Less Food Loss and Waste, Less Packaging Waste

REPORT SUMMARY

zeroWASTE
NATIONAL ZERO WASTE COUNCIL
An Initiative of Metro Vancouver

The National Zero Waste Council, an initiative of Metro Vancouver, is a leadership initiative bringing together governments, businesses and non-government organizations to advance waste prevention in Canada

ACKNOWLEDGEMENTS

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INTRODUCTION

Food loss and waste (FLW) is at crisis levels. In Canada alone, each year, 11.2 million metric tonnes of avoidable FLW occurs. The total financial value of this food is $49.46 billion and there are environmental costs as well. The greenhouse gas (GHG) emissions of this amount of food waste equates to 22.2 million tonnes. There has also been a growing concern about the ever-expanding amount of plastics and other packaging materials – including materials used to package food - ending up in landfills and ocean environments. At the same time, globally respected organizations recognize sustainable packaging options play an important role in today's global food industry by preventing the occurrence of FLW.

How do we address these intersecting concerns and issues? Presently, there are a lack of incentives for the food industry to modify its packaging and marketing practices to reduce FLW along the value chain; or to motivate consumers to purchase and manage food and packaging in the home more responsibly. There is also a lack of motivation for companies to design products for recycling and composting. Also, because the decisions on packaging design (including the degree to which they are recyclable or compostable) are, for the most part, decoupled from how local governments manage solid waste, decisions on packaging that would lead to less food waste have not been implemented. Addressing this situation requires a mix of economic tools that stimulate new markets and behavioural changes to drive systemic innovation along the entire packaging and food value chain.

Recent research exploring the intersection of FLW and packaging finds that the former leads to the greatest GHG emissions; and that while challenging, we **do** have the means to reduce waste in both packaging and food

Good food packaging protects products from damage, extends shelf life, improves food safety, enables traceability, provides important information to consumers and more. Yet pollution, caused by the use of sub-optimized packaging materials and waste management systems, illustrates the problems of a linear economy. Value is created in this economic system by producing and selling as many products as possible, and waste appears to have no value.

How then do we best understand the intersection of FLW and packaging? If we are looking to reduce our environmental and economic impact associated with waste, should we package food, or not? Are there particular types of food that require packaging to maintain its value? Are there better packaging materials than others? And which foods are best suited for selling without packaging?

NEW RESEARCH

Under the direction of the National Zero Waste Council and project partners, questions about the intersection of FLW and packaging were posed to the consulting firm, Value Chain Management International (VCMI). VCMI was invited to lead an in-depth exploration of how the issues of FLW and packaging are interwoven. As a result, the research report *Less Food Waste, Less Packaging Waste* identifies how FLW and packaging waste, and their combined GHG emissions, can be reduced.

The solution is not to eliminate food packaging. The report finds that the widespread removal of packaging would lead to an exponential increase in food waste as well as GHG emissions. Packaging plays an important role in extending shelf life. Extending shelf life is important to reducing food waste. For example, WRAP (2015) found that one additional day of shelf life can reduce avoidable food waste by 200,000 tonnes annually.

Innovation, rather than eliminating packaging, is required to reduce environmental and economic impacts from food and packaging waste, according to the VCMI research. This innovation needs to be system-wide: in supply chain management, package product design, in food marketing, and in material collection. While supply chain and innovation decisions can positively reduce environmental impacts, significant policy and practice reform at the point of material collection is going to be needed to ultimately deliver a significant reduction in food and packaging waste as well as greenhouse gas emissions.

The report found that actions to deliver on reducing food loss and waste, as well as packaging waste, fell into five main categories:

1. Reduce food loss and waste — this includes optimizing the sale of loose/bulk as opposed to prepackaged food products
2. Address unnecessary and problematic food packaging
3. Increase recyclability of packaging and improve recycling infrastructure
4. Increase and improve composting and anaerobic digestion infrastructure
5. Accelerate development of new packaging materials and solutions

The foods most suited to selling loose or in bulk are drier, hardier, and more shelf stable.

METHODOLOGY

The research used a combination of secondary and primary data analysis. Following an extensive literature review, primary data was collected from 220 influential stakeholders in industry, government, NGOs, and research institutes in Canada. Research findings from the first two phases guided the development of scenarios that explored trade-offs associated with various packaging choices — including whether to package food at all. GHG emissions associated with different scenarios were calculated using the WARM model accompanied by a lifecycle analysis. Finally, a circular economy lens was applied to the development of solutions and recommended actions that would advance less FLW waste as well as less packaging waste.

While there is a vast array of different food items, the study focused on 12 food types that together represented critical food categories useful for whole chain FLW analysis. The research considered different supply mechanisms (fresh vs. frozen) and four different packaging material types (glass, tin, cardboard, and plastic) to produce findings that could be extrapolated across the wider food industry. The research report focused on primary or sales packaging; that is, the packaging that shoppers take home.

Leafy greens

Berries

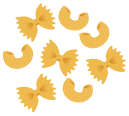
Apples

Granulated Sugar

Fresh chicken

Beef burgers

Liquid Milk



Dried Pasta

Shrimp -frozen

Fresh fish fillets

Yogurt

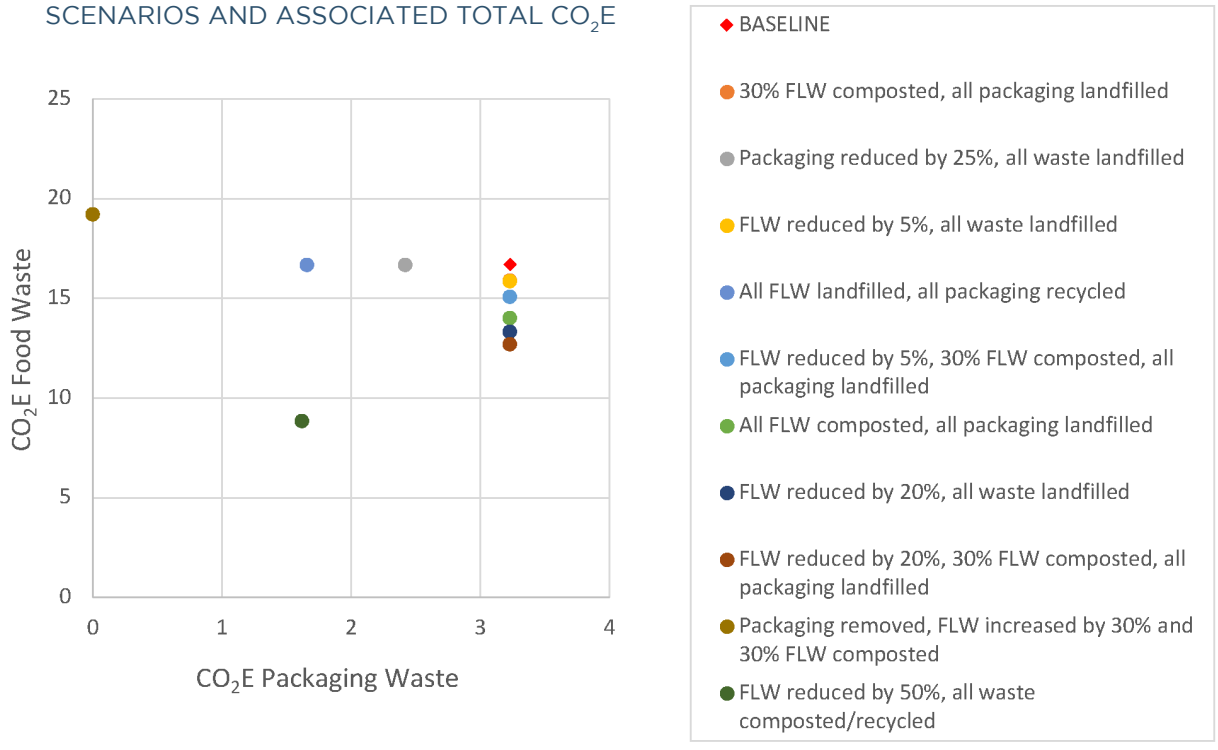
Bread

KEY FINDINGS

SCENARIO ANALYSIS: TO PACKAGE OR NOT TO PACKAGE

The scenario analysis used in the report demonstrates that decreasing food loss and waste, as opposed to reducing packaging, has the greatest impact on reducing the environmental footprint of the food system -measured in terms of greenhouse gas emissions. In terms of reducing the environmental impact of packaging, the greater the utilization of post-consumer resin (PCR) content in the manufacture of packaging, the less FLW must be reduced to offset GHG emissions of packaging. While this is not necessarily the approach advocated, it demonstrates how scales of action are balanced with respect to GHG generation.

The graph below illustrates how GHG emissions associated with FLW and packaging waste varies by actions taken. The scenario analysis begins with a baseline that includes anticipated amount of waste associated with the 12 food groups researched, as well as the assumption that all packaging is considered as "waste" and sent to landfill. In addition to estimating the GHG emissions associated with baseline, ten different scenarios are defined by changes in assumptions about the amount of FLW generated, the amount of packaging used, and opportunities to recycle or compost waste as opposed to landfill.



HOW TO REDUCE THE ENVIRONMENTAL IMPACT OF PACKAGING

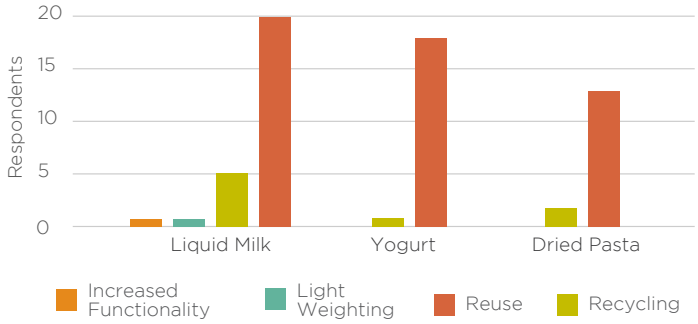
Once the value of packaging has been established, the study considered the effectiveness of the four common types of packaging and product combinations for preventing FLW: plastics, glass, tin and cardboard/paper. This involved collecting survey information from the 220 stakeholders who were asked to rate the various packaging options on a scale of 1 to 5. In general, respondents viewed plastic as the most viable material for preventing FLW across all 12 of the food types. While glass, tin, and cardboard/paper were deemed effective in specific situations, respondents did not consider them a viable primary packaging option for preventing FLW in most foods.

Prepackaged or bulk/loose: Respondents indicated that four of the foods—leafy greens, apples, granulated sugar, and dried pasta—lend themselves to being sold loose (not prepackaged). The foods most suited to selling loose or in bulk are typically drier, hardier, and more shelf-stable. Fresh chicken, berries, milk, yogurt, fresh fish fillets and frozen beef burgers are not suited to being sold loose. The benefits of selling loose/bulk also depends on consumers' purchasing preferences and behaviour in the home.

Efforts targeted at reducing FLW and packaging waste include optimizing packaging design and establishing systems and infrastructure that support a circular food system. The report considers the environmental impact of offering consumers the option of purchasing foods in bulk in addition to other packaging options. What is clear is that the food and packaging industry, along with governments and consumers, must be part of the solution to reduce both food loss and waste as well as waste from packaging.

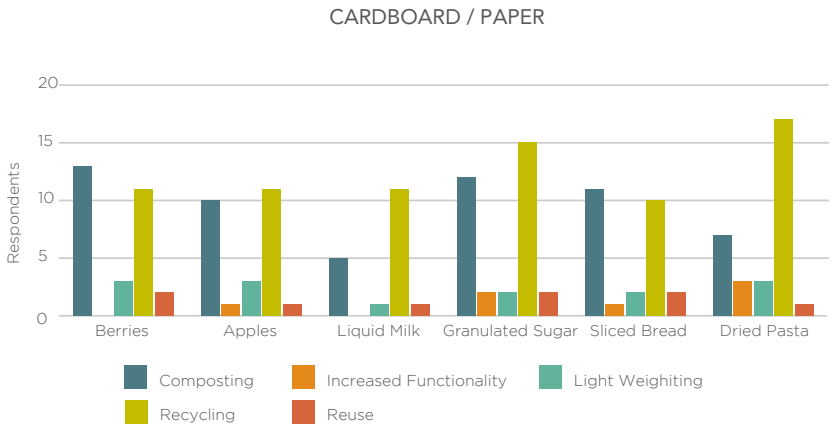
REDUCING ENVIRONMENTAL FOOTPRINT OF GLASS PACKAGING

Glass: Most respondents view reuse of glass as the best option to reduce the environmental footprint of packaging. However, this can be a challenge, as retailers are reluctant to allow consumers to bring glass containers into their stores, due to fragility and food safety concerns.



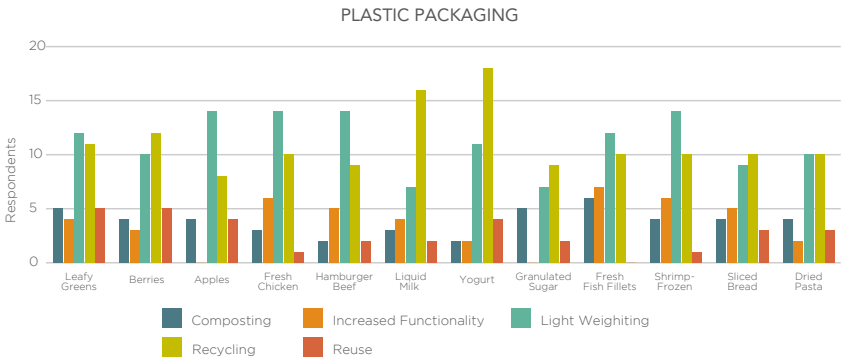
REDUCING ENVIRONMENTAL FOOTPRINT OF CARDBOARD/PAPER PACKAGING

Cardboard/paper packaging: Reducing the environmental footprint of cardboard/paper packaging will be achieved primarily through increased recycling and composting. This option is available for six food types: berries, apples, milk, granulated sugar, sliced bread, and dried pasta where cardboard/paper packaging is seen as an effective option for reducing FLW



REDUCING ENVIRONMENTAL FOOTPRINT OF PLASTIC PACKAGING

Plastic packaging: The most preferred means to reduce the environmental footprint of plastic packaging is to increase recyclability, followed by light-weighting. Light-weighting, that is reducing the weight of packaging including bottles and jars while maintaining, or even potentially improving, the shelf-life or safety of a food type. An example of light-weighting includes the use of thinner plastic wrap on English cucumbers and the introduction of top-seal packaging for fresh foods

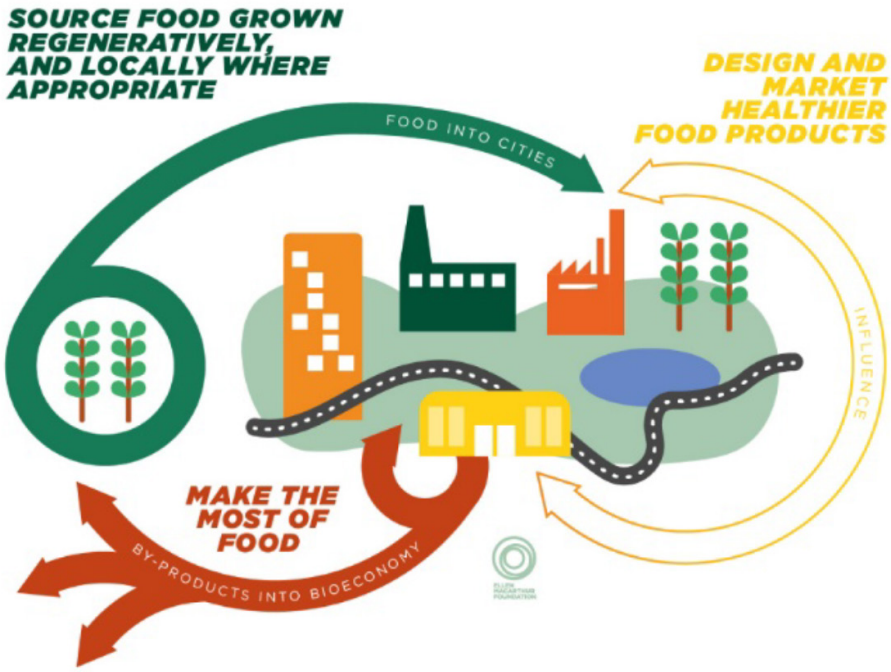


ENABLING A CIRCULAR ECONOMY IN FOOD

Respondents were also asked how choices in food packaging could contribute to the efficient and effective rescue/recovery and redistribution of excess edible food. Increasing the amount of safe, edible food recovered and redistributed to community organizations as well as enabling the composting of food waste are important steps in a circular food system. The respondents were presented with a list of identified hurdles to establishing an economically viable circular economy in food. From this list of 14 barriers, they identified six as significant, with over 75 percent of respondents rating them as having a considerable impact.

Significant barriers to a circular food system in Canada:

1. Lack of appropriate composting and recycling infrastructure.
2. Inconsistent provincial or municipal regulations regarding material collection and processing.
3. Inconsistent provincial or municipal recycling programs.
4. Confusion of consumers around how to modify their behavior in terms of purchasing and storing food, and how to embrace re-use with respect to packaging options.
5. Cost and required capital investment in the development of new technologies, infrastructure, materials and programs/processes.



SOURCE: ELLEN MACARTHUR FOUNDATION (2019)

SCENARIO ANALYSIS: CONCLUSIONS

The report confirmed earlier research findings that the right kind of packaging can significantly contribute to reductions in FLW. However, without the use of systems thinking and collaborative actions, the fundamental barriers to moving towards a circular food system cannot be addressed. Until then packaging innovations that lead to less FLW will be one-off solutions. From a climate change perspective, this research confirms that prioritizing reductions in FLW is essential but efforts to reduce packaging waste is also important.

An analysis of scenarios in the report showed that reducing FLW has the most significant impact on the environmental footprint of the food system. While the percentage of total emissions represented by packaging differs quite markedly by food item, when aggregated across the 12 food types included in the analysis , packaging manufactured from virgin materials represents five percent of total GHG emissions. The higher the use of post-consumer resins (PCR) in the manufacture of plastic packaging, the less FLW must be reduced to offset GHG emissions of packaging. This is an important consideration for those who might feel they have to chose between two paths of action. Meeting the most ambitious FLW reduction target (and greatest GHG emission reduction) explored in the scenarios will be a challenge. While delivering on a reduction in both FLW and packaging waste is the desired end goal, a balanced approach is going to be needed. Reductions in both types of waste -and in GHG emissions - can happen where a combined approach is used. One that includes using more PCR in plastic package manufacturing upfront, and phasing in ever-higher amounts of FLW reductions.

While supply chain and innovation decisions can positively reduce environmental impacts, significant policy and practice reform at the point of material collection is also required to deliver a significant reduction in waste and GHG emissions. Innovations include addressing problematic and unnecessary packaging, improvements to recycling infrastructure and composting, and accelerated design of new packaging solutions. These are among the ways to achieve packaging optimization.

Beyond the supply chain, reducing food waste will involve changing food buying and storage behaviour as well as meal planning and preparation in households across Canada. To assist with this, the National Zero Waste Council is running a consumer-facing campaign Love Food Hate Waste Canada. The campaign is raising awareness of food waste generated by households and provides guidance on meal planning and proper food storage. Food retailers can discontinue marketing that encourages consumers to purchase perishable foods in large volumes. For those foods and beverages that are suited to selling in loose/bulk, this method of sale might help consumers purchase only what they need. The private and public sector can also work together to increase consumer awareness of how best to store and prepare foods to minimize waste. Other ways of reducing food waste include tailoring pack size to specific markets and improving cool chain management to enhance the safe redistribution of healthy foods to food banks and community organizations.

Greenhouse growers have reduced the volume of Canadian packaging materials by over 4,500 tonnes annually.

RECOMMENDATIONS

After examining and latticing the results from the various phases of the research, recommendations for moving forward on reducing both FLW and packaging waste fell into five categories:

- **Reduce FLW — this includes optimizing the sale of loose/bulk vs. pre-packaged**
- **Address problematic and unnecessary food packaging**
- **Improve recycling infrastructure**
- **Improve composting/anaerobic digestion infrastructure**
- **Accelerate development of new packaging materials and solutions**

The report proposes several interventions from the food industry, packaging manufacturers, recyclers and composters, and government, under a delivery model designated: “Do now” (1–2 years), “Do soon” (3–4 years), and “Build a plan” (5+ years) model.

Among the immediate recommendations for the food industry, the report suggests increasing the sale of loose/bulk foods where possible and to also educate consumers on bulk buying. Suggested next steps include mandating a minimum PCR requirement and ensure all packaging is recyclable or compostable.

The report recommends packaging manufacturers increase use of post-consumer resin materials in the short-term and implement certification of recyclable or compostable packaging based on common standards for the next phase. In the long term, packaging manufacturers need to incorporate greater usage of PCR than virgin materials.

Recyclers and composters are encouraged to develop strategies to implement common minimum PCR standards in the short-term, invest in infrastructure for the mid-term, and ensure those standards are fully implemented by 2025.

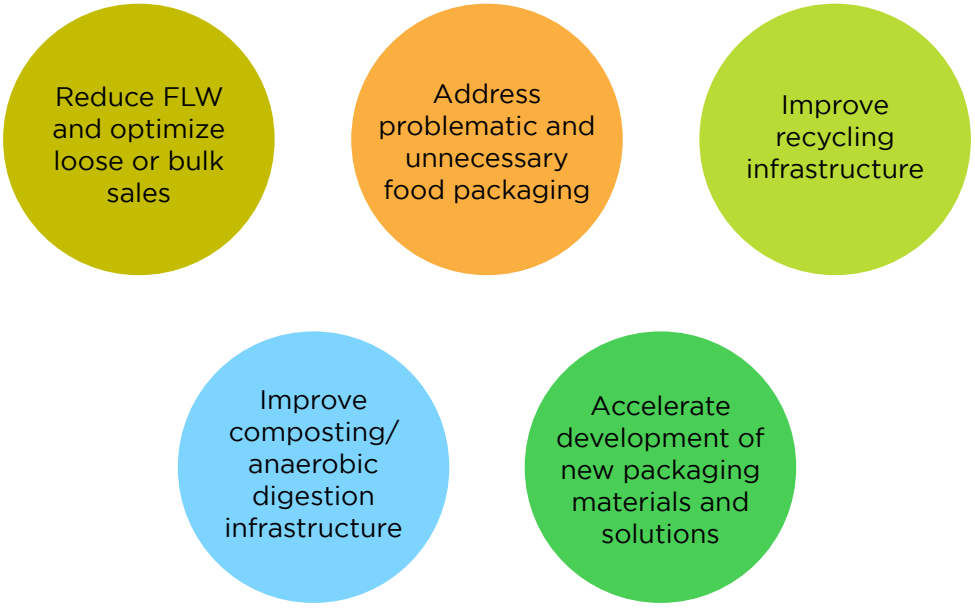
The report recommends the packaging industry develop a science-based framework for establishing packaging solutions, recyclability, and composting in the first phase, then monitor and report on industry performance. For the last phase, the industry needs to verify that manufacturers are operating according to minimum common national standards.

Innovation, rather than the elimination of packaging, is key to reducing waste.

Regarding the recycling and compost industry, the report recommends establishing minimum standards and frequent communication on best practices related to packaging solutions and composting, and create a national recycling and composting infrastructure strategy. Suggested next steps include implementing the strategy, and monitoring and reporting on performance according to established targets. This 2025 and beyond recommendation is to audit the industry to verify that facilities are operating according to national specifications.

The report also recommends government confirm science-based standards to categorize packaging materials and assist with implementing extended producer responsibility (EPR) and low carbon assessment strategies.

The next steps would introduce legislation that mandates minimum post-consumer recycled content, along with encouraging private investment in recycling, composting and anaerobic digestion infrastructure. In the long-term, the report advises that the government bans packaging materials and organics from landfills, along with monitoring and reporting EPR performance.

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