



# Mobilizing Sustainable Consumption: Gamification and Innovations in Food Waste Awareness Campaigns

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# Food waste: A global problem

- Food waste and climate change via methane generation (25 times more potent than  $\text{CO}_2$ )
- If food waste was a country, it would be the third largest emitter of GHG gas after U.S and China
- \$49 Billion food wasted annually in Canada
- 1 in 8 households are food insecure –approx. 4 million Canadians (PROOF, 2017)



Photo Source: waste 360

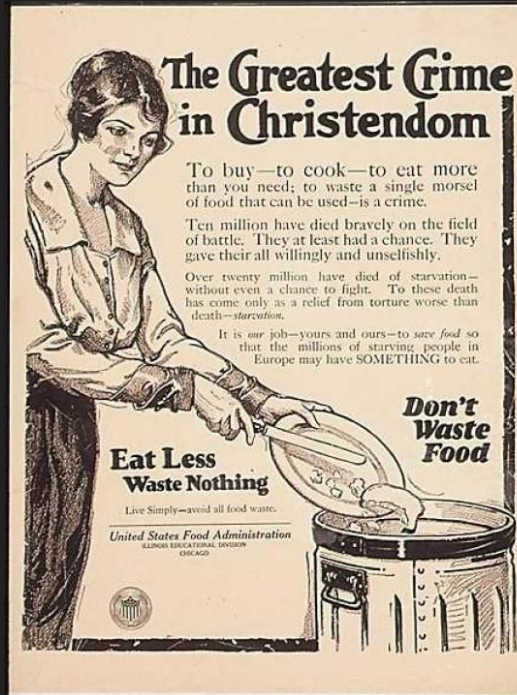
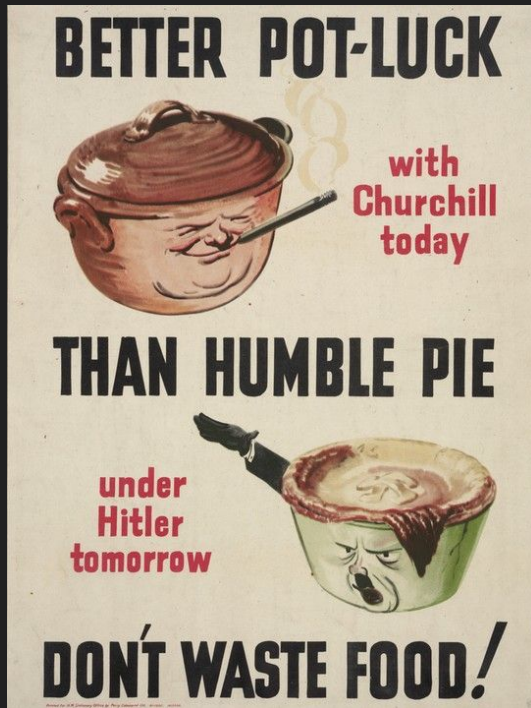
The background of the slide is split horizontally. The top half is a teal color with a fine, diagonal hatching pattern. The bottom half is a solid black color. A jagged, white line separates the two sections, resembling a torn piece of paper or a stylized horizon.

So how can we address this problem?



# Awareness campaigns/social marketing to promote environmental action (Maibach, 1993) or pro-environmental behavior (Allen & Ferrand, 1999)

## Historical food waste campaigns...



# Proliferation of Modern Food waste Awareness Campaigns



U.K, Canada (Vancouver, Toronto, Victoria, Montreal), Australia, New Zealand and more....



# Innovative and Quirky ads

## CHICKEN LOVERS hate waste

*"I'd be lost without chicken. It's such a staple to me and I can't bring any leftovers for up to two days in the fridge. And, I know, when I haven't cooked, I eat it as one small chicken and freeze it. That way it defrosts in no time. Then, if I need a quick dinner, I'll know it's in there. Truly."*

[lovefoodeatwaste.com](http://lovefoodeatwaste.com) has more tips and recipes to help you waste less food and save up to £30 a month.



LOVE  
FOOD  
hate waste

## BROCCOLI LOVERS hate waste

*"Broccoli is the only green thing I eat. Just ask Mum. I love it with cheese sauce, in curries, whatever. We always have some in the fridge. Well wrapped up, so it doesn't go with the them."*

Whatever food you love, we can help you waste less and save up to £30 a month at [lovefoodeatwaste.com](http://lovefoodeatwaste.com)

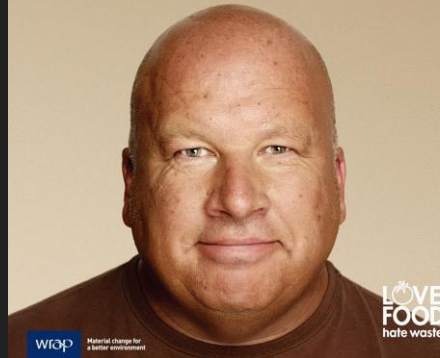


LOVE  
FOOD  
hate waste

## POTATO LOVERS hate waste

*"I love spuds. So I store mine in a cool dark place to make them last longer. If they've gone sprouty, after a proper peel they're ready to mash. And I always like freezing any leftovers in bags for a quick and easy shepherd's pie topping. Lovely jobby."*

[lovefoodeatwaste.com](http://lovefoodeatwaste.com) has more tips and recipes to help you waste less food and save up to £30 a month.



LOVE  
FOOD  
hate waste

## APPLE LOVERS hate waste

*"Apples are simply my favourite fruit. I always put them in the fridge as they last longer. After a good good, some bruised ones make an amazing smoothie. Or I use them to make apple pie and perhaps the most delicious smoothie. And I can enjoy them too!"*

[lovefoodeatwaste.com](http://lovefoodeatwaste.com) has more tips and recipes to help you waste less food and save up to £30 a month.



LOVE  
FOOD  
hate waste

# Innovative and Quirky ads

## CHICKEN LOVERS hate waste

I'd be lost without chicken. It's such a staple to me and I can't bring any leftovers for up to two days in the fridge. And, I know, when I haven't cooked, I eat it in tiny small chunks and freeze it. That way it defrosts in no time. Then, if I need a quick dinner, I'll know it's just a snap. Truly.

[lovefoodhatewaste.com](http://lovefoodhatewaste.com) has more tips and recipes to help you waste less food and save up to £50 a month.



LOVE  
FOOD  
hate waste

## BROCCOLI LOVERS hate waste

Broccoli is the only green thing I eat. Just ask Mum. I have it with cheese sauce, in curries, whatever. We always have some in the fridge. Well wrapped up, so it doesn't go soft like Mum.

Whatever food you love, we can help you waste less and save up to £50 a month at [lovefoodhatewaste.com](http://lovefoodhatewaste.com)

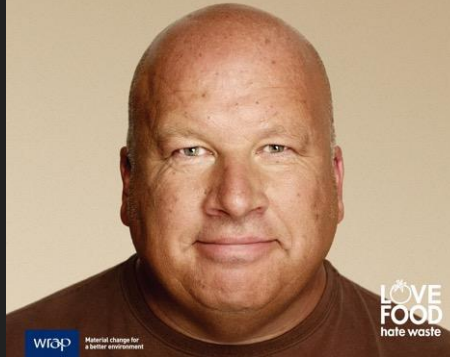


LOVE  
FOOD  
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## POTATO LOVERS hate waste

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WRAP  
Material change for  
a better environment

LOVE  
FOOD  
hate waste

## WRAP LOVERS hate waste



# Is it effective?

News > UK > UK Politics

## How the UK's household food waste problem is getting worse

As many as 8.4 million families in the UK struggle to put food on the table – and yet, 7.3 million tonnes of food waste ends up in landfills each year. Hazel Sheffield looks at how the food industry can help achieve the food waste goals the Government has missed

Hazel Sheffield | Tuesday 10 January 2017 20:13 | 2 comments



## Rotten results: Sainsbury's drops project to halve food waste

Residents in Derbyshire pilot town cut waste by only 9% despite free gadgets and tools



▲ Britons throw away on average about £700 worth of food each year. Photograph: Everyday Images / Alamy/Alamy

Sainsbury's has abandoned a £10m project to halve food waste in a designated town across Britain after a year-long trial produced miserable results.



# Research Questions

1. How can we better measure the efficacy of different types of food waste awareness campaigns?
2. What types of innovations and interventions can be integrated into food waste awareness campaigns to move people to action?

Objective: to ensure that government, businesses and civil society organizations spend their funds effectively on efforts that result in the desired social and environmental impact

# Participants: City of Toronto

## Duration: August 2018- March 2019



# Participant groups

Households Recruited (n= 500)

- Control + 3 Interventions
  - Information Only
  - Information + Community Workshop
  - Information + Online Game
- Interventions from August to November 2018 (12 weeks)

Group	Multi-Family	Single Family
Control	58	61
Information Only	90	50
Information + Community Workshop	60	59
Information + Online Game	60	62



# Methodology: August 2018- March 2019

2 waste audits (August & November) and 3 surveys (pre-campaign, post-campaign, and 12 weeks after intervention), focus group 12 weeks post intervention in February.



# Informational Campaigns

All interventions receive the following materials:

- Booklet
- Fridge magnet
- 4 newsletters via email or mail (approx. once every 3 weeks)



# Fridge Magnet

## Fridge Magnet

Applies to:



Control



Information Only



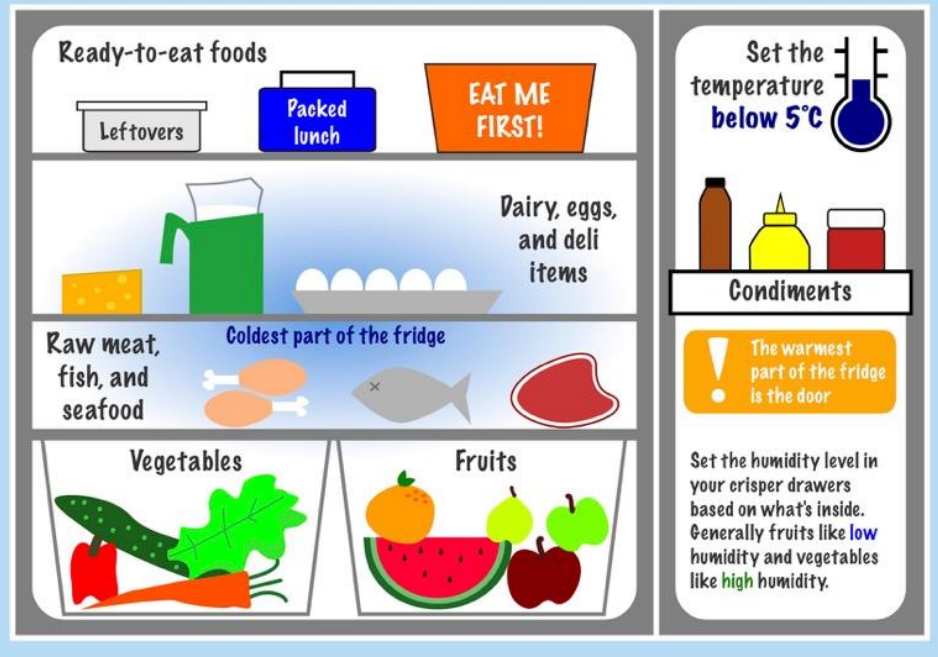
Information + Community

Workshop



Information + Online Game

Want your food to stay fresh for longer? Organize your fridge!





# Newsletters (4 in total)

Applies to:

- ☒ Control
- ☒ Information Only
- ☒ Information + Community Workshop
- ☒ Information + Online Game

## Tips for the Kitchen

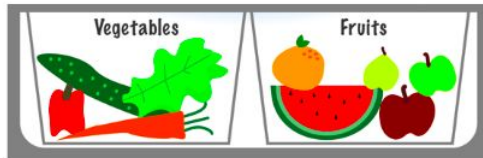
### Newsletter #2: Keep It Fresh



This is the second of four newsletters with tips on reducing food waste at home.

The theme for the second newsletter is **food storage**. Try these simple tips to make your food stay fresher for longer in your fridge and freezer.

#### 1. Use Your Crisper Drawers



Adjust levers on crisper drawers to change humidity levels. Set one to high (closed - less air coming in) and one to low (open - more air coming in). Vegetables are better stored at higher humidity levels and fruits at lower humidity levels but there are exceptions. Some fruits and vegetables like bananas and apples produce a gas called ethylene, which accelerates the ripening process. Keep ethylene-producing fruits and vegetables separate from other items in the fridge to prevent them from ripening too quickly. Check out this [produce storage guide](#) with specific storage tips for common fruits and

## Recipe Ideas

### Recipe Tips: Too Much Rice!

Rice is one of those foods where it is easier to cook a large amount at a time. As a rule of thumb, use 1/3 to 1/2 cup uncooked rice per person. Make a big batch, then refrigerate within a few hours to prevent spoilage. What should you do with the leftovers? Try these delicious ideas:



#### Rice Crust Pizza

Since old rice tends to be sticky it can be easily pressed into an oiled pan and covered with pizza ingredients and baked to make a crusty gluten-free pizza. If you used whole grain rice that isn't naturally sticky, mix in one egg, a bit of cheese or coconut milk to help bind it.



#### Onigiri

Onigiri is a Japanese rice ball that is great as a lunch or snack. Add any leftover roasted vegetables, or cooked fish or meat into a handful of rice and fold in a nori dried seaweed sheet (sushi roll).

# What worked and what didn't? (Informational Campaign)

## Nudge

*I think there was probably a small change. Largely because having these studies come up every once in awhile made me become more mindful of it. Also, I find that I share more of my food, my leftovers, with my neighbours and stuff... (Clinton)*

## Managing Diverse Family Expectations

*....when I was living alone. To be honest, I would always go to the grocery store and get the exact same thing, every week or whatever. Now integrating the habits of 2 people into 1 household has taken some adapting to. Obviously there's room for flexibility, but you both enjoy different things and stuff like that... (Jibran)*

# Community Engagement Workshops: 4 workshops





# What worked and what didn't

## Busy

*Yeah I remember I saw that email, but I'm doing my BA and I said no way because of the timing,. Now that you ask the question, if it was recorded like in a short online course it would definitely be something that I would watch maybe during the weekend like 10 minutes.... (Gabriela)*

## Information Fatigue

*yeah I'd say maybe just there was a lot of education materials and that was like so much information to sort through, and I kind of tuned out the emails to be honest. Like I get a lot of emails... (Grace)*

**\*names are pseudonym**

# Potential Innovation in Awareness: Gamification for Sustainable Consumption

Gamifying is about the application of game elements in non-game contexts (Deterding et al., 2011).

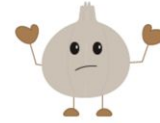
- Allows for recognition/ badges
- Allows for the tracking of progress & points
- Allows for instant feedback
- While early studies have shown changes in practices after playing games, there might be the issue of backsliding (Morganti et al., 2017)
- Over 1 billion people play games (Morganti et al., 2017)
- Johnson et al (2016). Found 59% of gamified interventions showing positive effects.



# Online Game

- One level per week for 12 weeks
- 5 trivia questions per level
- Earn 10 points per level completed
- \$10 gift card for 60 points, \$20 gift card for 120 points
- Approx. 50% of participants play each week

Question 2/5



How can I get more organized to reduce the amount of food that I intend to eat, but gets lost in the shuffle?

Buy on-sale grocery items at the store

Buy ugly fruits and veggies

Keep an 'eat-me-first' basket or shelf in your fridge

Eat out more

Question 5/5



If we work together to reduce food waste from households in Canada, the reduction of greenhouse gases is equivalent to taking approximately how many cars off the road each year?

250,000

500,000

1 million

2 million



# What worked and what didn't

## Easy to do

*...the gamification, it's quick, it doesn't take much of your time at all but it is very engaging. Whereas like, you know, maybe a group where you have to go out to the group sometimes even if you think, oh, I'm going to do that on Tuesday and whatever, it's kind of easy for something to come up and get in the way.....but this [gamification] is easy to put into anyone's schedule just because it takes such a short amount of time and it was very engaging. And then yeah, once you start doing it, it does make you think about things more than you think. (Susan)*

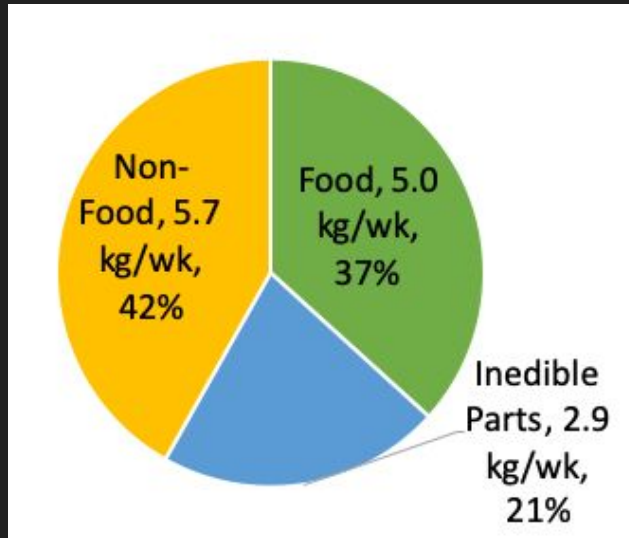
## Too simple

*The way of approaching the game was very simple. So..I liked the methodology, the content...Sometimes, for me, it was too simple, so I just skip it..I expected to know more. (May)*

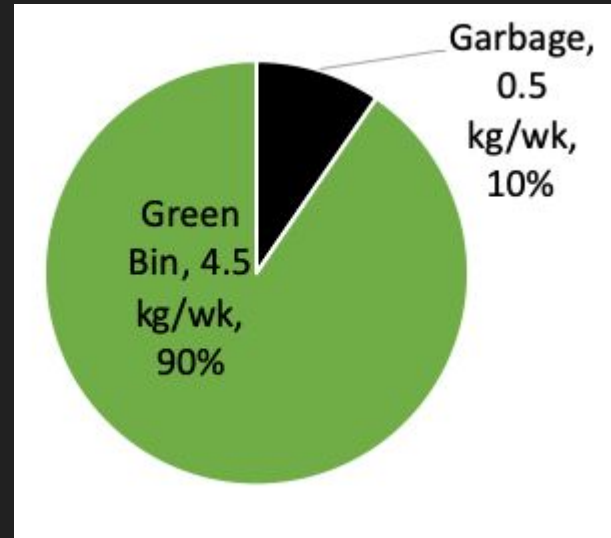
# Findings from Waste Audits and Surveys

# Food wasted per week in single family households

Average amount wasted per week

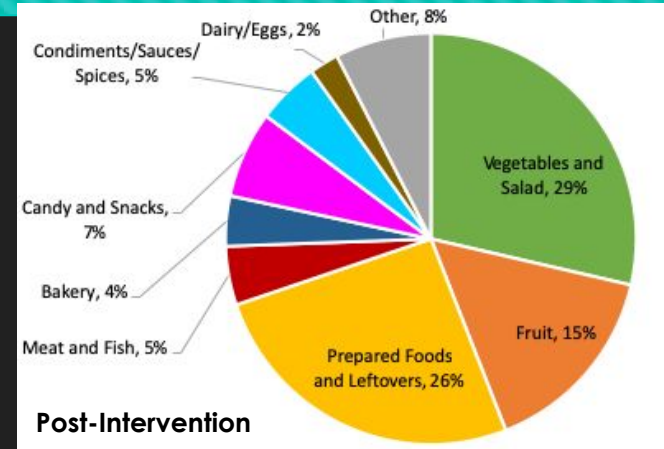
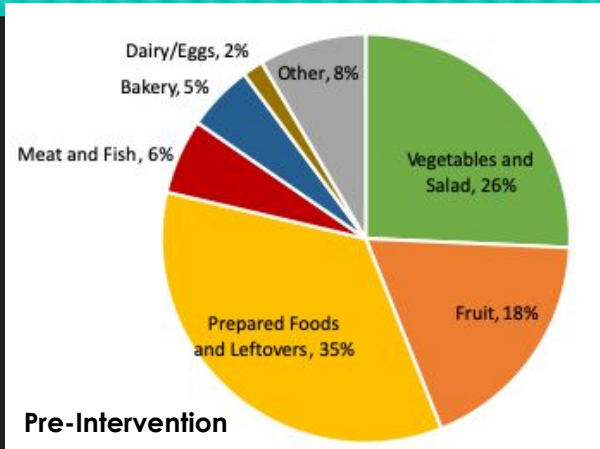


Where edible food waste is thrown out

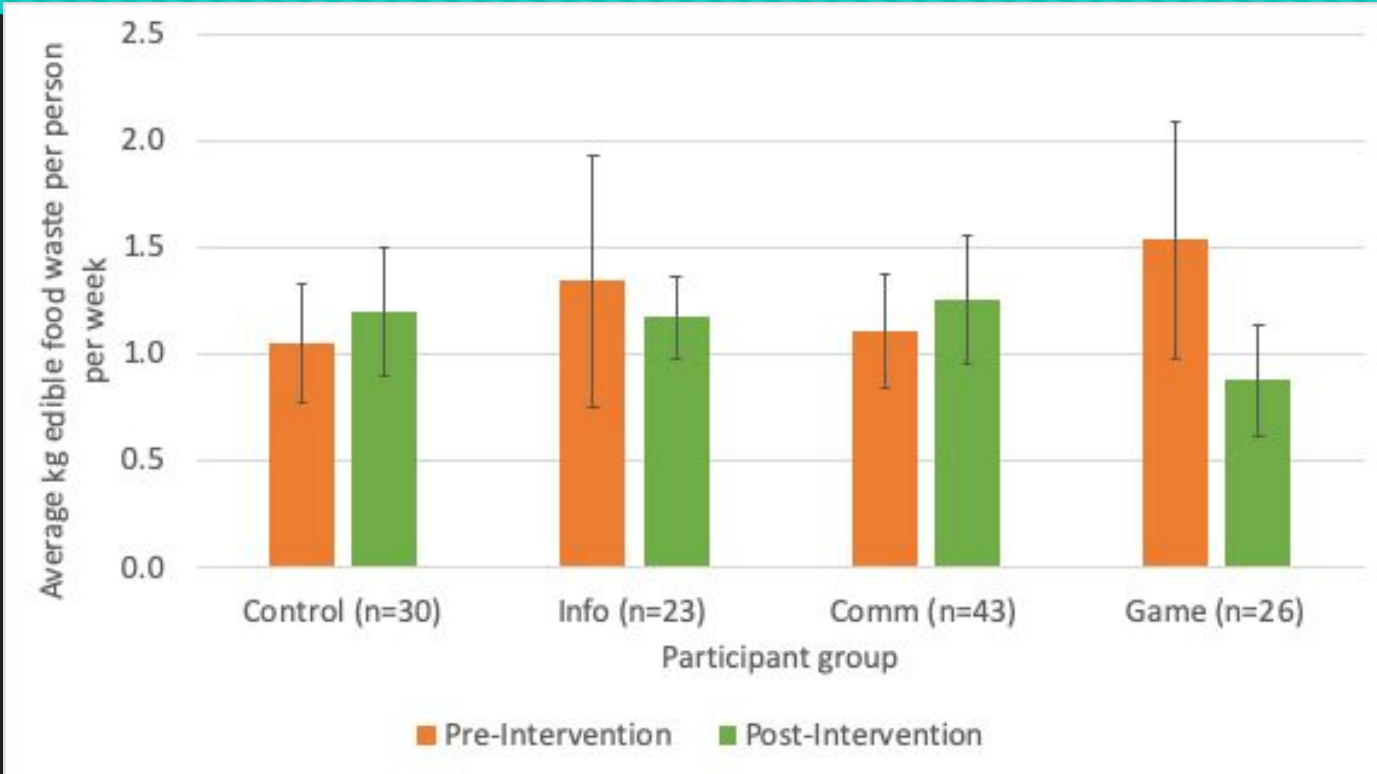




# Edible Food Waste Composition



# Comparison of Waste Audit Results



# Surveys corroborate waste audits!

## Food Waste Decreased

69% in Gamification Group  
51% in Other Groups

Chi Square Test Result:  
 $p=0.0069$

## Awareness Increased

81% in Gamification Group  
62% in Other Groups

Chi Square Test Result:  
 $p=0.0065$



# Points to Consider

- From a practice theory perspective, how can we disrupt everyday practices to normalize food waste prevention and reduction-one potential is nudging via game reminders+ points system (Theory of Nudging – Thaler and Sunstein, 2009)
- At the supermarket level, the context of nudging to increase purchases/ or to buy the chips and snacks, needs to be shifted to nudge people to buy only as they need (BOGO -BOGOL), or to transform supermarket layout

# Thank you!

This study is funded by the  
Weston Foundation

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To learn more visit:

[foodsystemslab.ca](http://foodsystemslab.ca)

