



Reducing Commercial Food Waste in Europe

November 2025

Tools of Change Illustrated

- ▶ Feedback
- ▶ Overcoming Specific Barriers
- ▶ Vivid, Personalized, Credible, Empowering Communication

Location

- ▶ Germany, Greece, Switzerland

Initiated by

- ▶ LOWINFOOD project team

Partners

- ▶ KITRO S.A.
- ▶ European Union's Horizon 2020 Research and Innovation programme

Results

- ▶ Reduced food waste at four of the intervention locations by 23- 51%
- ▶ Cut the cost of wasted food by up to 39%

Introduction

Providing kitchen managers and staff with personalized feedback on the amount and types of food being wasted has been shown to reduce the amount of food wasted. However, existing food waste tracking systems took time and disrupted workflows - a significant barrier to long-term adherence. This intervention used a newly developed, fully automated food waste tracking system to reduce this barrier by automatically weighing and recognizing food waste items and categories. It reduced food waste at four of five locations by 23 to 51% and cut the cost of wasted food by up to 39%. This was largely due to changes to how meals were produced and served.

Background

The managers of this intervention were aware of the high environmental, social, and economic costs of food waste.

Environmental

- Increased greenhouse gas emissions, including methane emissions from food waste disposal in landfills
- Overexploitation of natural resources
- Excessive fertilizer applications, and loss of biodiversity

Social and Economic

- Corresponding financial, investment, and income losses
- Higher food prices
- Macro- and micronutrients, as well as bioactive compounds embedded in the food matrix, are discarded while food

insecurity affects one-third of the world's population

- Lower labor productivity, hindered social development, social inequalities, and a higher prevalence of poverty

The commercial foodservice sector in particular has been recognized as an “*unsustainability hotspot*.” While waste is created throughout the food supply chain, the most powerful point of intervention is where the food is prepared and served because it combines inputs from all the previous stages.

Past interventions had demonstrated that providing kitchen managers and staff with personalized feedback on the amount and types of food being wasted could raise their awareness of the issue and foster behavior changes that reduced the amount of food wasted. However, the manual and semi-automatic food waste tracking systems used in most programs required additional effort and workload to weigh and categorize the food waste items, and that disrupted workflows. This was a significant barrier to long-term adherence.

Newly developed, fully automated food waste tracking systems had the potential to reduce this barrier. They used artificial intelligence (AI) to automatically weigh and recognize food waste items and categories.

To explore the impact across different contextual and geographic settings, the intervention was implemented at (1) a restaurant within a holiday resort in Germany, (2) a business caterer in Germany, (3) a hotel in Switzerland, and (4,5) two hotels in Greece.

Getting Informed

The intervention planning team conducted semi-structured interviews with the managers of each participating establishment to learn about their motives, readiness, and expectations.

They also determined country-specific market prices for food items, for use in the system's cost calculations. These were adjusted when prices changed during implementation.

At baseline, total food waste at the intervention locations ranged from 76 to 152 grams per meal. 45 -73% of this waste was classified as ‘avoidable’.

Prioritizing Audiences

This program was designed for Kitchen managers and staff in the European Hotel, Restaurant, and Catering (HoReCa) industry.

Delivering the Program

A new fully automated waste-tracking system was installed at each location during the baseline stage. During the intervention stage, these systems supported the kitchen managers and staff with the following three kinds of personalized feedback on their food waste. (*Feedback; Vivid, Personalized, Credible, Empowering Communication.*)

1. Automatically produced reports
2. An online data dashboard enabled real-time monitoring and analysis of the data recorded
3. Regular goal-setting meetings to discuss the findings, adjust reduction targets, and develop tailored prevention actions

Users said this gave them a clear daily understanding of the food waste hot spots and sources, took minimal effort and time to use, and was cost-effective considering the final savings.

The following table summarizes the key barriers to action and how each was addressed. (*Overcoming Specific Barriers*)

Barrier	How it was addressed
Lack of awareness and engagement	• Feedback • Vivid, Personalized, Credible, Empowering Communications
The manual and semi-automatic food waste tracking systems used in most programs required additional effort and workload, and disrupted workflows. This was a significant barrier to long-term adherence.	• New fully automated system

Measuring Achievements

The waste-tracking systems were installed at the baseline stage and provided food waste data immediately. However, managers and staff did not see this information until the implementation stage.

After the implementation period, the intervention team conducted semi-structured interviews with the kitchen managers to explore which goals were accomplished, user experiences, and difficulties encountered. These interviews also helped them evaluate intervention impacts.

Providing Feedback

Kitchen managers and staff received three kinds of personalized feedback on their food waste.

1. Automatically produced reports
2. An online data dashboard enabled real-time monitoring and analysis of the data recorded
3. Regular goal-setting meetings to discuss the findings, adjust reduction targets, and develop tailored prevention actions

Results

- The intervention improved awareness of food waste that fostered the following waste prevention actions.
 - Preparing and serving less food
 - Preparing food on demand and restocking it regularly at buffets
 - Adjusting menu offerings and portion sizes
 - Improving food storage habits
 - Giving uneaten food to staff
- The intervention reduced food waste at four of the intervention locations by 23-51%, and cut the cost of wasted food by up to 39%. This was largely due to changes to how meals were produced and served. – stages at which the kitchen managers and staff had the most influence. The greatest reductions were for fruits.
- Avoidable plate waste was largely influenced by consumer behaviors, and it was only reduced at one facility.
- One of the intervention sites saw a 13% increase in food waste, two thirds of which was due to ‘unavoidable’ waste. This was mostly due to external factors, such as the COVID pandemic, and low motivation of managers and staff.

Lessons Learned

- Artificial Intelligence (AI) can be used to provide feedback and Vivid, Personalized, Credible, Empowering Communications that overcome lack of awareness, inertia, and time and effort barriers.
- This intervention was more effective in reducing preparation food waste and overproduction. For maximum impact, it should be paired with a campaign targeting the customers of these kitchens to reduce their plate waste.

Notes

- This case study is based on the first peer-reviewed report of the use of a fully

automated food screening system to reduce food waste.

- The intervention had the greatest impact on lowering food waste at the site with the greatest number of tailored measures.
- The following are a few examples of how AI could use visual data to provide personalized feedback for otherwise hard-to-monitor and manage behaviors.
 - Flood management programs could use AI to review aerial images to provide feedback on (1) real time flooding information (2) floodproofing actions taken and (3) floodproofing actions yet-to-be taken
 - Biodiversity programs could use AI to review aerial images and provide feedback on biodiversity, actions taken, and yet-to-be taken actions.
 - Waste reduction programs could use a similar approach for other waste categories (beyond food waste)

For More Information

Reducing food waste in the HORECA sector using AI-based waste-tracking devices.

<https://www.sciencedirect.com/science/article/pii/S0956053X25001072>

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For step-by step instructions in using each of the tools noted above, to review our FULL collection of over 240 social marketing case studies, or to suggest a new case study, go to www.toolsofchange.com

This case study is also available online at <http://www.toolsofchange.com/en/case-studies/detail/773>

It was compiled in 2025 by Jay Kassirer based on information provided in the above reports.

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