, handling, and transportation infrastructure
- › Order cancellation
- › Overproduction to ensure contractual obligations are met
- › Economics of market price versus cost to harvest

- › **Tax credits** that support agricultural food donation activities are offered in [British Columbia](#), [Ontario](#), [Quebec](#) and [Nova Scotia](#) to help offset the cost to harvest, package, and store surplus harvest for donation.
- › **Support for innovations** that create new markets for agricultural crops, fishery catches and the inedible portions of food (e.g. [Fruit d’Or](#) – processing cranberry pits to produce cranberry seed oil). Innovation in Canadian agriculture is supported by Agriculture and Agri-Food Canada (AAFC), which has established funding programs such as the [AgriScience](#) and [AgriInnovate](#)



programs under the [Canadian Agricultural Partnership](#). The [Canadian Centre for Fisheries Innovation](#) has also conducted research on innovative approaches to reducing waste in fisheries.

- › **Research** programs at AAFC have focused on new approaches to extend shelf life and improve disease resistance for pre-harvest greenhouse grown vegetables. Other projects have investigated ways to recycle agricultural waste – creating new animal feedstocks or natural functional food ingredients, such as antioxidants.

KEY ACTION AREAS

The following key action areas were identified as opportunities to reduce food loss in the food production sector:

- › Research and measurement to better understand the significance and causes of food loss for specific commodities (VCMI, 2019).
- › Continued research to reduce losses and recycle waste – for example projects that support the development of new crops and/or varieties better adapted to extreme weather events, pests, and diseases and novel techniques to extract bioactive compounds from unavoidable food loss.
- › Identify solutions and develop guidance based on a value chain perspective (VCMI, 2019).
- › Address agricultural labour shortages (VCMI, 2019) and evaluate the viability to complement harvesting labour with automation strategies.
- › Analyze opportunities for process and business improvements within farming and harvest companies (VCMI, 2019) including improved forecasting methods to better predict market requirements.
- › Educate and raise awareness to change attitudes of industry and consumers regarding the aesthetic appearance of fruits and vegetables. Federal grading requirements could be clarified to distinguish grades attributed for quality purposes from grades attributed for safety purposes (IICA Canada and Laval University, 2018).
- › Support growers associations and extension services to disseminate and promote ways to avoid/reduce food loss, including the modernization of the on-farm sorting/grading and storage facilities.



Transport and Storage

Little is documented about the quantity of food lost during transportation and storage. Produce, meat and grain losses during transport are believed to be particularly high (Jedermann et al., 2014, Provision Coalition, 2014).

CURRENT ACTIONS TO REDUCE FOOD LOSS AND WASTE

As with food production, initiatives and technologies that improve efficiency can also help address root causes of food loss during transportation and storage, for example:

- › Transport Canada's [Crop Logistics Working Group](#) provides a forum where agricultural stakeholders exchange views and identify supply chain challenges and opportunities.
- › AAFC conducts research on innovative approaches and technologies related to preserving fresh produce (e.g. increased shelf life, reducing cold storage needs, preventing contamination by pests).
- › The Canadian Grain Commission provides storage [advice for producers](#) to prevent pest infestations.
- › An Ontario Produce Marketing Association funded [case study](#) on potato crops led by Value Chain Management International (VCMI) identified optimum post-harvest storage and handling approaches to minimize waste. The study demonstrates how producers and packers can collaborate to identify process adjustments that increase profits and reduce food loss.

- › The [Packaging Consortium](#) (PAC) has conducted research, published case studies, and undertakes **advocacy** for improved packaging and storage to reduce food losses throughout the supply chain.

KEY ACTION AREAS

The following key action areas are opportunities to reduce food losses in the food transport and storage sector:

- › Bringing the issue of food loss and waste to existing government and industry forums maintained by Transport Canada and AAFC could assist in examining regulatory barriers that contribute to food loss.
- › Research to identify key commodities and transport handling and conditions where losses are significant.

Why food loss happens here

- › Inadequate temperature and humidity control
- › Mishandling and compression
- › Spillage during transfers
- › Delivery delays
- › Rodents and other pests
- › Damage during transport



- › Building on existing case studies, share knowledge of best practices with Canadian companies.
- › Continue efforts to reduce bottlenecks in the food transportation network.
- › Consider opportunities to reduce transportation distances by supporting local production. The Government of Canada's Budget 2019 included a \$50 million, five year commitment for AAFC to develop a "local food infrastructure fund" to support Farmers' markets, food banks, and community-driven food-related projects.

Packaging, Processing and Manufacturing

Losses at the packaging, processing and manufacturing stage vary by food commodity and processing type. For example, recent data indicates that 1% of the sugars/syrups and 10% of the produce, meat and field crops that enter facilities at this stage become avoidable food loss. Although diverting to animal feed and landfilling are common approaches to waste management in this

sector, in 2015 almost 624,000 tonnes of food processing, slaughter, and rendering by-products were used as inputs to produce industrial bioproducts like biofuels, biochemicals, and biomaterials (AAFC, 2017).

Why food loss happens here

In addition to spoilage, losses during processing and packaging can occur due to:

- › Process and equipment inefficiencies and malfunctions resulting in products that do not meet quality specifications
- › Lack of flexibility to reincorporate or repurpose off-spec products
- › Inaccurate supply and demand forecasting
- › Rejection due to quality standards
- › Poor quality inputs
- › Production line changes
- › Trimming and culling



CURRENT ACTIONS TO REDUCE FOOD LOSS AND WASTE

Several multinational food and beverage companies with Canadian operations (including [Maple Leaf Foods](#), [McCain Foods](#), [Kraft Heinz Canada](#), [Unilever Canada](#), [General Mills](#), [Nestlé](#) and [Kellogg's](#)) have recently made public commitments to reduce operational food loss and waste. Smaller food processors may not have recognized how much food loss impacts their bottom line or have not made public commitments to reduce these losses.

Process optimization studies and waste assessments are used by several Canadian manufacturers to identify, track, and reduce food loss in their facilities. [Provision Coalition](#) plays a leadership role in developing tools and providing guidance to food processors on how to conduct food waste assessments, and advocates for increased awareness and education on the benefits of addressing food loss. Through their Food Waste Stakeholders Collaborative, Provision Coalition supports discussion and collaboration in addressing food loss and waste in the processing sector.

Resources have been developed to support food processors in evaluating opportunities for reducing food loss within their operations, including Provision Coalition's [Food Loss and Waste Solutions: Innovative Technologies and Best Practices](#), [Food Loss + Waste Toolkit](#), [Key Performance Indicator \(KPI\) Dashboard](#) and workshops that support root cause analysis, monitoring, measuring and tracking at the facility level. Assessment results help companies to understand the avoidable food loss and waste, including the embedded energy, water, labour, calories and financial impacts.

Innovative technologies, such as hyperspectral imaging and pulsed light, are used by some processors to optimize sorting, extend shelf life and reduce enzymatic browning of food commodities. A number of companies, including Nestlé and Unilever, use blockchain technology (via [IBM's Foodtrust platform](#)) to improve food traceability, which will help better target food recalls and reduce associated food loss and waste.

Funding for research and innovation - The [Canadian Agricultural Partnership](#) (Partnership), the latest federal-provincial/territorial agricultural policy framework, is a five-year investment that supports the growth, innovation, sustainability, and competitiveness of the agriculture and agri-food sector. This includes activities such as research on the commercial use of industry by-products. The Partnership replaces the 2013-2018 framework, *Growing Forward 2*. Agriculture and Agri-Food Canada has collaborated with a range of partners including industry and academia on scientific research projects, which have led to innovations in reducing food loss and waste at different stages of the supply chain.

Proposed regulatory approach - In April 2018, Ontario released its [Food and Organic Waste Policy Statement](#) that, among other actions, sets a target for industrial and commercial facilities to reduce food waste between 50 and 70% and to recover resources from this waste by 2025. The policy also indicates that large manufacturing establishments that generate more than 300 kilograms of food waste per week should identify where food waste occurs in their operations, conduct regular food waste audits to quantify the amount and type of food waste and take measures to prevent and reduce the amount of food waste that is occurring.

KEY ACTION AREAS

Where facility specific solutions are needed, reducing food loss will rely on the motivation of companies to measure and investigate the causes and costs of food loss within their own operations. The following key action areas are opportunities to reduce food loss in the food packaging, processing and manufacturing sector:

- › Continue work to raise awareness of the environmental and economic benefits of addressing food loss (VCMI, 2019).
- › Encourage facilities to measure food loss within their operations and to set reduction targets (VCMI, 2019).
- › Develop food industry approaches for lean/continual improvement assessments and provide training and support for implementation (VCMI, 2019).
- › Develop formal agreements between government and industry to increase corporate focus on this issue (VCMI, 2019).

Wholesale and Distribution

Distribution related losses appear low across most commodities, ranging from 1% (sugar/syrups and field crops) to 4% (fish and seafood) of food products that enter this stage (VCMI, 2019). Food losses may be sent to industrial composting or anaerobic digestion facilities, or disposed in landfills. De-packaging facilities can remove food that is no longer marketable from packaging and prepare it for organics processing.

CURRENT ACTIONS TO REDUCE FOOD LOSS AND WASTE

Inventory management - As with manufacturing, sophisticated management systems can optimize performance and reduce food waste. Linked inventory management systems (IMS) between distributors and retailers, combined with detailed knowledge of a store's layout and automation, can reduce handling times and exposure to suboptimal temperatures. Large Canadian distributors like Sobeys and Metro have either implemented or are planning to modernize and automate their networks of distribution centers to better handle fresh and frozen goods (Canadian Grocer, 2013).

A **case study** published in 2017 by VCMI for the Ontario Produce Marketing Association's [Food Waste Reduction Initiative](#) describes the short-term and long-term policy and procedural changes made by a food distribution company that resulted in reduced food losses, created savings, and increased sales.

KEY ACTION AREAS

Since retailers are also the largest distributors in Canada, corporate commitments to address food waste in their operations should have a significant positive impact on distribution losses.

The following key action areas are opportunities to reduce food losses in the food wholesale and distribution sector:

- › Educate and raise awareness within the sector of the environmental and economic benefits of addressing food loss.
- › Develop sector-specific approaches, training and support to undertake assessments to foster continual improvement and lean operations.
- › Adopt monitoring systems to evaluate and report on residence times of food products in facilities and optimize inventory management.

Why food loss happens here

- › Travel time and distance
- › Number of transfers
- › Packaging type
- › Inadequate temperature and humidity control
- › Inventory management
- › Rejection of produce that does not meet visual quality standards





Retail Sales

An estimated 12% of Canada's avoidable food loss and waste occurs during the retail phase of the supply chain (VCMI, 2019). This waste may be sent to industrial composting or anaerobic digestion facilities, or disposed in landfills. Donation of surplus food is common among the largest retailers (VCMI, 2019).

CURRENT ACTIONS TO REDUCE FOOD LOSS AND WASTE

Canada's largest retailers (including [Loblaw Companies Ltd.](#), [Metro Inc.](#), [Save-On-Foods](#), [Sobeys Inc.](#), [Walmart Canada](#)) have set food waste reduction targets (Provision Coalition, 2019). Specific initiatives undertaken by some retailers have included:

- › Training staff to improve produce display and handling, sorting, de-packaging, and recovery.
- › Developing and using standard operating procedures to improve quality and consistency.
- › Reviewing product specifications to allow more fruits and vegetables into grocery stores.
- › Adopting packaging improvements to extend the shelf life of food items.
- › Improving coordination and planning between replenishment and merchandising teams so the amount and selection of food shipped to stores matches forecasted sales.
- › Installing posters and infographics near waste bins.
- › Introducing employee challenges and reward systems to increase interest, participation, and quality of sorting.
- › Conducting daily waste audits to control overstocks and inform future purchasing.
- › Discounting and donating foods prior to reaching their date labels.
- › Engaging in customer education programs such as Love Food Hate Waste.

Many retailers focus on improving infrastructure and systems for donating surplus food (see Surplus Food Recovery and Redistribution), although there is less evidence of this amongst small and medium-sized food retailers.

Why food loss happens here

- › Rejection of produce that does not meet visual quality standards
- › Inadequate storage on-site
- › Goods damaged upon receipt
- › Inaccurate forecasting and poor inventory management leading to oversupply
- › Lack of protocols or networks to enable food rescue and redistribution
- › Withdrawal of products approaching or exceeding date labels

Technological solutions have been implemented to reduce food waste at the retail level:

- › Some large retailers regularly scan the stock keeping unit (SKU) numbers of products that leave as waste to provide data on the sources, causes and quantities of food products not sold, and to track the final destination of these items (e.g. donation, compost, landfill).
- › A number of free applications are emerging to connect grocers to consumers to provide real time information on discounts for foods that are approaching best before and expiry dates (e.g. [Flashfood](#), [Eatizz](#)).
- › Walmart is implementing blockchain technology (via [IBM's Foodtrust platform](#)) to improve food traceability, which will help to better target food recalls and reduce associated food loss and waste.

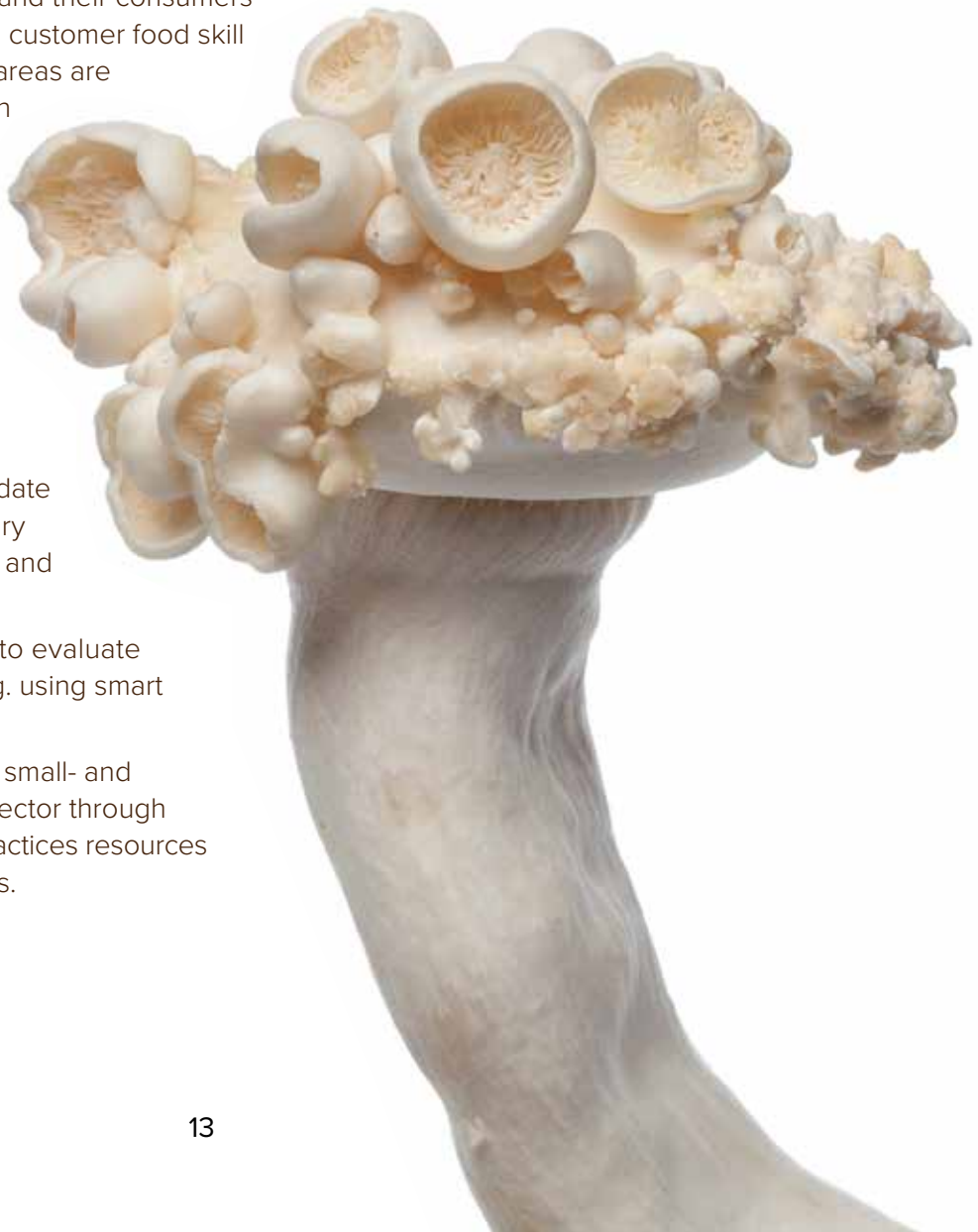
Educational resources:

- › British Columbia's Ministry of Environment and Climate Change Strategy has developed guidance to support food waste reduction by food retailers of all sizes: [Retail Food Waste Prevention Toolkit](#).

KEY ACTION AREAS

Retailers can play a key role in reducing food loss and waste – influencing both their supply chains (e.g. through procurement practices) and their consumers (e.g. through marketing practices and customer food skill education). The following key action areas are opportunities to reduce food losses in the food retail sales sector:

- › Foster pre-competitive sharing of best practices for reducing food waste between food retailers in Canada.
- › Use data analysis to better forecast demand and reduce surpluses and losses.
- › Analyze and address the issue of date labeling and its impact on inventory management in creating food loss and waste (NZWC, 2018) (VCMI, 2019).
- › Adopt technologies and systems to evaluate remaining shelf life in real time (e.g. using smart packaging, real-time reporting).
- › Improve engagement of the many small- and medium-sized businesses in this sector through awareness campaigns and best practices resources delivered by industry organizations.



Restaurants and other Food Services

Recent data collected from companies in the food service industry (including hotels, restaurants and institutions) indicates that the proportion of food purchased for sale by these establishments that becomes waste is significant – 21% of dairy, eggs and field crops, 38% of produce, and 20% of meat (VCMI, 2019). Currently, most companies addressing the issue focus on food donation, diverting from landfill, with an increasing number also identifying opportunities to reduce waste.

CURRENT ACTIONS TO REDUCE FOOD LOSS AND WASTE

Several large multinational restaurants and food service companies, including [Aramark Canada Ltd.](#) and [Sodexo Canada](#), have made public commitments to reduce food loss and waste.

A number of organizations have developed resources and tools to support food waste reduction in food service operations, including:

- › British Columbia's Ministry of Environment and Climate Change Strategy has developed a [Food Service Food Waste Prevention Toolkit](#) to support food waste reduction in the food service industry.
- › [LeanPath](#) and [Winnow Solutions](#) offer software-based analytics platforms and smart weight meter technologies that are used by some Canadian food service providers to track and identify opportunities to reduce food waste. Both also offer a range of resources to support and educate food service providers on approaches to reducing food waste.
- › Restaurants Canada and the Hotel Association of Canada have begun to offer training and resources to reduce food loss and waste. Certification programs that include evaluation of actions to reduce food waste in restaurants and hotels include [Leaders in Environmentally Accountable Foodservice](#) (administered by LEAF) and [Global Green Key](#) (administered in Canada by Hotel Association of Canada).

Why food loss happens here

Pre-consumer losses in the kitchen result from:

- › Food prepared but not served
- › Surplus inventory of ingredients
- › Inadequate storage

Post-consumer losses occur when:

- › Uneaten food is returned to the kitchen and must be disposed



[CHU Saint-Justine](#), a children's hospital in Quebec, undertook a major food services modernization, changing from a traditional heat-preserved meal service with a strict service schedule to a just-in-time system, in which food is prepared and trays are delivered at the convenience of patients. This change increased meal satisfaction rates and lowered uneaten meal rates, resulting in significant cost savings through food waste prevention.

KEY ACTION AREAS

The food service sector represents a significant opportunity to reduce food waste both within operations and within households. The large number of young employees in the food service sector may be receptive to the idea of reducing food waste and capable of generating innovative solutions. Education on how to avoid food waste within the food service industry could also influence household food waste as employees become informed and challenged to address the issue.

The following key action areas are opportunities to reduce food waste in the restaurant and other food services sector:

- › Simplified assessment and management tools to make food waste minimization easier for micro and small sized restaurants.
- › Industry organization leadership to raise awareness and develop sector-specific tools such as guidance on portions, menu design and serving systems that enable donation of excess food (VCMI, 2019).
- › Public health units and authorities could also play a role in disseminating information and providing education to food service providers through public health inspectors.
- › Procurement approaches that require minimization of food waste by service providers (VCMI, 2019).
- › Share best practices and identify innovative approaches to reduce food waste at institutions (including hospitals, schools, retirement homes, etc.) that provide food services.



Households and Consumers

Organic and kitchen waste makes up about 30% of the waste disposed by Canadian households. Studies indicate that produce (fruits and vegetables), breads and cereals are the most wasted food groups in Canadian homes, and that most of this waste is avoidable. However, research also indicates that many consumers are unaware of the avoidable food waste that they generate (Parizeau, 2018).

CURRENT ACTIONS TO REDUCE FOOD LOSS AND WASTE

Awareness and education: A number of resources have been developed by governments, industry, and non-governmental organizations to improve awareness of the causes and solutions to household and consumer food waste. Of note is the [Love Food Hate Waste \(LFHW\)](#) Canada national awareness campaign launched in 2018 by the National Zero Waste Council (NZWC) with retail and municipal partners.

- › British Columbia’s Ministry of Environment and Climate Change Strategy’s [resources on food waste](#) were developed to raise consumer awareness regarding the impact of food waste and to share solutions for reducing wasted food.
- › Educational resources on food loss and waste, developed by [Second Harvest](#), [La Tablée des Chefs](#), [Halton Food Council](#), and others, are available to support elementary and secondary school teachers in including discussion of the issue in the classroom.
- › The [Commission for Environmental Cooperation \(CEC\)](#) recently published a [Food Matters Action Kit](#) that contains informative resources and hands-on, creative activities to inspire North American youth to prevent food waste at home, at school and in their communities.
- › The Quebec Ministry of Agriculture has published [consumer guides](#) (French only) on date labels, food storage, food preparation, and food cleaning.
- › An illustrative list of Canadian organizations that have developed resources and projects for public education and awareness-raising is included in the Annex.

Why food loss happens here

- › Over-purchasing, lack of meal planning, and limited use of grocery lists
- › Spoilage due to improper storage
- › Concern for food safety and freshness - poor understanding of shelf life; confusing “sell by”, “use by”, “best before”, and “expiration” date labels
- › Eating preferences - willingness to store and eat leftovers, and the acceptability of eating food past peak freshness
- › Uninformed decisions - limited awareness of the costs and impacts of food waste



Increasing food literacy: One pillar of Health Canada’s [Healthy Eating Strategy](#) is an effort to improve the food literacy of Canadians. Improved food skills can help decrease household food waste by helping consumers to shop wisely and make the best use of the food they purchase. There are many Canadian initiatives focused on improving food literacy – one example is “[Regroupement des cuisines collectives du Québec](#)” which coordinates small collective kitchens to enable people to share time, money and skills in planning, purchasing and preparing healthy and economical dishes for their families.

Standardization and education on date labels: Improved clarity and understanding of “best before” date labels could contribute to better decision-making regarding the edibility of food and reduce premature disposal.

- › The Canadian Food Inspection Agency (CFIA) is reviewing national “best before” and “expiry” date labelling requirements and will introduce education programs to improve consumer understanding.
- › Food processors Kellogg’s, Walmart, Campbell Soup, Nestlé, Unilever, and other multinationals have signed a [Call to Action](#) to standardize food date labels worldwide by 2020.
- › In collaboration with Provision Coalition and ReFED, the NZWC hosted a [Date Labelling Workshop](#) in June 2018 to discuss challenges and possible solutions that could reduce the impact of data labels on creating food waste.

Packaging: Food waste can be reduced by packaging products in quantities that can be consumed within their expiry date, and in shapes that encourage full use. The [Packaging Consortium](#) has compiled a number of [case studies and examples](#) of packaging solutions that aim to reduce consumer level food waste.

Product innovations: Canadian research has focused on developing innovative approaches to prolonging shelf life including:

- › AAFC research on packaging and decontamination processes to identify technologies that will increase storage and shelf life, such as antimicrobial coatings for food packaging films to decrease food contamination risks.
- › The McGill Research and Innovation Consortium on Food Processing research on approaches to increase the shelf life of foods including: natural antimicrobials, high-performance packaging, nanoparticles and encapsulation.

- › The Quebec Agrifood Innovation Centre (QAIC) research on optimizing meat packaging and using hydrostatic high pressure processes to prevent meat losses and increase product shelf life. The QAIC offers innovation support and technology transfer services to companies in biofood and biotechnology sectors.



KEY ACTION AREAS

The following key action areas are opportunities to reduce food waste at the household and consumer level:

- › Consumer awareness campaigns, successfully implemented in other countries, have been a common action recommended by Canadian stakeholders (CBoC, 2014) (OWMA, 2015) (NZWC, 2018) (VCMI, 2019). With campaigns being undertaken by NZWC, supported by some retailers and large municipalities, a significant opportunity exists to collaborate and amplify the messaging being developed.
- › Integrating information on the solutions to, and benefits of, reducing food waste at home into food literacy and food focused educational programs for homes and schools is another avenue to increase consumer awareness.
- › Investigating and encouraging packaging innovations that increase the shelf life of perishable foods or provide optimal portion sizes have potential to support reduction of household food waste (NZWC, 2018) (VCMI, 2019).
- › Continued efforts to examine solutions to date label confusion among consumers has been widely identified by organizations who have studied this issue (NZWC, 2018) (VCMI, 2019).



Surplus Food Recovery and Redistribution



Food recovery and redistribution is the process of obtaining surplus, edible food from across the supply chain and redistributing it to local food programs or commercial enterprises that can utilize this resource, maintaining the highest value of food - as nourishment for people. While recovery and redistribution of safe, surplus food that would otherwise be lost or wasted across the supply chain makes the best use of resources that have gone into growing and producing it, this activity is not proposed as a solution to address food insecurity.

CURRENT ACTIONS TO RECOVER AND REDISTRIBUTE SURPLUS FOOD

Organizations such as [Food Banks Canada](#), [Food Banks of Quebec](#) and [Moisson Montréal](#) have established partnership programs with large grocers like Loblaws, Longo's, Sobeys, Metro, and Walmart. These large retailers have developed systems and invested in refrigerated equipment to recover, store, and deliver surplus food that cannot be sold. Organizations such as [Second Harvest](#), [Feed Nova Scotia](#) and [Refresh Foods](#) operate redistribution systems to recover surplus foods from all stages of the food supply chain. [La Tablee des Chefs](#) operates a system that recovers and redistributes surplus food from hotel, restaurant and institutional sectors. Second Harvest and Food Banks Canada rescued a combined total of almost 10 million kilograms of food in 2018.

Community refrigerators are also used in some areas across Canada to collect surplus foods from citizens and households so it can be shared with their communities. For example, [Sauve ta bouffe](#) maintains a directory of community refrigerators in Quebec.

Policies supporting surplus food donation

Tax incentives

The provinces of British Columbia, Ontario, Quebec, and Nova Scotia provide tax credits or deductions for farmers to help offset the cost to harvest, package, and store food for donation. Quebec additionally provides a tax credit for donation of certain foods by food processors.

Liability protection

Every province and territory has legislation that protects companies and individuals from civil liability for harm that might be caused by donation of surplus food.

Safety requirements for donated food

Provincial and territorial laws are also designed to ensure that any food collected for redistribution meets food safety requirements.

Second Harvest developed an on-line platform called FoodRescue.ca to facilitate the delivery of surplus food donations across Ontario by connecting food supply businesses that generate surplus food with local social service organizations and charities that can make use of the donated food. In Quebec, a similar on-line platform called [Food Exchange](#) was developed by Food Banks of Quebec.

Resources developed to support surplus food donation include:

- › The National Zero Waste Council's (NZWC) [Guidelines for Food Donations](#), which contains regulatory information from across Canada and informs donor and recipient organizations on how best to match foods available with foods required in a manner that meets the capacity and operations of both.
- › The British Columbia Centre for Disease Control's [Industry Food Donation Guidelines](#).
- › Quebec's Ministry of Agriculture, Fisheries and Food's [best practices and guidelines](#) on food donation.

Other organizations and companies have focused on utilizing surplus food to create added-value products that are then either donated or sold:

- › The Greater Vancouver Food Bank (GVFB) launched [Goodly Foods](#), a social enterprise that uses surplus food to produce soups, stews and sauces for distribution to GVFB members or for sale to food service partners.
- › The company, Loop, uses surplus fruit, vegetables and bread to create fresh juices, beer and dog treats.

KEY ACTION AREAS

With available guidance, and existing technologies to connect donors with recipients, donation of surplus food is one approach to making the best use of surplus food generated in the supply chain. Food redistribution is an approach that makes the best use of surplus food, but should be undertaken in parallel with efforts to reduce the generation of surplus food within a business or organization. The following key action areas are identified as opportunities to support surplus food recovery and redistribution:

- › Expand funding for storage and transportation infrastructure (e.g. refrigerated vehicles, refrigeration equipment and insulated food bags) to increase recovery of surplus food (specifically fresh and perishable food) and to increase geographic coverage of this activity.
- › Increase education for donors on the regulatory framework, liability protection, date labels and best practices for safe handling of donated food.
- › Examine policy barriers and business practices (e.g. crop insurance, and contractual obligations disallowing donation of surplus food) that impact the ability of companies to donate.
- › Broaden information systems to enable more food recovery organizations to track food donations needed, received, distributed and discarded.
- › Support industry innovation and partnerships to create new food products from surplus food from all parts of the supply chain.



RESEARCH and Data

SCOPING THE PROBLEM

In recent years, organizations such as the [Conference Board of Canada](#), [Provision Coalition](#), [Value Chain Management International \(VCMI\)](#), [National Zero Waste Council](#), [Commission for Environmental Cooperation \(CEC\)](#) and others have conducted research to explore food loss and waste in Canada. These studies have produced estimates of the amount, value, and impact of food waste in Canada, highlighted the reasons for loss and waste, and proposed approaches for assessing and addressing root causes. These studies have been supported by a mix of public and private sector funds.

QUANTIFYING FOOD LOSS AND WASTE

Except for audited municipal waste streams, loss and waste estimates are largely based on the extrapolation of limited data across the food sector (CEC, 2018). Data collected from the Canadian food sector in 2018 by Value Chain Management International (VCMI) has improved information on the scale of food loss and waste for specific food commodities (VCMI, 2019). [Enviro-Stewards Inc.](#) has helped a variety of businesses across Canada’s food supply chain to quantify and assess the impacts of food loss and waste within their operations, and establish realistic and practical solutions to [improve their bottom line](#).

ECCC, AAFC, and Statistics Canada are developing a framework for data collection and measurement to support priority setting and tracking of progress over time. This framework will depend, in part, on compiling data from individual facilities and companies to generate regional and national estimates of the flow of food loss and waste through the Canadian food supply system and into the waste management system.

The [CEC](#) published a practical guide entitled, [Why And How To Measure Food Loss And Waste](#), that provides a step-by-step plan for how companies and governments can begin the process of measuring food loss and waste. A global accounting and reporting standard (known as the [Food Loss and Waste Protocol](#)) has also been developed to assist organizations in quantifying food loss and waste.

RESEARCHING SOLUTIONS

Statistics Canada, AAFC, and several Canadian post-secondary institutions gather data and conduct primary research on food, the food sector, and consumer attitudes and behaviors towards food. Researchers at the University of Guelph have conducted both waste characterization studies and household interviews to try to identify trends and reasons for the creation of food waste. Other research focuses on new products and process improvements to increase efficiencies and create new markets for the food sector.

Other research has focused on identifying systemic problems and solutions. These include both private sector (VCMI, 2019) and post-secondary research (MacCrea, 2019). Université Laval has examined legal aspects related to food waste in Canada, including food donations, food labeling, and the impact of legislation and industry safety standards on food waste in the fresh produce sector (IICA and Laval, 2018).

Collaboration between food waste researchers is emerging – the University of Guelph Food Waste Research Group hosted a [“Building a Research Agenda for Reducing Food Waste in Ontario”](#) event in 2016 that brought together companies, policy makers, and academics to discuss priorities for action.

KEY ACTION AREAS

As an emerging issue, research and data gathering on food loss and waste will benefit from collaboration between research organizations in Canada. Sharing work plans and discussing ideas for research needs will avoid duplication of efforts and ensure that scarce research budgets have the greatest impact possible. The following key action areas are identified as opportunities to support research and data on food loss and waste in Canada:

- › A formal network or innovation hub that identifies food waste research priorities and shares research results would be a valuable resource for all parties involved in reducing food loss and waste in Canada (NZWC, 2018).
- › Continued work to develop a measurement framework along with clear definitions of food waste and communication of effective means for measuring it (Provision Coalition, 2014).



COLLABORATIVE Efforts

WHO ELSE IS INVOLVED AND HOW ARE THEY CONNECTED?

Food loss and waste is not a new issue. Although many governments, non-government organizations and companies have begun collaborating to better understand and address the problem, opportunities remain to expand and strengthen these efforts.

Government

Government initiatives can promote collaboration on issues like food loss and waste through setting high level reduction targets, consulting on strategies and policy approaches, and by directing funding towards projects that support collaboration in different areas – from research through to public education.

The [Canadian Council of Ministers of the Environment](#) (CCME) has traditionally played a role in promoting a coordinated approach for provincial and territorial authorities on waste issues through the [Waste Reduction and Recovery Committee](#). Organic waste has been one area of focus in recent years.

Provincial commitments to reduce food waste include:

- › British Columbia's [Climate Leadership Plan](#) which set a food waste prevention target of 30% by 2050. Guidance prepared to support the development of [Municipal Waste Management Plans](#) required under the Environmental Management Act encourages regional districts to plan for food waste reduction as part of their waste management plans.
- › Ontario's [Food and Organic Waste Policy Statement](#) includes proposed activities such as: developing awareness and education tools; directing food retailers and businesses to reduce food waste in their own operations; and working with schools to educate children on preventing and reducing food waste.
- › Quebec's [Politique bioalimentaire 2018-2025](#) commits to reducing waste and food losses, and promoting food donations. [Recyc-Quebec](#) included the reduction of food loss and waste in its [2016 action plan](#) on source reduction (with actions targeting both household waste and industry waste) to contribute to the objectives of the [Quebec Residual Materials Management Policy](#). Recyc-Quebec has also partnered with the National Zero Waste Council (NZWC) on the [Love Food Hate Waste \(LFHW\) campaign](#) and works with municipalities to reduce both food and organic waste going to landfill.

Several municipalities have taken a leading role in developing goals and implementing activities to reduce food waste within their boundaries. These include the City of Toronto's [Long Term Waste Strategy](#), Metro Vancouver's [Regional Food System Action Plan](#), and York Region's [Food Waste Reduction Strategy](#). The issue of food waste also falls within the mandate of food policy councils developed in Toronto, Vancouver and Montreal.





The [Federation of Canadian Municipalities](#) supports municipalities in efforts to improve the management of organic (including food) waste. They provide funding for emerging organic waste management technologies and are a hub for resources such as examples of bylaws for landfill organics bans and zero waste strategies.

The [Pacific Coast Collaborative \(PCC\)](#) – a network of Western North American jurisdictions (including British Columbia and Vancouver), have committed to a regional goal of halving food waste by 2030. In 2018, PCC partners invited leaders from the food product and retail industries to collaborate with west coast jurisdictions to:

- › Commit to reducing wasted food 50% by 2030.
- › Jointly create interim benchmarks to 2030 that address a full suite of options to measure, act, and report on reducing wasted food across the supply chain.
- › Develop tools to support industry in meeting this goal and ensure meaningful measurement and waste prevention practices by food retailers and their suppliers.

The Commission for Environmental Cooperation has supported collaboration between Canada, the United States and Mexico through completion of several [reports and projects](#) focused on food loss and waste. Most recently, this collaboration engaged experts from all three countries to establish a practical guide on [Why and How to Measure Food Loss and Waste](#) and a [Food Matters Action Kit](#) to support youth engagement in reducing food waste.

The 2019 federal budget allocated resources for a new initiative to reduce food loss and waste in Canada. This included a \$20 million fund for a Food Waste Reduction Challenge to foster innovative solutions for reducing food loss and waste in the food processing, grocery retail, and food service sectors. Additional resources were allocated to enable AAFC to lead federal action on food loss and waste, including efforts to reduce food waste within federal government operations.

Non-Governmental and Industry organizations

Canada has an array of food, packaging, and waste reduction associations, with mandates ranging from information-sharing to governance and self-regulation. Several of these have taken a leading role in identifying food loss and waste as an issue relevant to their sectors including:

- > National Zero Waste Council's Food Working Group - The National Zero Waste Council (NZWC) is a cross-sectoral leader focused on waste prevention in key areas of the Canadian economy including food. Members include companies, provinces, municipalities, and national governmental organizations like the CCME. Its focus on food loss and waste and networking efforts have motivated action by municipalities and organizations and engagement of actors throughout the supply chain. In 2018, NZWC published [A Food Loss and Waste Strategy for Canada](#) that recommended action in four key areas:
 - ⓐ Addressing issues associated with best before dates
 - ⓐ Infrastructure investments that strengthen the capacity of the charitable sector
 - ⓐ Development of a national consumer campaign
 - ⓐ Educational and communication materials that support nutritious food donations
- > Provision Coalition's Food Waste Stakeholders Collaborative provides the opportunity for industry representatives throughout the supply chain to interact and discuss approaches to reducing food losses in the food supply system.
- > Both National Zero Waste Council and Provision Coalition have been key collaborators that led to a recent commitment by eight leading Canadian companies— Kraft Heinz Canada, Loblaw Companies Ltd, Maple Leaf Foods, Metro Inc, Save-On-Foods, Sobeys Inc, Unilever Canada and Walmart Canada – to reduce food waste in their own operations by 50% by 2025. The companies will measure and report on individual progress annually (Provision Coalition, 2019).
- > Sustain Ontario's [Ontario Food Collaborative](#) initiative on decreasing wasted food is an example of a municipal and researcher interface that enables municipal food waste reduction programs to be informed by the best available research.
- > Food rescue organizations including [Second Harvest](#), [Food Banks Canada](#), [Moisson Montréal](#), [La Tablee des Chefs](#) and others create and mobilize surplus food recovery and redistribution systems along the entire food supply chain.





KEY ACTION AREAS

Governments have had a role in the regulation of food production and trade throughout history and are relied upon to help ensure a secure supply, public health and safety, affordability, and environmental and economic sustainability. All orders of government – federal, provincial, territorial, and municipal – have authority over matters that can directly or indirectly influence the creation of food loss and waste. This represents an opportunity to identify particular policy and regulatory barriers and levers that could reduce food loss and waste in Canada. Several of these issues – food safety, transportation bottlenecks, limitations on human resources, and waste management – have already been recognized as areas of opportunity, but others may exist. Governments also have important roles to play regarding awareness-raising and education.

Existing government-industry interfaces such as AAFC's [Value Chain Roundtables](#) touch on many of the possible solutions, impacts, and root causes of food loss and waste in the supply chain, including innovation, environmental impact, and transportation infrastructure. Appropriate government-industry interfaces could be leveraged to facilitate focused discussions on food loss and waste.

Industry organizations are well placed to leverage sector expertise to identify appropriate solutions and encourage adoption, where business cases exist. Enhanced engagement of industry associations could support increased awareness of the issue throughout the supply chain.

Appropriate geographic collaborations – like the Pacific Coast Collaborative (PCC) – could be beneficial, recognizing the regional nature of activities at some levels of the supply chain (production, processing) and the national scope of others (transport, distribution).



WHERE DO WE GO

From Here?

The early leadership shown by both private and public sector organizations to conduct research, to develop tools and approaches, and to begin engaging companies in the food system, provide a solid foundation for the next steps towards reducing Canada's food loss and waste.

- > **Engagement across the supply chain:** Visible early action to reduce food losses in the food supply chain has been undertaken by large companies, primarily in the food processing and retail sectors. It is less evident whether small to medium-sized companies have considered investigating food loss as an issue within their businesses. Leveraging existing guidance and assessment techniques that have been developed (e.g. root cause analysis, measurement approaches), efforts to engage and educate small- and medium-sized businesses may be considered a priority next step.
- > **Expansion of existing actions across Canada:** Early work to address food waste at the consumer stage has been undertaken by large municipalities, primarily within Metro Vancouver and the Greater Toronto Area. Although these municipalities are home to a large portion of Canada's population, efforts to increase awareness and actions to reduce consumer waste throughout Canada could yield substantial results.
- > **Collaboration networks:** The food system in Canada spans a large geographic area, a wide variety of processes, and includes many actors – companies, associations, individuals, and multiple departments in all orders of government. Connecting all of these players could be a challenge; however, the establishment of focused collaboration networks around specific issues would be valuable. The ability to share work plans, collaborate in research and discuss findings could result in accelerated progress. Networks focused in the following areas could be of particular interest and include different actors, depending on the issue:
 - Ⓐ Consumer education and awareness.
 - Ⓐ Investigation of regulatory barriers.
 - Ⓐ Sector specific education and guidance materials.





- › **Research agenda:** Understanding the current baseline level of food loss and waste – both on a national and business level – is a key next step in creating solutions. Defining the issue quantitatively will define opportunities for reduction and allow targets to be set. The availability of data to track progress in reducing food loss and waste is key to being able to determine if efforts are paying off. Continued research to uncover the root causes for food loss and waste throughout the supply chain will enable the identification of solutions and direct education and awareness activities. Developing and sharing the results of pilot projects to test new approaches for reducing food loss and waste can lead to replication of successful efforts across the country.
- › **Policy change:** Although work has been undertaken to conduct policy research in some areas, a full analysis of regulatory barriers that may contribute to the creation of food loss and waste has not been completed. This analysis would be strengthened through consideration of the economic and marketing systems of Canada’s food supply and the potential for these systems to influence food loss and waste. An analysis of current policies and identification of potential policy changes could be conducted collaboratively between relevant federal, provincial, and territorial governments.



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ANNEX

Canadian Guidance and Educational Resources to Support Food Loss and Waste Reduction

GUIDANCE AND RESOURCES DEVELOPED FOR BUSINESSES AND MUNICIPALITIES

FIELD	ORGANIZATION	RESOURCE
Production	British Columbia's Ministry of Agriculture	Agricultural Waste Disposal - Best Practices Guide
Processing	Provision Coalition	Library of resources, toolkit, case studies, reports, and solutions
Retail	British Columbia Ministry of Environment and Climate Change Strategy	Retail Food Waste Prevention Toolkit for business owners and operators
Food Service	British Columbia Ministry of Environment and Climate Change Strategy	Food Service Food Waste Prevention Toolkit for business owners and operators
	Metro Vancouver	Tools and resources for restaurants - reducing and diverting food waste
Food Donation	National Zero Waste Council	Guidelines to Minimize Wasted Food and Facilitate Food Donations
	British Columbia Centre for Disease Control	Industry Food Donation Guidelines
	Found Nova Scotia	Best Practices: Harvest Potential of Forgotten Foods
Household and Consumer	Sustain Ontario	Reducing Household Food Waste: A Municipal-Regional Toolkit
	British Columbia Ministry of Environment and Climate Change Strategy	Residential Food Waste Prevention - ToolKit for Local Government and Non-Government Organizations
	Recycling Council of Ontario	Webpage hosts resources on food waste of interest to organizations

WEB RESOURCES DEVELOPED TO SUPPORT IMPROVED HOUSEHOLD AND CONSUMER AWARENESS

REGION	ORGANIZATION	RESOURCE
National	Canadian Centre for Food Integrity	Best Food Facts provides resources on food and food system
	National Zero Waste Council	Love Food Hate Waste Canada provides tips and resources for consumers
	Waste Reduction Week Canada	Food Waste Resources shares information on solutions to food waste aimed at consumers
Quebec	Éco-Quartier Ahuntsic-Cartierville	Ville en Vert food waste reduction tools for consumers and business
	La Tablee des Chefs	La Tablee des Chefs offers culinary workshops, information and tips to support food waste reduction at home and in restaurants
	Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec (MAPAQ)	Food waste information and tools for consumers and households
	Recyc-Quebec	Recyc-Quebec food waste website tips and resources for consumers, municipalities and businesses
	Sauve ta Bouffe	Resources to reduce food waste at home and in restaurants
Ontario	City of London	"theheal.ca" shares solutions to reduce household food waste
	City of Toronto	Food waste web page with information for residents on how to reduce food waste
	York Region	Good Food program shares healthy eating strategies and meal planning

WEB RESOURCES DEVELOPED TO SUPPORT IMPROVED HOUSEHOLD AND CONSUMER AWARENESS

REGION	ORGANIZATION	RESOURCE
Saskatchewan	Saskatchewan Waste Reduction Council	Food waste web page with tips and resources for consumers
Alberta	Alberta Health Services	Resources on food planning, preparation, storage, and leftovers
	City of Edmonton	Food Waste Reduction Program provides information, household behavioral research and waste audit
British Columbia	Metro Vancouver	Food Scraps Recycling tools and resources for detached homes, apartments and condos

EDUCATIONAL RESOURCES ON FOOD WASTE DEVELOPED FOR YOUTH AND SCHOOLS

REGION	ORGANIZATION	RESOURCE
North America	Commission for Environmental Cooperation	Food Matters Action Kit – inspires youth of ages 5 to 25 to prevent food waste at home, at school and in their communities
National - English	Earth Rangers	Food For Thought school activity – Grade 6
National - French	Éco Héros	Guerrier anti gaspillage – school presentation La bouffe - il faut y penser – school activity – Grade 6

EDUCATIONAL RESOURCES ON FOOD WASTE DEVELOPED FOR YOUTH AND SCHOOLS

REGION	ORGANIZATION	RESOURCE
Ontario	Halton Food Council	Public & Student Educator Toolkit – The Journey of Wasted Food – Grades 4 to 6
	Hot Docs – Docs for Schools	Learning resources for the Ontario secondary school curriculum for the movie: Just Eat it: A Food Waste Story – Grades 7 to 12
	Second Harvest	Curriculum and learning activities for educators to raise awareness of food rescue and recovery – Kindergarten to Grade 12