



# Practical Approaches to Reducing FLW in Manufacturing

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Feb 28, 2017

**PROVISION  
COALITION**

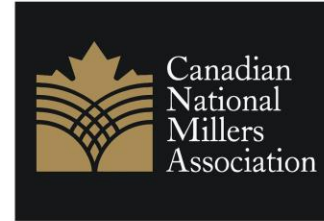
PROCESSING FOOD SUSTAINABLY



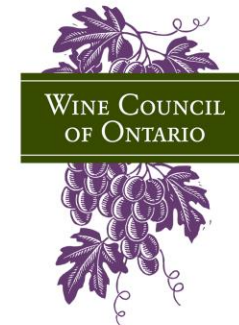
# Outline

- About Provision Coalition
- FLW Initiatives
  - FLW Challenges and Opportunities
- Practical Solutions
  - Approaches
- Summary & next steps

# PROVISION COALITION



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



# About Provision Coalition

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





# Provision's Food Loss + Waste Initiatives

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PROCESSING FOOD SUSTAINABLY

# ISSUES IN THE FOOD AND BEVERAGE INDUSTRY

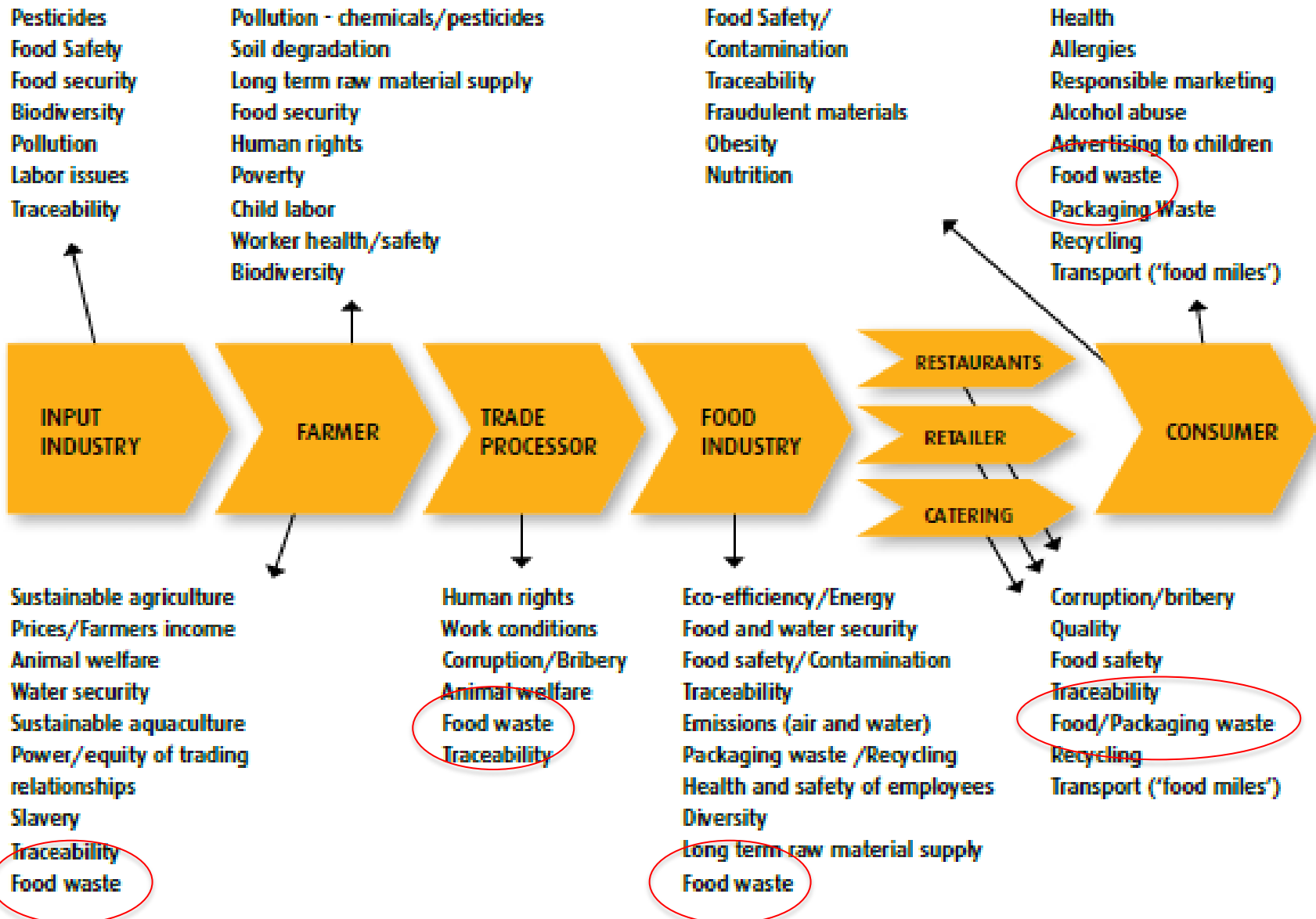


DIAGRAM 3: ISSUES IN THE FOOD AND BEVERAGE INDUSTRY

"Ionescu-Somers, A. and Steger, U. (2008) Business Logic for Sustainability: A Food and Beverage Industry Perspective, Palgrave Macmillan, UK, Page 39"

# Research: Mapping Food Waste Challenge

- Understand food waste in Canadian F&B industry
  - **What** is food waste?
  - **How** big is the food waste problem?
  - **Where** does food waste occur and **why**?
  - **How** can the problem be tackled?

Developing an  
Industry Led  
Approach to  
Addressing  
Food Waste  
in Canada

[View the full report](#)



Network for  
Business Sustainability

Business. Thinking. Ahead.



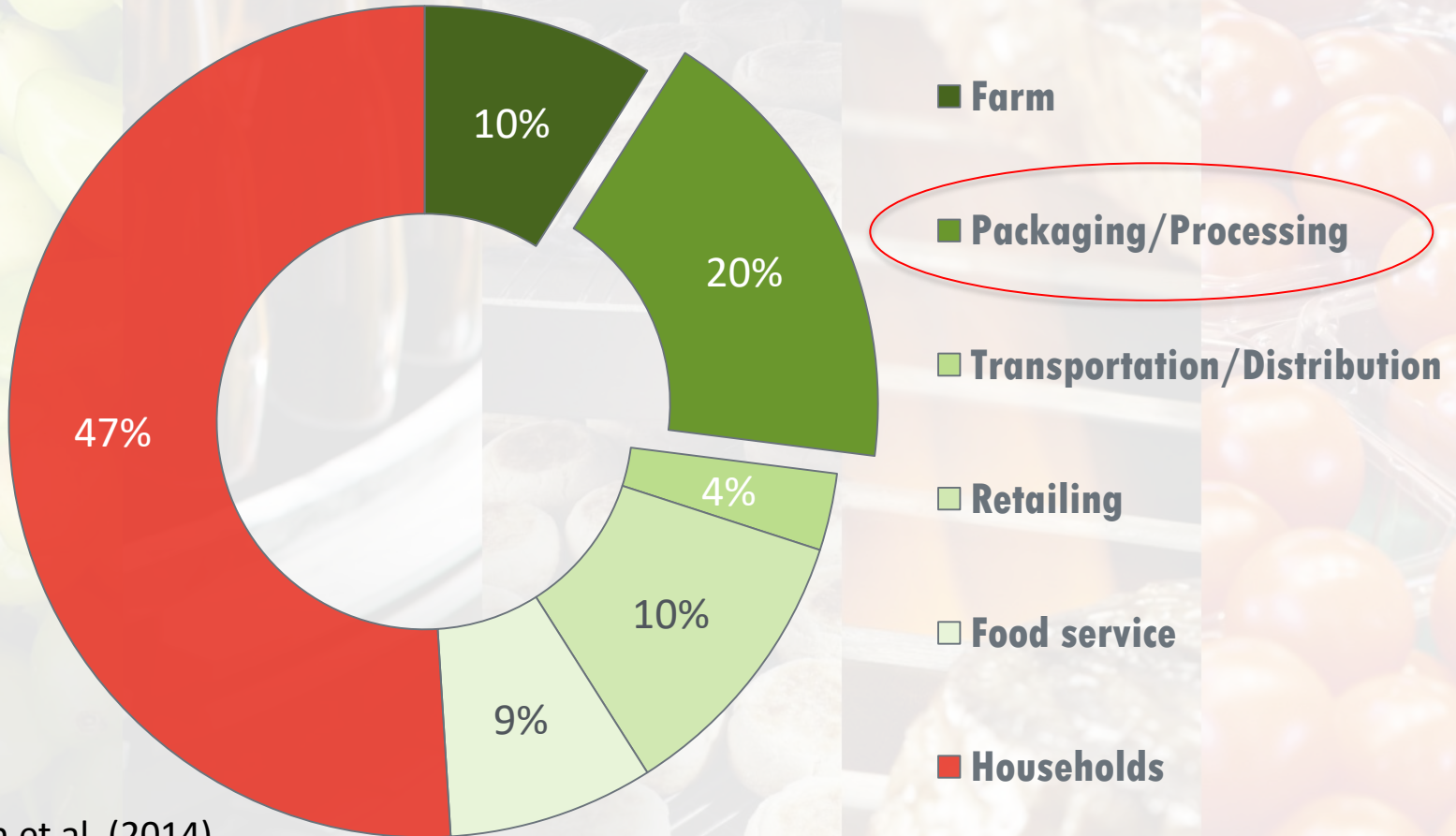
VM  
International



IVEY

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



Source: Gooch et al. (2014)



# What Are the Hot Spots for Food Waste?

Farm		Packaging & Processing	Wholesale Distribution	Retailing	Food Service	Households
Crop/ livestock production	Post-harvest					
Fruits & Veggies	Fruits & Veggies	Grain Products	Fruits & Veggies	Fruits & Veggies	N.A.	Fruits & Veggies
Seafood	Meat	Seafood	Seafood	Seafood		Meat & Seafood
	Grain Products	Meat	Meat	Meat		Grain Products
		Dairy Products		Bakery & Deli		Dairy Products
		Beverages		Ready-Made Food		Beverages



## What Are Root Causes of FLW?

- Human behaviour and incentives behind it
- Time-limited biological reality of food
- Limitations of technology or lack of advanced technology, equipment, packaging, etc.
- Risk perception and risk avoidance
- Unintended consequences of regulation



## Why is FLW Not a High Priority for All Businesses?

- Not aware of the extent of food waste
- Fail to connect the dots – tie food waste to costs and profitability
- Believe it is cheaper to dispose of food waste than to manage in a way that drives reduction, re-use or recycling
- Do not understand that change is possible



# FLW Challenges and Opportunities

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



**LEARNING**

**KNOWLEDGE**

INFORMATION INFORMATION INFORMATION

DATA DATA DATA DATA



# Solutions Focused Research

- Innovation & Technology Opportunities
- Industry Best Practices



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**CANADA'S 2017  
FOOD LOSS + WASTE FORUM**  
**Finding Solutions**

April 12, 2017 • Mississauga Convention Centre



- April 12, 2017
- Mississauga Convention Centre, Toronto
- Linking solutions to food waste reduction



# Food Waste Working Group



**INCREASE**  
**PROFITABILITY &  
COMPETITIVENESS**

**REDUCE**  
**ENVIRONMENTAL  
FOOTPRINT &  
BUSINESS RISKS**



# Practical Solutions

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PROCESSING FOOD SUSTAINABLY

# 2017 Clean50

Outstanding Contributors to Clean Capitalism

## TOP 15 PROJECTS



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PROCESSING FOOD SUSTAINABLY

Getting Started Tools Resources News & Events About Us

### Getting Started

To start using the framework simply select the question that represents the stage your company is at. If you are new to the framework click on "Where to you want to go?" to start the process.



### Sustainability Integration Framework

The focus of the framework is on overall sustainability performance for individual food and beverage manufacturing facilities. It is useful if you are just getting started, or if you are contemplating next steps. The framework is based on a Plan, Do, Check, Act cycle and consists of 5 main steps.

The cyclical nature of the framework reflects the continuity of the sustainability integration process. As you work your way through the elements, you will see a number of suggested activities – it's not expected or necessary to execute each one – users are encouraged to use the tools and resources throughout the portal to support efforts in meeting your business needs and vision.



*“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



# Input Data from Bills

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

<input type="text" value="35"/>	<b>60 tonnes/year</b>
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**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
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**Total Annual Tonnes of Food Waste**

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

<b>70 tonnes/year</b>
<b>\$3100 /year</b>

# Stage 1b

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



# Output with Data from Bills

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## 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
<b>Value of Food Waste (i.e. Product) Lost</b>	<b>\$52,500.00</b>	<b>(\$/yr)</b>

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

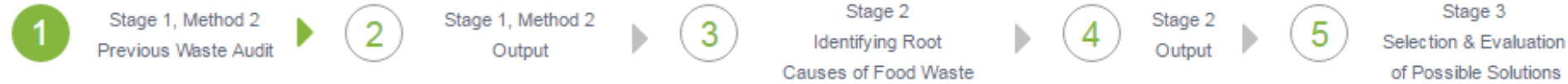
If you want to develop a more refined estimate we suggest that you undertake a food waste audit.

[GO TO FOOD WASTE AUDIT](#)

% and Annual Dollar Value of Avoidable Food Waste



# Method 2. Quantifying Avoidable Food Waste Using Waste Audit and Available Waste Disposal and Diversion Data



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## Input Audit Data

Tell us about your facility

List up to five significant processes/procedures that generate avoidable food waste.

Estimate the per-cent of cumulative processing completed at each processing step. If you don't know 100% is assumed to be "Other"

Estimate the % avoidable food waste generated along each processing step. Whatever % you don't know, will be assumed as "Other".

Step	Process	% Cumulative Processing Completed	% Avoidable Food Waste
Step 1	Ingredient Recipe	0	25
Step 2	Mixing	50	50
Step 3	Packaging	100	25
Step 4			
Other			0%

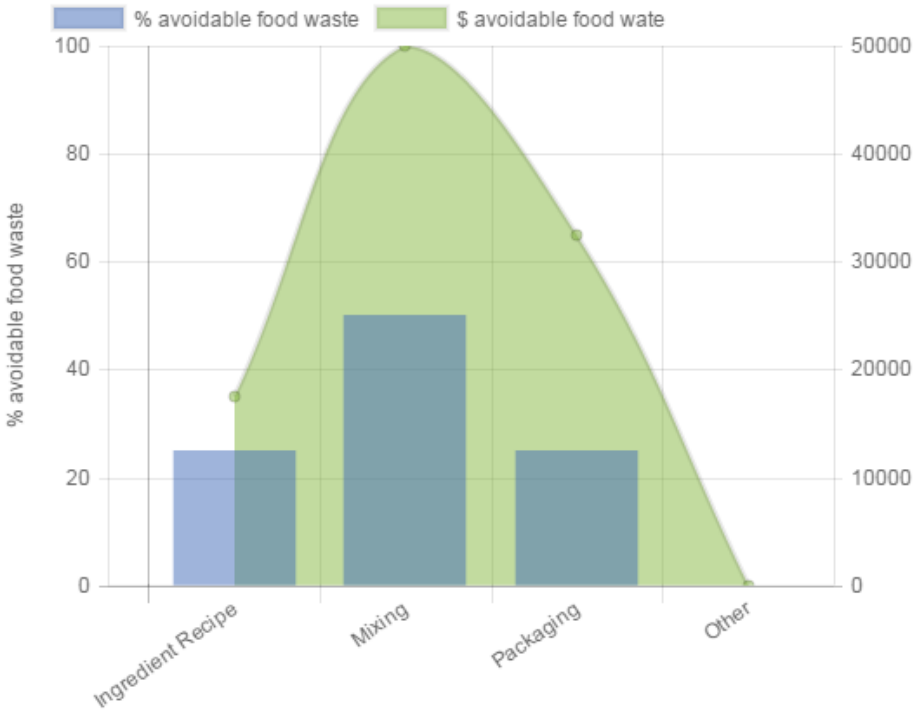
How many days does your facility operate per year?  
(default is 250 days)

% / Kg

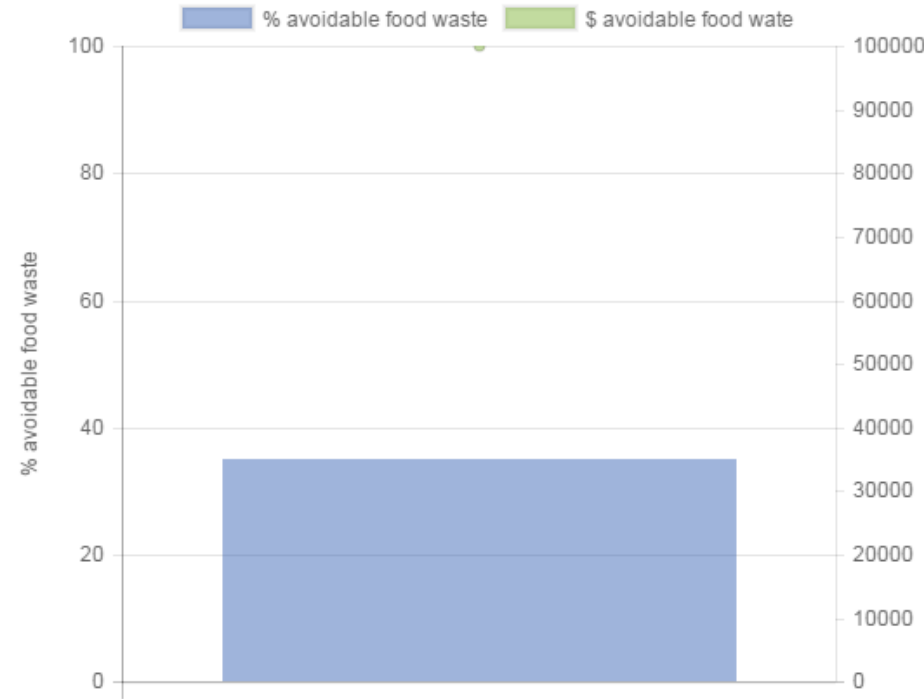
	Step 1	Step 2	Step 3	Other	Total	
Description of process	Ingredient Recipe	Mixing	Packaging	Other		
% of processing completed	0 %	50 %	100 %	0 %		
Estimate % of food waste generated along each processing Stage	25 %	50 %	25 %	0 %		
Potentially avoidable loss (kg/day)	60	120	60	0	240	
Annual Quantity Avoidable Food Waste Lost (tonnes/yr)	15.00	30.00	15.00	0.00	60	
Disposal and Diversion cost (\$/yr)	\$2,500	\$5,000	\$2,500	\$0	\$10,000	10 %
Product value (\$/kg)	\$1.00	\$1.50	\$2.00	\$1.00		
Value of Affordable Food Waste (i.e. Product) Lost (\$/yr)	\$15,000	\$45,000	\$30,000	\$0	\$90,000	90 %
<b>Subtotal of avoidable Food Waste Cost/Opportunity (\$/yr)</b>	<b>\$17,500</b>	<b>\$50,000</b>	<b>\$32,500</b>	<b>\$0</b>	<b>\$100,000</b>	<b>100 %</b>

# Output with Audit Data

% and Annual Dollar Value of Avoidable Food Waste



% and Annual Dollar Value of Avoidable Food Waste



# 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?

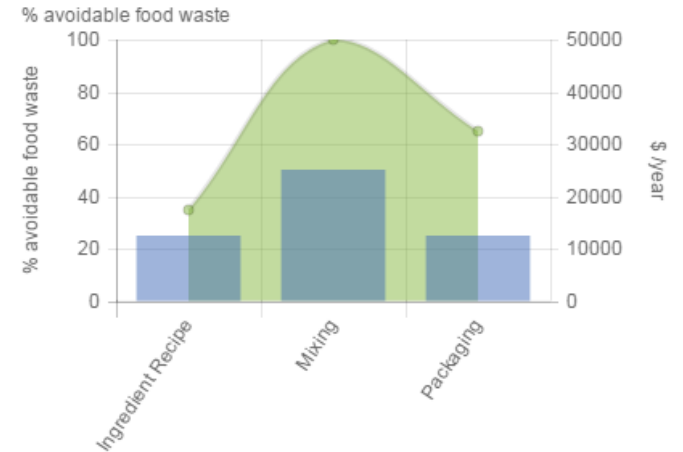
#### Why 5

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



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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 Capital Budget	Estimated Annual Operating Budget	Estimated			Importance
						Short Term 0-1 Yr	Mid Term 1-5 Yr	Long Term >5 Yr	
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

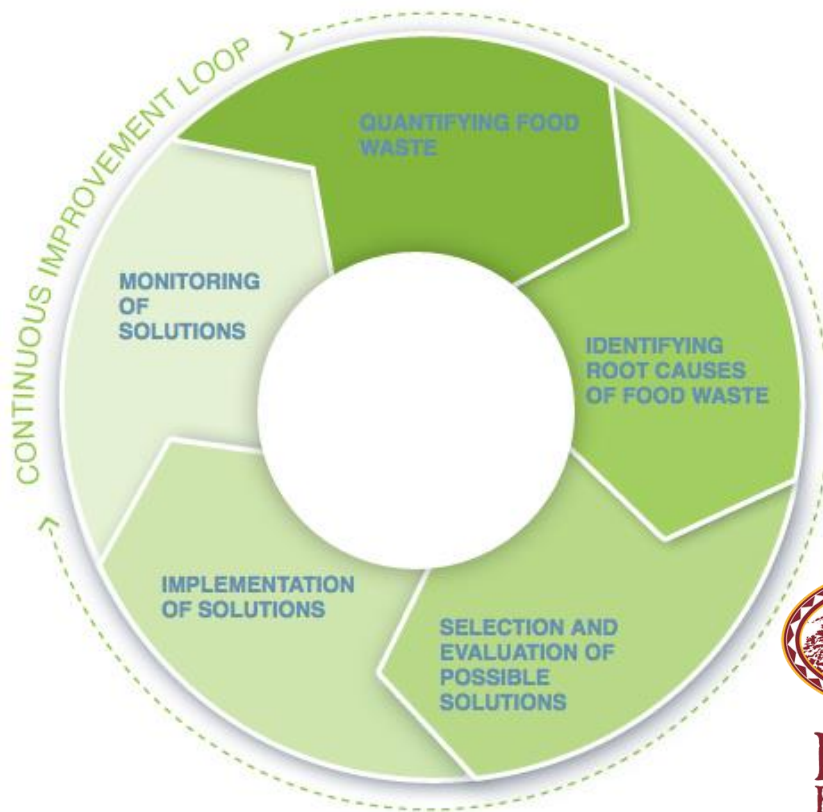
BACK

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





## FLW Toolkit – Version 2.0

- Version 2.0 planned to include:
  - Summary report download
  - Ability to work with more than 5 processes
  - ROI calculations
  - Inclusion energy, water & carbon calculations

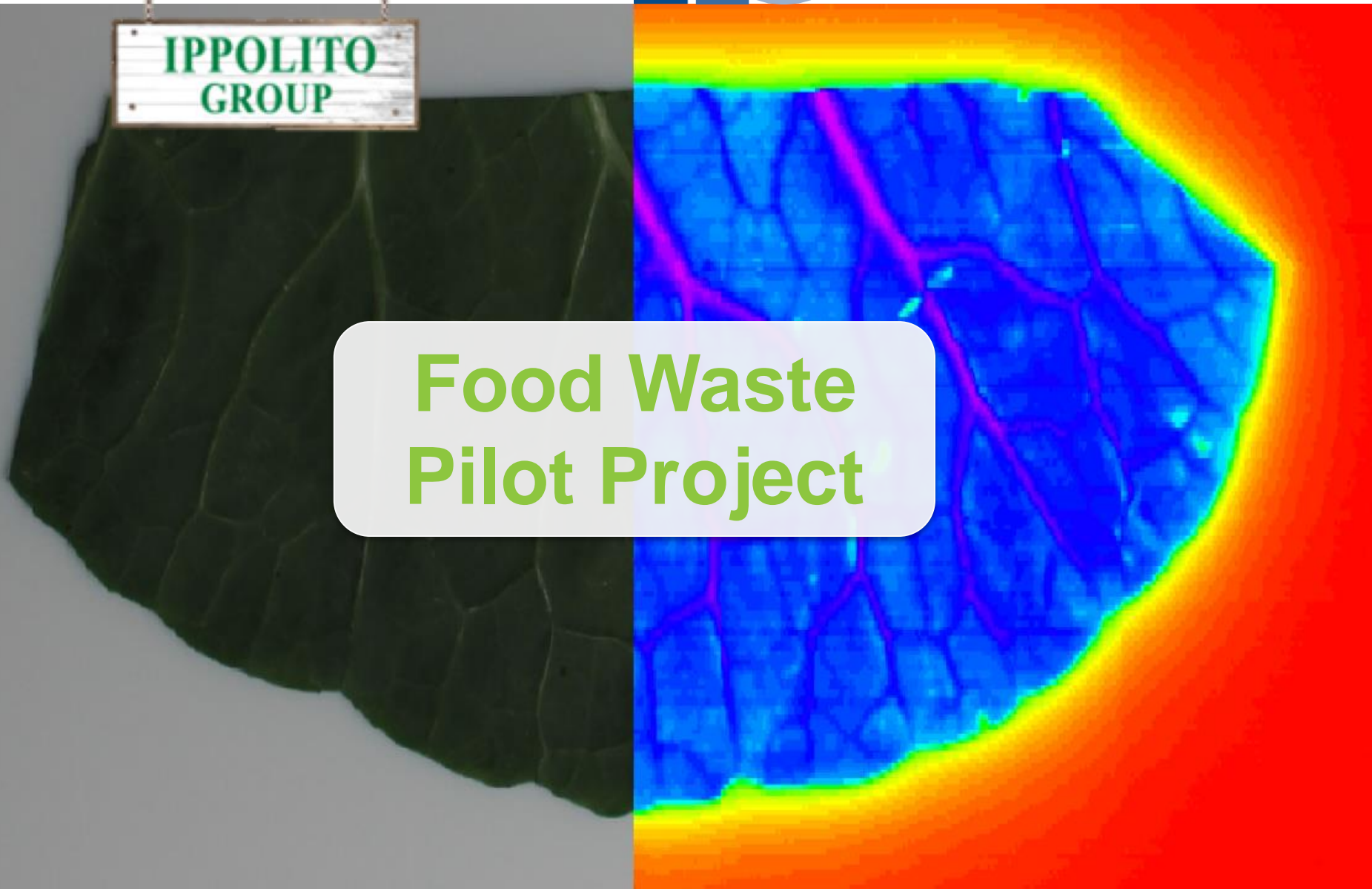


IPPOLITO  
GROUP



P&P Optica  
Do More with Chemical Imaging

# Food Waste Pilot Project





## Summary & Next Steps

- Enhancing toolkit
  - Quantification of reductions over time
    - Linking innovation to results
  - Ability to aggregate industry results to demonstrate progress
- Expanding reach with FLW Toolkit
  - Workshops on how to use toolkit
- R&D for Mindset Shift Tool
- Join us April 12<sup>th</sup> for Solutions Forum!



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PROCESSING FOOD SUSTAINABLY

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