

Bimbo Canada

Integrated Food Loss & Waste Assessment at Bakeries - How Bimbo Canada saves a lot of dough at its production facilities

Food Loss and Waste Measurement Case Study

Bimbo Canada is pursuing an integrated water, energy, and produce conservation strategy across 10 of its facilities. To date, these assessments have identified measures to reduce food loss by 1,500 tonnes/year, which will also save 2,200 tonnes/year of embedded GHG and 5.5 million meal equivalents per year.

Organization

Bimbo Canada is a proud member of Grupo Bimbo, which operates in 32 countries around the world. Bimbo Canada has 16 bakeries, 15 distribution centres and is the largest producer and distributor of packaged fresh bread and bakery products, with brands such as *Dempster's*®, *Villaggio*®, *POM*®, *Bon Matin*®, *Ben's*®, *McGavins*®, *Vachon*®, *Stonemill*®, *Sanissimo*, and *Takis*. In business for more than 100 years, the company employs more than 4,000 associates and had sales of nearly \$1.3 billion (2020).

Bimbo Canada is an organization committed to being a sustainable, highly productive and deeply humane company, while nourishing the world with delicious baked goods and snacks. The company is launching its new 2030 sustainability strategy in early 2021, with a focus on eight key areas: *Net Zero Emissions*, *Regenerative Agriculture*, *Towards Zero Waste*, *Caring for our People*, *Strengthening our Communities*, *Enabling Plant-Based Diets*, *Best Nutritional Profile* and *Transparent Sustainable Brands*.

Introduction

Bimbo Bakeries USA (also part of the Grupo Bimbo family) has corporately committed to Champions 12.3's [10x20x30](#) challenge (that commits to reducing food loss by 50% by 2030). Bimbo Canada shares this commitment and is targeting a 50% reduction in food waste by 2025. Bimbo Canada's integrated food loss, water and energy

What was measured?

Integrated utility conservation assessments were conducted at 10 Bimbo Canada (Bimbo) facilities, eight of which included food loss and waste (FLW) prevention. The assessment teams measured FLW related to the facilities' baking processes, including mixing, baking, and packaging.

How was it measured?

Most of the identified food losses were quantified at the process level using direct measurement techniques.

Annual estimated savings and payback periods were then calculated, based on operating hours, procedures, and potential avoidable losses.

What were the outcomes?

The potential total FLW prevention opportunities will save 1,500 tonnes (3.3 million lbs.) of food per year, worth \$1.6 million/year, with an average payback of under one month.

The measures will also reduce (embedded) GHG losses by 2,200 tonnes/year and retain 5.5 million meals per year in the food supply chain (based on calories).

conservation assessments are designed to identify a practical affordable path to secure this objective as well as their other reduction targets; including a reduction of water of 29%, thermal energy by 31% and electricity by 12% by 2025).

Many of the Bimbo Canada facilities already had good metrics on waste quantities generated, but the financial value assigned to the waste was generally based on disposal costs. And, in some cases, they were receiving a nominal revenue stream for the waste. However, by adding in the embedded ingredient and processing costs (up to the point of product loss), the economic driving force for loss prevention measures was found to be a hundred times larger than previously thought.

Understanding that the company did not have the internal expertise or the appropriate tools to adequately discover and measure FLW opportunities, Bimbo Canada retained Enviro-Stewards Inc. (Enviro-Stewards) to conduct integrated FLW prevention and utility conservation assessments at 10 of their facilities for 2020. The food loss prevention component for four of the facilities was completed by Enviro-Stewards, with co-funding from the (award-winning) national food loss prevention program administered by the Canadian Centre for Food Integrity (CCFI) and Provision Coalition, and the remainder were completed without co-funding. Due to provincial health regulations related to the pandemic, eight site assessments were complete to date, with all remaining facilities planned for 2021. Enviro-Stewards is an environmental engineering firm with extensive experience conducting food loss and waste prevention assessments in the industrial food and beverage processing sector.

Setting the Scope

The CEC's [guidance module for measuring FLW in processing and manufacturing](#) was employed at the Bimbo Canada facilities to measure food waste.

The production processes at the facilities are generally divided into four stages: mixing, proofing, baking, and packaging. During the mixing stage, ingredients such as flour, water, yeast, etc., are combined to create the product doughs. The dough is used to form the various products, some of which are left to proof for a certain amount of time to allow the yeast to ferment. Additional ingredients, such as sesame seeds or other toppings, might be sprinkled onto products prior to baking. The products are then baked, cooled, and packaged for distribution. The FLW project team (composed of Bimbo Canada and Enviro-Stewards staff) conducted the on-site phase of the assessment. The first step was to conduct detailed site walks of the production portions of the facilities to observe the various processes, discuss procedures with operations staff, and note points of food loss during production, changeovers, sanitation, and other activities. Once the major food loss sources were identified, the team then measured the losses to quantify them.

The next step of this first phase was to analyze the collected data to estimate annual losses (weight and dollar amount). Opportunities to reduce or eliminate the FLW sources were then identified, using root cause analysis, and quantification of the potential reduction associated with each opportunity. These findings were discussed with the facility team to vet the technical feasibility of the recommended measures, which ultimately produced a list of technically viable FLW reduction opportunities and associated quantity reductions. The installed capital cost and operating costs of the vetted measures were then calculated to estimate the net dollar savings, cost to implement, and payback period. The results of the assessment, including the list of FLW reductions and associated economic analysis, were presented in an assessment report. The executive summary

table in the report also provides the facilities with an implementation action plan. Once implemented, the modified processes and procedures can be remeasured to verify the savings secured and identify other potential FLW reduction opportunities.

FLW Measurement Methods

The following key measurement methods were used during the facility FLW assessments.

Direct measurement

- Lost food, such as food that had fallen on the floor or food waste generated through cleaning procedures, was collected by the project team and weighed on scales.
- The collected weights were further categorized by waste type, sampling time, and the location and/or process.

Waste Composition Analysis

- Waste collection receptacles were investigated to identify and measure (using weigh scales) any food waste that was discarded into the receptacles.
- The food waste data was categorized by location, sampling time, type of waste, and location/process.

Records

- Records of production, procedures, operating hours, etc., were used to estimate annual waste quantities, based on the collected and weighed food loss quantities from direct measurement and waste composition analysis.
- Historic waste records were also used to compare against the FLW estimates from the on-site measurements to verify the project findings.

Where possible, measurements were taken at-source as the process was operating and the waste was being generated. For example, at one particular facility, it was noticed that product was falling to the floor due to the arrangement of a conveyor system, receptacles were placed where the product was falling off and collected for a given period (such as one hour) or for one production shift. This method was selected as it would ensure accurate data.

Conversations with operators validated that the waste volume captured was typical (i.e., not an anomalous one-time event). Production run times were then used to extrapolate the measurements to annual quantities. For example, at one facility, food loss (out-of-specification bagels) at a divider was collected for a period of two hours (see Figure 1). These rejected bagels were categorized and sorted based on which categories could potentially be recovered/prevented at the divider. Several opportunities were identified to recover/prevent this waste.



Figure 1 - Bagels collected over a 2-hour period at divider

From a waste disposal cost perspective, this facility was actually credited for this waste source by its waste hauler (i.e., it was a source of revenue). However, when calculating the true cost of the food waste (embedded ingredient value), even with the loss of the waste credits the net annual savings were estimated to be \$122,900/year for this opportunity when extrapolated to an annual basis.

Similarly, at another Bimbo Canada facility, waste records were used to quantify the amount of unsaleable bread (caused by proofing, baking, or packaging issues) that was diverted to animal feed. Using the Commission for Environmental Cooperation's (CEC's) Food Recovery Hierarchy, prevention/source reduction is the most preferred option compared with animal feed. Hence, an opportunity to reduce this waste at-source was recommended by the assessment team, which could generate a monetary savings of nearly \$790,000/year at this one facility alone.

Results

The assessments conducted at the Bimbo Canada facilities identified 32 FLW prevention opportunities. Cumulatively, the identified opportunities will save 1,500 tonnes (3.3 million lbs) of food per year, which equates to a savings of

\$1.6 million/year with a payback of less than one month. The measures will also avoid the loss of 2,200 tonnes/year of embedded greenhouse gas emissions (as carbon dioxide equivalents) and 5.5 million meals per year saved (based on equivalent calories).

Outcomes

Bimbo Canada has begun implementing the utility conservation and FLW opportunities identified during the facility assessments. For example, opportunities associated with air compressor system efficiency and water conservation have already been implemented. On the FLW prevention side, conveyance and packaging systems have already been modified per the assessment recommendations to decrease final product loss.

The company is also using the data from the assessment reports to build roadmaps per facility and in capital expenditure planning to prioritize where and when to invest in the identified utility and FLW prevention opportunities at each facility. At the facility level, each assessment report includes an implementation action plan that the facility team can use to schedule implementation activities and measure and track savings. Additionally, internal case studies have been developed with Enviro-Stewards and used by facilities to highlight implemented projects, which are effective communication tools to document success and motivate facility staff to maintain momentum in their implementation efforts.

The shared commitment between Bimbo Canada and its individual facilities regarding FLW prevention and reducing utility spending will help ensure that the measures are implemented, and the savings realized. The benefits the implemented measures will provide to Grupo Bimbo include: more profit due to higher yields, competitive facilities that provide job stability, reduced environmental footprint, and providing a societal good by reducing food waste and loss.

“The CEC guide was useful in helping us to determine our scope, ask the right questions along the way and, most importantly, educate our associates about why we need to look at our food loss differently and the value of preventing it at the source.”

***- Teresa Schoonings, Senior Director,
Government Relations & Sustainability***

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