



Building a Business Case for Food Loss + Waste Reduction

Meena Hassanali

May 5, 2017

**PROVISION
COALITION**

PROCESSING FOOD SUSTAINABLY

The background of the slide is a collage of various food items. On the left, there are green pears. In the center, there are several mushrooms on a metal tray. On the right, there are trays of bread rolls and a container of red cherry tomatoes. The overall theme is fresh, healthy food.

Outline

- About Provision Coalition
- Provision's FLW Initiatives
 - FLW Toolkit
- Real World Case Study
 - Campbell Company of Canada
- Next Steps

PROVISION COALITION

ALERTA
food processors association

*Baking Association
of Canada*
*Association canadienne
de la boulangerie*

**Canadian
Beverage
Association**

**Canadian
National
Millers
Association**

CO PA

CTAQ

CONSEIL DE LA
TRANSFORMATION
ALIMENTAIRE
DU QUÉBEC
FOOD PROCESSING
COUNCIL
OF QUÉBEC

**FOOD AND
BEVERAGE
ONTARIO**

FCPC
Food & Consumer
Products of Canada

PACC
Produits alimentaires et de
consommation du Canada

**ONTARIO AGRI BUSINESS
ASSOCIATION**

**ONTARIO
OCB
CRAFT BREWERS**

ODC
Ontario Dairy Council

OCFA
Ontario Commercial Fisheries' Association

OFVPA The Ontario
Fruit & Vegetable
Processors Association

**WINE COUNCIL
OF ONTARIO**

About Provision Coalition

- Delivering expert resources & programs to make food sustainably
 - Sustainable Management System & Support
 - Value Chain Collaboration
 - Knowledge Transfer & Outreach



How Big is Food Waste Problem in Canada?

\$31 BILLION/Year

30 - 40% of
food produced
is lost along
the value
chain

2% of
Canada's GDP

70% of
Canada's agri-
food exports

Why Does It Matter?



Reducing food loss and waste (FLW) is an opportunity with social, economic, and environmental benefits:

- ✓ Improve food security for a growing population
- ✓ Feed hungry people now
- ✓ Increase efficiency and avoid unnecessary costs
- ✓ Improve nutrition and save consumers money
- ✓ Conserve and protect natural resources
- ✓ Contribute to reducing climate change



Food Loss + Waste & Climate Change

- If FLW was its own country it would be **THIRD LARGEST** emitter
 - After China and USA
- Each tonne of food waste emits 1.9 tonnes eCO₂ across the food supply chain
 - European Commission, 2011

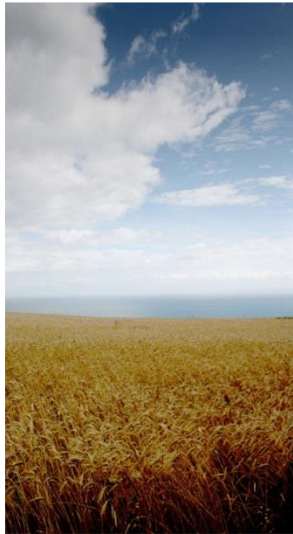
Source: World Resources Institute



Food is Lost or Wasted Along the Entire Value Chain

Production

During or immediately after harvesting on the farm



Handling and Storage

After product leaves the farm for handling, storage, and transport



Processing and Packaging

During industrial or domestic handling, storage, and transport



Distribution and Market

During distribution to markets, including losses at wholesale and retail markets



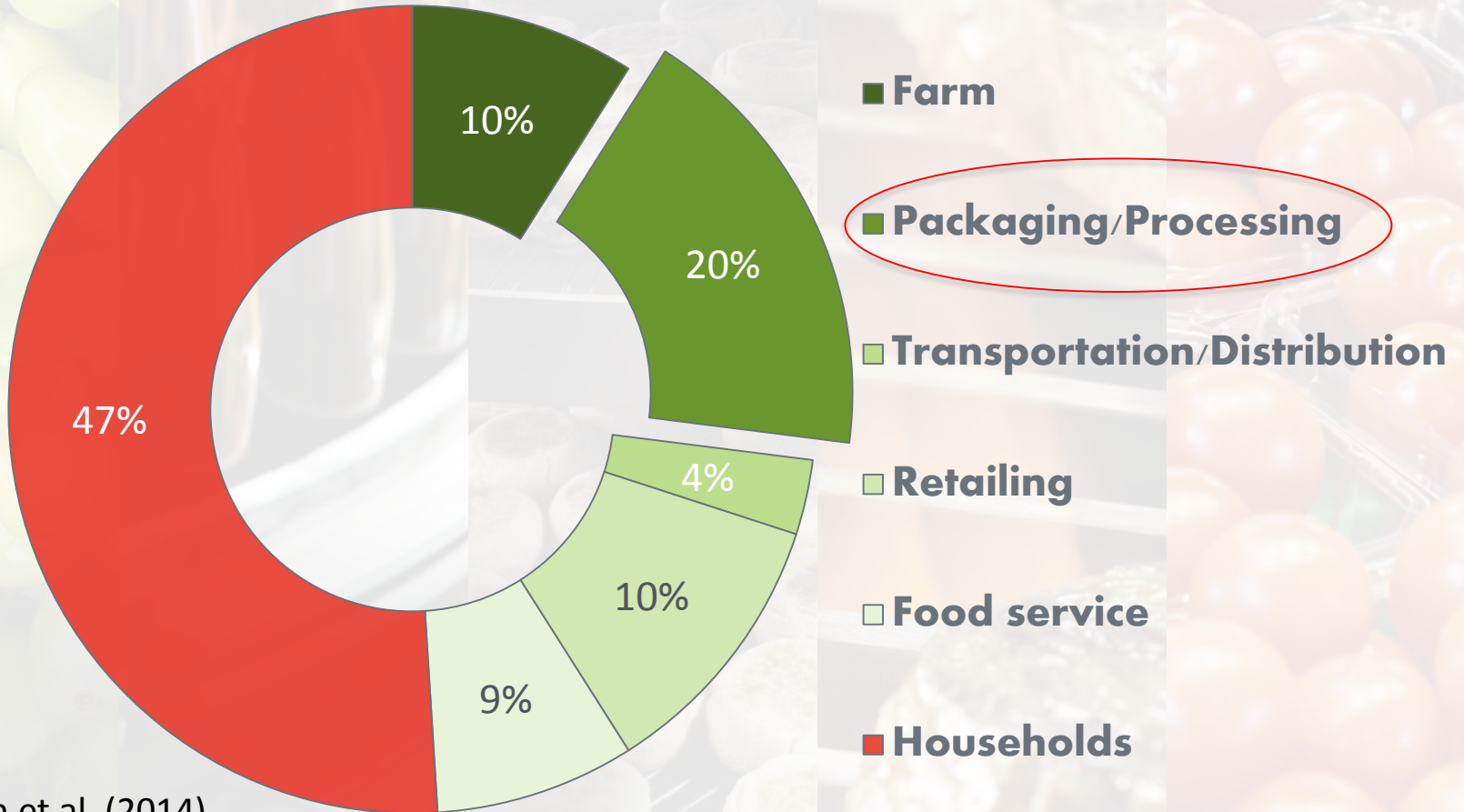
Consumption

Losses in the home or business of the consumer, including restaurants and caterers



Source: WRI analysis based on FAO. 2011. *Global food losses and food waste – extent, causes and prevention*. Rome: UN FAO.

Distribution of Food Waste Throughout the Value Chain (Farm to Fork)



Source: Gooch et al. (2014)



FLW Challenges and Opportunities

- Awareness of a problem
 - \$6 Billion waste occurring from manufacturing in Canada
- Access to innovative solutions
 - Technology; beneficial practices
- Ability to quantify and track progress
 - No data
- Mindset shift
 - Managing change

Provision's Food Waste Stakeholders Collaborative



Enviro-Stewards
Engineers & Scientists



Fread & Associates
Ltd.





Provision's FLW Toolkit

**PROVISION
COALITION**

PROCESSING FOOD SUSTAINABLY

Global Recognition

2017  **Clean50**
Outstanding Contributors to Clean Capitalism
TOP 15 PROJECTS



environmental LEADER
PRODUCT & PROJECT
AWARDS

**TOP PROJECT
OF THE YEAR
2015**

“Every food and beverage manufacturer should be aware of (the SMS) and leverage it to save money and become better stewards of our environment.”

Stage 1a. Quantifying Food Waste - Input Screen

Method 1. Quantifying Avoidable Food Waste Using Available Waste Disposal and Diversion Data

1 Stage 1, Method 1 Qualifying Food Waste ▶ 2 Stage 1, Method 1 Output ●

Input Data from Bills

< BACK TO OVERVIEW

How many tonnes of waste was directed to landfill? From your bills or waste audit data enter the number of months they represent and tonnes of waste.

Months	Tonnes	Annual
<input type="text" value="7"/>	<input type="text" value="100"/>	171.4 tonnes/year

What was the cost of landfilling during the same period? From your bills or waste audit data enter the number of months they represent and disposal cost of waste.

<input type="text" value="7"/>	<input type="text" value="5000"/>	\$8571 /year
--------------------------------	-----------------------------------	--------------

What per-cent of the waste directed to landfill is food waste ? Estimate using your best judgment. (default 50%)

<input type="text" value="35"/>	60 tonnes/year
---------------------------------	-----------------------

How many tonnes of food waste was diverted to any non-disposal options (e.g. composting, anaerobic digestion, animal feed)? From your bills or waste audit data enter the number of months they represent and tonnes of food waste.

Months	Tonnes	Annual
<input type="text" value="12"/>	<input type="text" value="10"/>	10.0 tonnes/year

What was the cost of diversion during the same period? From your bills or waste audit data enter the number of months they represent and diversion cost of waste.

<input type="text" value="12"/>	<input type="text" value="100"/>	\$100 /year
---------------------------------	----------------------------------	-------------

Total Annual Tonnes of Food Waste

Total Annual Cost to Manage Food Waste (Disposal and Diversion)

70 tonnes/year
\$3100 /year

Stage 1b

Stage 1b Method 1. Quantifying Food Waste -Output Screen



Output with Data from Bills

[< BACK TO OVERVIEW](#)

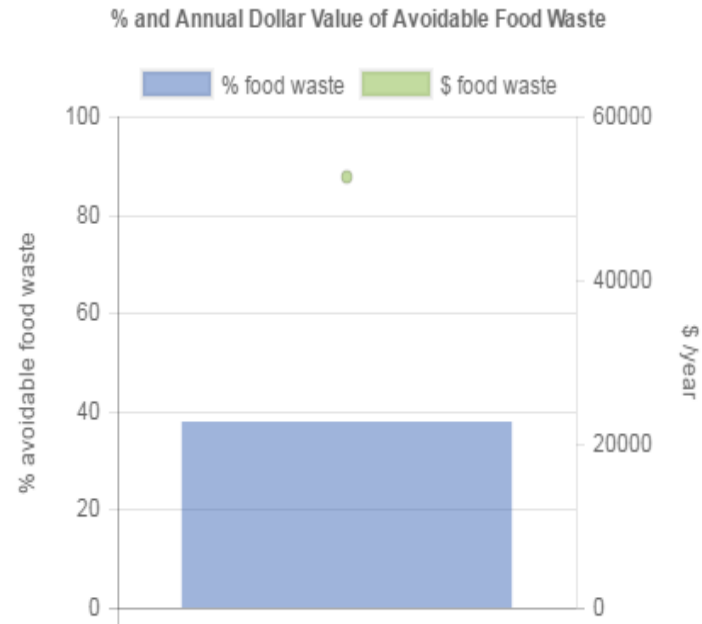
Quantity of Food Waste Report

Annual Quantity of Food Waste	70	tonnes/yr
Estimated % Avoidable Food Waste in Waste Stream	39	%
Disposal Cost	\$3,100	\$/yr
Diversion Cost	\$44	\$/tonne
Average value of finished product	\$1.00	\$/kg
Average value of ingredient mixture	\$0.50	\$/kg
Operating days per year	250	days
Value of Food Waste (i.e. Product) Lost	\$52,500.00	(\$/yr)

This gives you a rough estimate of the amount and dollar value of food waste generated at your facility.

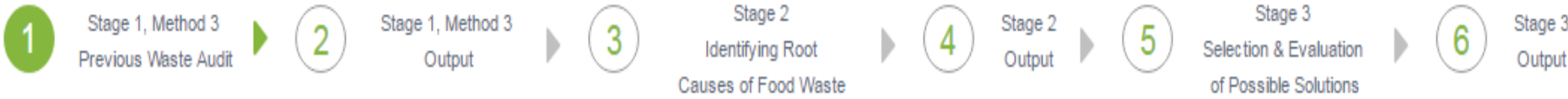
If you want to develop a more refined estimate we suggest that you undertake a food waste audit.

[GO TO FOOD WASTE AUDIT](#)



Method 3 - Stage 1a

Input Audit Data



< BACK TO OVERVIEW

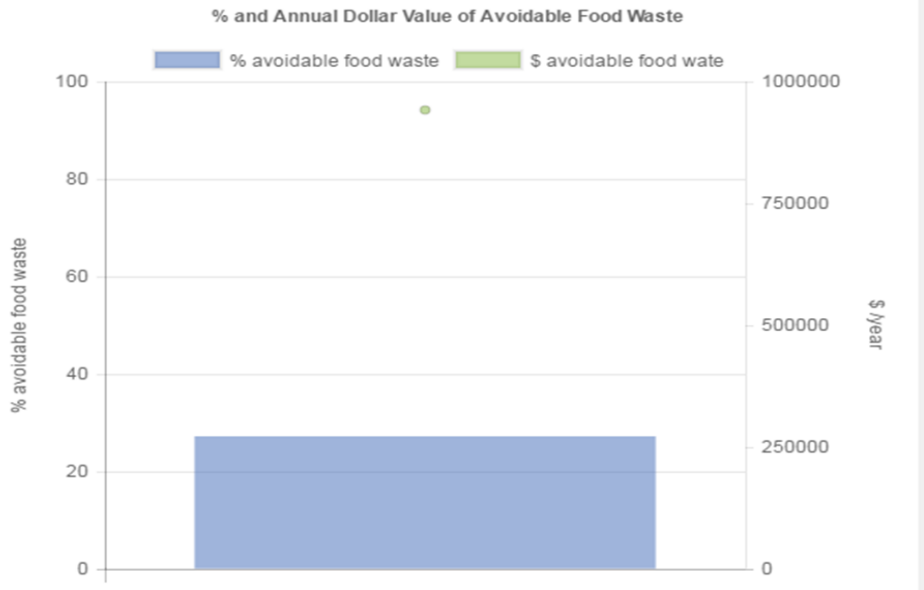
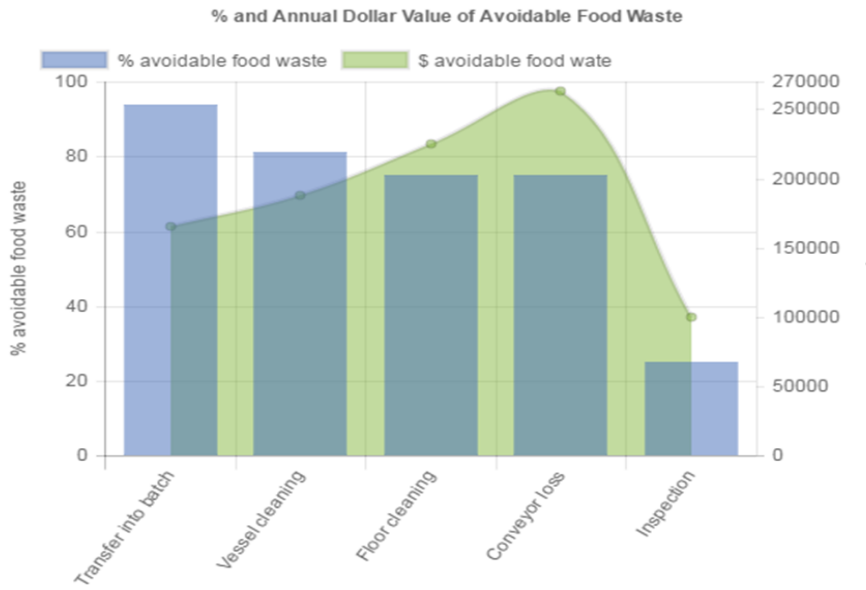
<p>List up to five significant processes/procedures that generate avoidable food waste.</p>	<p>Estimate the per-cent of cumulative processing completed at each processing step. If you don't know 100% is assumed to be "Other"</p>	<p>How many days of food waste did your food waste audit measure?</p>	<p>What is the weight (kg) of avoidable food waste per process/procedure measured during your food waste audit?</p>	<p>What is the weight (kg) of unavoidable food waste per process/procedure measured during your food waste audit?</p>
---	---	---	---	---

Step 1	Transfer into batch	10	1	300	75
Step 2	Vessel cleaning	25	1	300	25
Step 3	Floor cleaning	50	1	300	0
Step 4	Conveyor loss	75	1	300	0
Step 5	Inspection	100	1	100	0

Other

Output with Audit Data

	Step 1	Step 2	Step 3	Step 4	Step 5	Total
Description of process	Transfer into batch	Vessel cleaning	Floor cleaning	Conveyor loss	Inspection	
% of processing completed	10 %	25 %	50 %	75 %	100 %	
Days of food waste measured by food waste audit?	1.0	1.0	1.0	1.0	1.0	
Weight (kg) of avoidable food waste per process/procedure.	300	300	300	300	100	1300
Weight (kg) of unavoidable food waste per process/procedure.	75	25	0	0	0	100
% of potentially avoidable food waste	21	21	21	21	7	93
Annual Quantity Avoidable Food Waste Lost (tonnes/yr)	75	75	75	75	25	325
Total food waste. (tonnes)	94	81	75	75	25	350
Disposal and Diversion cost of avoidable food waste (\$/yr)	\$219	\$219	\$219	\$219	\$73	\$948
Product value (\$/kg)	\$0.55	\$0.63	\$0.75	\$0.88	\$1.00	
Value of Affordable Food Waste (i.e. Product) Lost (\$/yr)	\$165,000	\$187,500	\$225,000	\$262,500	\$100,000	\$940,000
Subtotal of avoidable Food Waste Cost/Opportunity (\$/yr)	\$165,219	\$187,719	\$225,219	\$262,719	\$100,073	\$940,948



Root Cause Identification

You have identified steps along the process where food is wasted which is presented here. You can select from one up to all of the process steps to complete the 5 Whys on. See examples of potential root causes in the right column of this page.

You may have to ask "Why" once or all five times until the root cause is identified. As well, there may be only one root cause but if more, you can select up to three root causes per process step.

Before you start, we encourage you to speak with different departments within your organization to help identify root causes. To assist you with identifying potential root causes, refer to the side bar.

Process Step 1 - Root Cause Identification

Ingredient Recipe

Why 1

Why did food waste occur?

Container required is larger than measurement needed, extra cannot be used.

Why 2

Why did answer 1 happen?

Why 3

Why did answer 2 happen?

Why 4

Why did answer 3 happen?

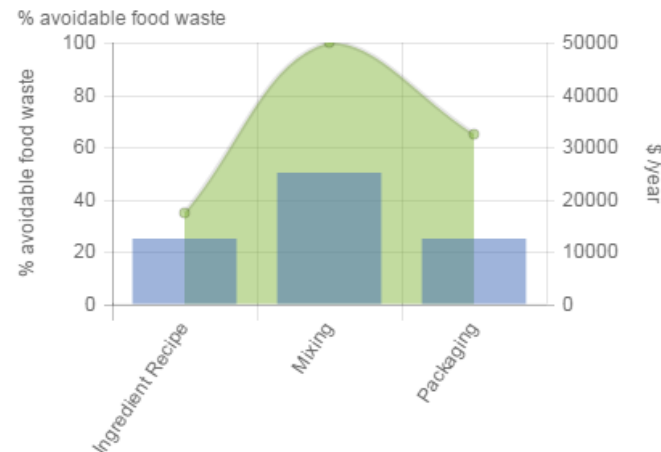
Why 5

Why did answer 4 happen?

Root Cause(s)

<input type="text" value="Food safety issues"/>	or select	<input type="text" value="--Select--"/>	<input type="button" value="v"/>
<input type="text"/>	or select	<input type="text" value="--Select--"/>	<input type="button" value="v"/>
<input type="text"/>	or select	<input type="text" value="--Select--"/>	<input type="button" value="v"/>

% and Annual Dollar Value of Avoidable Food Waste



View potential root causes for food/beverage waste in processing and packaging [▶](#)



Evaluating Solutions

View potential solutions to root causes of food waste ▶

Process Step 1

Ingredient Recipe

Root Cause(s)	Possible Solution(s)	Estimated Capital Budget	Estimated Operating Annual Budget	What are the potential benefits to this solution?	What are the potential challenges to this solution?	When can this solution be implemented?			Importance
Step 1 Food safety issues	Refrigeration closer to	5000.00	0.00	Reduced ingredients	Space and budget	Short-term 0-1 years <input checked="" type="radio"/>	Mid-term 1-5 years <input type="radio"/>	Long-term > 5 years <input type="radio"/>	Medium ▼

Process Step 2

Mixing

Root Cause(s)	Possible Solution(s)	Estimated Capital Budget	Estimated Operating Annual Budget	What are the potential benefits to this solution?	What are the potential challenges to this solution?	When can this solution be implemented?			Importance
Step 2 Poor machine set up	Training on equipment	0.00	3000.00	Better training on equipment	Staff turnover and training	Short-term 0-1 years <input checked="" type="radio"/>	Mid-term 1-5 years <input type="radio"/>	Long-term > 5 years <input type="radio"/>	High ▼

Process Step 3

Packaging

Root Cause(s)	Possible Solution(s)	Estimated Capital Budget	Estimated Operating Annual Budget	What are the potential benefits to this solution?	What are the potential challenges to this solution?	When can this solution be implemented?			Importance
Step 3 Poor machine set up	Change the operating	2000.00	4000.00	Reduce poor packaging	Orders will take longer	Short-term 0-1 years <input checked="" type="radio"/>	Mid-term 1-5 years <input type="radio"/>	Long-term > 5 years <input type="radio"/>	Low ▼

Solutions Report

Stage 3b. Selection and Evaluation of Possible Solutions - output screen



[< BACK TO OVERVIEW](#)

Summary of possible solutions to root cause issues of food waste that can be printed and distributed for discussion to help with developing the implementation plan.

Possible Solutions Report

Process Step No.	Process Description	Root Cause Description	Possible Solution(s)	Estimated	Estimated	Short Term 0-1 Yr	Mid Term 1-5 Yr	Long Term >5 Yr	Importance
				Capital Budget	Annual Operating Budget				
2	Mixing	Poor machine set up	Training on equipment	0.00	3000.00	X			High
3	Packaging	Poor machine set up	Change the operating speed of the packaging machinery	2000.00	4000.00	X			Low
1	Ingredient Recipe	Food safety issues	Refrigeration closer to work area	5000.00	0.00	X			Medium

BACK

NEXT

Food Waste Reduction and Practices Toolkit

To start using the framework simply select the question that represents the stage your company is at.

Pilot Partners











**BYBLOS
BAKERY**
A World of Taste



99% of Sites Had a Positive Return on Their Investment

COMPANIES



- | | |
|--|---|
| Measuring waste  |  Selling imperfect produce |
| Training staff  |  Creating new products |
| Improving inventory management  |  Reducing waste management costs |
| Changing packaging  |  Avoiding cost of food not sold |



FLW Toolkit: Real World Case Study

**PROVISION
COALITION**

PROCESSING FOOD SUSTAINABLY

Campbell's®



- ❖ FLW Commitment: Reduce food waste to landfill in manufacturing operations by 50% by 2025
 - ❖ 3/4 of fresh ingredients used are within 3 hour drive of plant
 - ❖ Ugly vegetables make beautiful soup
- ❖ Conventional 3Rs Waste Audit
 - ❖ Touched on 1% of Campbell's food waste
 - ❖ Retained third party consultant Enviro-Stewards to conduct comprehensive food waste prevention assessment
 - ❖ Applied food loss + waste toolkit



FLW Toolkit & Assessment Found...

- **Six** food waste reduction opportunities
- Increase yield at plant **938 tonnes/yr**
- Valued at **\$706,000 annually**
- Net payback: less than **6 months**

Campbell's®



Enviro-Stewards
Engineers & Scientists



Campbell Company of Canada

“This has been a rewarding process for the team at Campbell Canada in Toronto. We have been committed to Provision’s food loss + waste reduction challenge for some time and now we have successfully applied the recently developed Toolkit in our own facility. Food loss + waste has a direct impact on food insecurity - 1 in 8 Canadian families struggle to put food on the table - with 20% of waste occurring at the manufacturing level we have an important role to play. Provision’s Food Loss + Waste Reduction Toolkit is available to manufacturers across the country, this is a milestone achievement for the industry.”

John Lillard, Research & Development, Campbell Company of Canada

Implementing identified food waste reduction measures, with a net payback period of less than 6 months, could increase the yield of Campbell Canada’s Toronto facility by 938 tonnes per year valued at \$706,000.



Summary & Next Steps

- FLW Toolkit Version 2.0 planned:
 - Alignment to FLW protocol
 - Ability to work with more than 5 processes
 - ROI calculations
 - Inclusion of energy, water & carbon calculations
- Expanding reach with FLW Toolkit
 - Workshops on how to use toolkit; funding incentives
 - More pilots & case studies



MEENA HASSANALI B.Sc., M.E.S.
Director, Industry Programs
mhassanali@provisioncoalition.com

**PROVISION
COALITION**

PROCESSING FOOD SUSTAINABLY

100 Stone Road W, Suite 205
Guelph, Ontario N1G 5L3
P. 519-822-2042 x303
C. 416-587-5321
www.provisioncoalition.com

**PROVISION
COALITION**

PROCESSING FOOD SUSTAINABLY