

The Spent Goods Company

Beer -> Bread! Upcycling and Commercializing Food Waste

Food Loss and Waste Prevention Case Study

Organization

[The Spent Goods Company](#), founded in Toronto, ON, Canada in 2018, aims to prevent food loss and waste by teaming up with local breweries and bakeries to turn “spent” beer grains into new products. These products include loaves of bread, bagels, English muffins, buns, and snacks such as crackers and pretzels. Following this approach, Spent Goods demonstrates the role business can play in reducing waste and minimizing environmental impact, while creating a delicious, nutritious product that generates income for participants throughout the food supply chain.

Introduction

In brewing beer, grain used in the brewing process becomes “spent,” leaving a solid by-product composed of barley husks and other edible components of the barley. This residue comprises roughly 85% of brewing waste and is typically sent to landfills, or in some situations, applied to fields as a fertilizer or fed to animals.¹ Spent Goods estimates that approximately 16 million kilograms of spent grains are generated each year in Ontario, with the vast majority landfilled.²

However, spent grains from brewing are highly nutritious, containing high amounts of protein and fiber. Because of this nutritional content, they are well-suited to be used as a substitute for a portion of the traditional flour in baked goods and other such products. If repurposed for food production, the 16 million kilograms of spent grains generated in Ontario each year could generate more than 18 loaves of bread annually for each resident of the province.

Spent Goods Company works to prevent spent grains from being sent to landfill or other lesser uses by creating links between breweries and bakeries to generate food from spent grains, rather than waste. Many breweries are aware

What was done to prevent FLW?

The Spent Goods Company repurposes “spent” grains used in the beer-brewing process and facilitates the production of new products with ingredients that otherwise would have gone to landfill.

How was it done?

The Spent Goods Company works with local brewers and bakeries to build partnerships, overcome logistical hurdles, and prevent nutritious grains from being sent to landfill.

What were the outcomes?

Approximately 1600 kg of spent grain were prevented from being sent to landfill between 2018-2020, preventing 1.8 tons of GHG emissions, and generating new revenue for companies throughout the food supply chain.

that spent grains have a higher use but face a logistics problem, as spent grains can be heavy and difficult to transport. Additionally, there can be a “mismatch” between supply and demand: sometimes the brewery may be ready to dispose of the spent grains before the bakery is able to use them.

Spent Goods Company facilitates the transportation and storage of these grains while passing between breweries and bakeries, thus minimizing costs for businesses in the supply chain and diverting waste from landfill. The grains are collected from the brewery, frozen to preserve them, and then defrosted when the bakery is ready to use the grains in the baking process.

Both the breweries and the bakeries benefit from this arrangement. The brewery typically would have been paying a waste management company to haul their spent grains to landfill (typically costing about C\$150/tonne). By repurposing the spent grains to be used in food products, a business expense is turned into a new source of revenue.

1) Mussatto, S.I. 2014. “Brewer’s spent grain: a valuable feedstock for industrial applications: Brewer’s spent grain and its potential applications.”. *Journal of the Science of Food and Agriculture*. 94 (7): 1264–1275.

2) These calculations can be found at <https://spentgoods.ca/amount-of-spent-grains-produced-in-canada>.

Also, the brewery can now sell food products made from their spent grains to their customer base, extending their brand recognition. For the bakery, the spent grains are a differentiating product that attracts a brand-new demographic that significantly contributes to its bottom line. And the consumer is able to enjoy delicious food, while reducing carbon and supporting local jobs.

Setting the Scope

The scope of Spent Goods' work includes spent grains that would otherwise have gone to the destinations of landfill, animal feed, or land application (as fertilizer). It does not include any inedible parts, as all of the spent grains can be re-used as food products.

Spent Goods' partners in Toronto, Ontario, include [Henderson Brewing Company](#), which provides the spent barley grains, and [Drake Commissary](#), an artisanal bakery that upcycles the grains.

FLW Measurement Methods

Spent Goods uses **records** for their calculations tracking the amount of food loss and waste being prevented. By multiplying the amount of spent grain used in each loaf of bread by the total amount of loaves sold, the company is able to calculate the total amount of spent grain diverted from landfill. This allows Spent Goods to generate measurements that are highly accurate, as they are based on existing sales and inventory data, without requiring expensive weighing equipment.

For companies with less detailed records, other options for measurement exist. Similar companies could also use **proxy data** to calculate their amount of spent grain. For beer, every gallon brewed generates about 1.7 pounds of wet spent grains.³ Therefore, a brewery lacking the capability to measure the weight of spent grains directly could generate an estimate (in pounds) by multiplying the number of gallons brewed by 1.7.

“People now have an ability to do something from a climate change or environmental perspective because of these products that we’re creating. What we’re doing is we’re redirecting things that are considered waste away from landfill.”
- Dihan Chandra, founder, The Spent Goods Company

3) Lynch, K.M., E.J. Steffen, and E.K. Arendt. 2016. “Brewers’ spent grain: a review with an emphasis on food and health.” *Journal of The Institute of Brewing*. 122 (4): 553-568.

4) For more information on converting food loss and waste weight to environmental, social and economic impacts, see the “Selecting Key Performance Indicators and Identifying Impacts” section of *How and Why to Measure Food Loss and Waste: A Practical Guide – Version 2.0*, accessible at <http://www3.cec.org/islandora/en/item/11814-why-and-how-measure-food-loss-and-waste-practical-guide>.

5) More information on these efforts can be found at <https://spentgoods.ca/our-mission/>

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Image 1: Products produced by Spent Goods are sold at more than 20 local businesses, including grocery stores and farmers' markets.

Results

From its founding in 2018 until September 2020, Spent Goods has prevented 1600 kg of spent grains from being sent to landfill, which has also prevented an associated 1.8 tons of CO₂e (carbon dioxide equivalent) in greenhouse gases. The new income streams associated with the work of the company have also supported more than twenty local businesses and generated revenue that can support the equivalent of 9.5 full-time jobs.⁴

Outcomes and Future Plans

Going forward, Spent Goods hopes to work with new partners to scale up their activities and expand the amounts of spent grains that are repurposed for new food products. Spent Goods founder Dihan Chandra also believes that the company's business model could easily be replicated in other locations outside of Toronto. Spent Goods is also exploring how to use spent grains (as well as coffee grounds) in other non-food products, such as corrugated cardboard and building insulation.⁵